TOJET
The Turkish Online Journal of Educational Technology

ISSN 2146-7242

Turkish Online Journal of Educational Technology

Volume 15, Issue 2
April 2016

TOJET
01.04.2016

THE TURKISH ONLINE JOURNAL OF EDUCATIONAL TECHNOLOGY

April 2016
Volume 15 – Issue 2

ISSN: 2146 - 7242

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

Published in TURKEY

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Editorial Board

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Attitudes of Turkish EFL Student Teachers towards Technology Use

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ABSTRACT
The hot debate of integrating technology into instruction has captured the interest of the world in the context of 21st century education. A considerable amount of effort has been presented in order to incorporate technology into education. In this respect, attitudes have been considered as a good indicator of the tendency to implement technology into instruction. Therefore, the aim of this study is to investigate the attitudes of Turkish English as a foreign language (EFL) student teachers at a major state university in Turkey towards technology use in language learning and teaching. Using a mixed methods approach, 98 student teachers participated in the study. The attitude towards technology scale developed by Yavuz (2005) and focus group interview were used to collect data from the participants. The findings indicate that the student teachers have highly positive attitudes towards the use of technology in language learning and teaching. Some pedagogical implications and suggestions for student teachers, teacher trainers and schools were provided for future development.

Keywords: Attitude towards technology use, ICT, EFL, Student teachers

INTRODUCTION
It cannot be denied that development of technology has had an impact on nearly every field including education (Isman & Dabaj, 2004; Mishra, & Koehler, 2006; Özdamlı, Hürsen, & Özçinar, 2009; Yavuz, 2005; Woodrow, 1987). What is more, foreign language learning and teaching has become one of the areas in which hot debates towards technology can be felt. Therefore, language learning and teaching via technology is gaining more and more importance (Albirini, 2006; Almekhlafi & Almeqdadi, 2010; Dang, 2011; Dogoriti, 2010; Kopinska, 2013; Liu, 2009; Raman & Yamat, 2014; Tsou, Wang, & Tzeng, 2006; Warschauer, 1997). It has been found in the research that one of the important factors influencing the perspectives towards technology is the attitude (Ertmer, Paul, Molly, Eva, & Denise, 1999; Fabry & Higgs, 1997; Myers & Halpin, 2002; Tondeur, Valcke, & van Braak, 2008; van Braak, Tondeur, & Valcke, 2004; Yavuz, 2005) in so much as attitude is an important variable whether the teachers will make use of technology in their instruction.

Gardner (1985, pp. 91-93) defines attitude as "an evaluative reaction to some referent or object, inferred on the basis of the individual's beliefs or opinions about the referent". According to social psychologists, attitudes include three components: "a cognitive component, an affective component, and a behavioral component" (Nolen-Hoeksema, Fredrickson, Loftus, & Wagenaar, 2009, p. 662). It can be exemplified as:

> "We often express our attitudes in statements of opinion: 'I love grapefruit' or 'I can't stand liberals.' But even though attitudes express feelings, they are often linked to cognitions – specifically, to beliefs about the attitude objects ('Grapefruit contain lots of vitamin C' or 'Liberals just want to tax and spend'). Moreover, attitudes are sometimes linked to the actions we take with respect to the attitude objects ('I eat a grapefruit every morning' or 'I never vote for liberal candidates')" (Nolen-Hoeksema et al., 2009, p. 662).

Regarding this, it was revealed in the studies that EFL learners and teachers have positive attitudes toward the use of technology (Başaran, 2013; Isman & Dabaj, 2004; Kitchakarn, 2015; Liton, 2015; Liu, 2009; Mollaei & Riasati, 2013; Uluuysal, Demiral, Kurt, & Şahin, 2014). Moreover, the findings indicate that EFL teachers had positive views towards the incorporation of technology into language learning and teaching (Aydin, 2013; Sağlam & Sert, 2012; Uluuysal et al., 2014). Besides, it was found in the studies that student teachers have positive attitudes towards technology (Alkan & Erdem, 2010; Hismanoglu & Hismanoglu, 2011; Kuo, 2008; Yüksel & Kavanoz, 2011). It has been revealed in the studies that teacher attitudes towards technology form the basis of their tendency to integrate technology into instruction (Abas, 1995; Beggs, 2000; Blankenship, 1998; Bullock, 2004; Davis, 1989; Francis, Katz, & Jones, 2000; Huang & Liaw, 2005; Isleem, 2003; Kersaint, Hornton, Stohl, & Garofalo, 2003; Mumtaz, 2000; Myers & Halpin, 2002; Tondeur et al., 2008; van Braak *et al*.,

2004) because if the teachers do not feel themselves ready for using technology, they may not volunteer to implement it in their instruction. It can be said that in order for teachers to feel ready, it may be crucial for them to develop positive user attitudes towards the technology (Alkan & Erdem, 2010; Isman & Dabaj, 2004; Liton, 2015; Woodrow, 1987). Hence, studies show that the attitudes of the learners towards technology should be revealed (Akbaba, 2001; Becker & Maunsaiyat, 2002; Christensen & Knezek, 2000; Gunter, Gunter, & Wiens, 1998; Isman & Dabaj, 2004; McCoy, Heafner, Burdick, & Nagle, 2001; Mitra, 2001; Selwyn, 1997; Tanguma, Martin, & Crawford, 2002; Tsai, Lin, & Tsai, 2001; Vicario, Henniger, Austin & Chamblies, 2002; Yavuz, 2005). Therefore, student teachers should be given opportunities to incorporate technology into their teaching and learning style and to improve their positive attitudes towards using technology in education (Alkan & Erdem, 2010; Teo, 2008).

METHODOLOGY

Research Design

The purpose of this study is to reveal the attitudes of Turkish EFL student teachers towards technology use in language learning and teaching. Mixed-methods approach combining both quantitative and qualitative methods was used in order to "provide a more complete understanding of research problems than does the use of either approach alone and find out the relationships between variables in depth" (Fraenkel, Wallen, & Hyun, 2011, pp. 557-558). Therefore, the research question of the study can be viewed below:

1. What are the attitudes of Turkish EFL student teachers towards technology use in language learning and teaching?

Participants

The participants were selected from a major state university in the department of ELT in Turkey. Convenience sampling, a common non-random way of choosing sample, was used because "members of the target population are selected for the purpose of the study if they meet practical criteria, such as … availability at a certain time, easy accessibility, or the willingness to volunteer" (Dörnyei, 2007, pp. 98-99). As can be seen in table 1, 82 female (85.4%) and 14 male (14.6%) Student teachers participated in the study. 2 student teachers did not clarify their gender. Therefore, 98 student teachers took part in the study.

Table 1. Participant profile

Gender	Frequency	Percentage
Female	82	85.4%
Male	14	14.6%
Missing	2	-
Total	98	100

Data Collection Instruments

Being voluntary was taken into consideration in filling the scale. The participants were requested to sign the approved consent form that expresses the aim of the study, open address and phone number of the researcher, and confidentiality of the data and the name of the participants. For the quantitative part, *the scale of attitude towards technology* by Yavuz (2005) was chosen (see Appendix A). *The scale of attitude towards technology* includes 19 items with 5 factors, namely not using technological tools in education, using technological tools in education, the effects of technology on educational life, teaching how to use the technological tools and evaluating technological tools. The Crombach's alpha of the instrument is 0.8668. For the qualitative part, a focus group interview, composed of 8 participants who were voluntary, was conducted with a semi-structured interview. The interview was carried out in Turkish in order to obtain more in-depth data. The participants were asked 'What are your opinions and attitudes towards the use of technology in English language learning and teaching?'.

Data Analysis

The descriptive statistics, namely frequency and percentage, was used to analyze the attitude scale. The participants were asked whether it was okay for them to record the speech for the transcription of the data before starting the interview. Also, they were assured that they would be given pseudonyms in the analysis. The interview lasted for approximately 7 minutes. Interpretive approach was used to analyze the data obtained from the focus group interview. Content analysis was used in order to analyze the written transcriptions because "it is extremely valuable in analyzing interview data" (Fraenkel et al., 2011, p. 479). Themes were formed and the quotations were given under each category.

FINDINGS

Findings of the scale

This study investigates the attitudes of Turkish EFL student teachers towards technology use in language learning and teaching. The descriptive statistics of the attitude scale can be seen in the table 2.

Table 2. Frequency and percentage of the items

Item No	n	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
		f	%	f	%	f	%	f	%	f	%
Item 1	98	47	48	47	48	1	1	2	2	1	1
Item 2	96	31	31.6	55	56.1	8	8.2	1	1	1	1
Item 3	98	55	56.1	38	38.8	3	3.1	2	2		-
Item 4	97	48	49	42	42.9	6	6.1	1	1		-
Item 5	92	27	27.6	46	46.9	13	13.3	5	5.1	1	1
Item 6	97		-	8	8.2	9	9.2	56	57.1	24	24.5
Item 7	98		-	6	6.1	3	3.1	56	57.1	33	33.7
Item 8	98	1	1	4	4.1	3	3.1	59	60.2	31	31.6
Item 9	97		-	6	6.1	13	13.3	56	57.1	22	22.4
Item 10	97	1	1	3	3.1	4	4.1	66	67.3	23	23.5
Item 11	98	2	2	2	2	2	2	57	58.2	35	35.7
Item 12	98		-	2	2	5	5.1	60	61.2	31	31.6
Item 13	96	2	2	26	26.5	41	41.8	22	22.4	5	5.1
Item 14	98		-	4	4.1	22	22.4	64	65.3	8	8.2
Item 15	97		-	5	5.1	21	21.4	61	62.2	10	10.2
Item 16	97		-	3	3.1	7	7.1	71	72.4	16	16.3
Item 17	96		-	2	2	2	2	61	62.2	31	31.6
Item 18	98	11	11.2	39	39.8	35	35.7	12	12.2	1	1
Item 19	98	1	1	4	4.1	24	24.5	48	49	21	21.4

It can be understood from the findings that 96 % of the student teachers disagree with the idea that “e-mail is only for communication; it cannot be used in education”. In addition, 87.7 % of them do not agree that “OHP, slides and projection should not be preferred as they take too much time to be used”. Moreover, it can be deduced from the findings that 95.9 % of them are opposed to the notion “using the Internet in the learning process is a waste of time”. Furthermore, 91.9 % of them disagree with the statement that “using technological tools does not affect students’ motivation”. What is more, the findings show that 76.5% of them are opposed to the notion “technological tools do not need to be used in instruction”. Lastly, 51% of them disagree with the statement that “technological tools could only succeed when they address all the sense organs”.

It was revealed in the findings that 81.6% of the student teachers agree with the statement that “recording some parts of the lesson on videotapes could provide the students the opportunity to see their mistakes”. What is more, 90.6% of them approve that “because the videotapes could be watched again, students could get feedback”. Furthermore, 91.8% of them acknowledge the idea that “technological tools could be used for practice or revision”. Besides, 79.5% of them agree “students should receive basic education on computer literacy”. In addition, 90.8% of them stand for the statement “using current technologies would promote the improvement of new ones”. Moreover, 93.9% of them approve that “technological facilities have a positive effect on productive studying and learning”. What is more, 92.8% of them agree “using technology would facilitate the understanding of difficult subjects”. Furthermore, 73.5% of them acknowledge that “daily and yearly plans should be prepared by teachers using computers”. Besides, 72.2% of them agree “lessons should often include computer-assisted instruction”. In addition, 88.7% of them stand for the notion “students should get advance information on the usage of new technologies”. Moreover, 93.8% of them approve the statement “the usage of new technologies in teacher training should be increased”. Lastly, 70.4% of them agree “in order to be able to graduate from the university, the ability to “use the technological materials of the field” should be rated”. One last thing is that 41.8% of them feel undecided about the item “one does not have to use technological facilities in order to be successful in life”.

The findings of the table 3 indicate student teachers see themselves advanced (52%) and average (42.9%) in terms of their perceived technology level. It is just 2% of them assuming their perceived technology level as basic.

Table 3. Perceived technology level

Perceived Technology Level	n	Basic		Average		Advanced	
		f	%	f	%	f	%
	95	2	2	42	42.9	51	52

Findings of the interview

Learner Engagement:

It can be drawn from the interview that the student teachers think technology attracts the attention of the learners.

P3: Actually, the learners are so used to technology that nothing gets their attention. Immediately after you say mobile phone or computer, you can get the whole attention. But, you cannot attract the learners' attention by other things.
P2: Pieces of paper do not get their attention but a paper projected attracts their attention more.
P1: I can directly bring USB and connect it to the smart board. We have to carry computers here to do that. We directly prepare our presentation there and it makes the lesson more effective.
P6: It is very important to use visual materials for speaking but not listening for my group. The children give importance to that and if there is no visual material, they certainly do not attend to the lesson and are not interested.
P7: Because their teachers are old-generation and they do not teach in an enjoyable way, they are listening to us more carefully.

Convenience of the technology:

Student teachers in this study think that technology gives them practicality.

P1: I am very positive towards the use of technology in language learning and teaching because we use smart board in 'young learners' courses or practicum. For example, we just click the play button for listening songs and they can listen to it 2 or 3 times. Besides, it is very convenient in such activities as watching video and playing games. Before, there were cassettes, but now it is better.
P2: I forgot to download the song last week in the practicum. Due to the fact that there are smart boards with Internet, we could listen to the song. It took just 1 or 2 minutes. Therefore, we did not lose so much time.
P1: The learners are very accustomed to the smart board. Therefore, it is such a convenience.

Time-saving:

Student teachers think that technology is a timesaving tool.

P1: Technology saves time and we even use the exam papers from there (smart board).
P2: I think that if we can use it appropriately, it is saving anyway.

Technical problems:

Student teachers explain that although they emphasize they really like using technology, they think there are some bad sides, too. One of them is the technical problems they encountered.

P4: I think that it is generally useful. But once, while my friends were going to practicum, there was power cut. It was like locked.
P1: When there was a power outage, most of our friends' lessons were interrupted.

Making lazy & Addiction:

Student teachers assume that technology may make them and the learners lazy to some extent.

P4: If the teacher is unprepared, the lesson is completely blocked. And we cannot always go prepared. For example, it is not possible to bring a cassette in case the power is cut or I am preparing power point presentation and I used to use colorful cartons. Now, power point suits my book more. It is just not possible for me to prepare both colorful cartons and power point. Therefore, we are not always able to come prepared and when these kinds of malfunction occur, the whole lesson blows up in our face. In fact, our teacher said that we should have been prepared but too much preparation is not always possible. What is the point of preparing power point if we are to design colorful cartons?
P2: Technology is making us lazy. Besides, we started to live too much addicted.
P1: We are getting lazier because there are loaded books inside the smart board. For example, our topic is 'must'. There is certainly a song related to 'must'. However, before, we used to search for a song suitable for

'must', find a song from Google and investigate whether it is suitable or not. Now, we directly use the song thinking that we already have it. We are a bit taking the easy way out.
P1: The moment the learners see a small piece of paper, their attention is distracted. They have become so addicted to the smart boards that they even do not open the book. However, even if it makes us lazy, I cannot say that we do not like technology.

Abusement of the technology by the learners:
Student teachers claim that the learners sometimes abuse the technology.

P1: The learners look at the song lyrics in listening activities. Besides, I suppose it is okay to bring phones to the school because they all have phones in their hands. Technology has some difficulties for the teachers from this aspect.
P2-3: Once, I collected the phones.

Future School Anxiety:
Student teachers also seem to worry about their future schools in terms of its technical facilities.

P5: We are also worried about whether we falter if the school we are going to be assigned next year is so much technological like our practicum school.
P2: We experienced our practicum in a qualified school. We got accustomed to just inserting the flash storage and teaching the lesson. So next week, if we design cartons, we cannot use power point.

High Expectations of the Learners:
Student teachers think that the expectations of the learners are getting higher and higher with the technological developments.

P5: The expectations of the learners are increasing like what is the teacher going to do with all these facilities? Before, when they saw colorful cartos, their eyes used to sparkle. However, now, there is no such thing. Their expectations are very high and we are just trying to keep up with.
P1: When we teach the lesson straightly, they just feel sleepy.

DISCUSSION

1. What are the attitudes of Turkish EFL student teachers towards technology use in language learning and teaching?

It can be deduced from the findings that Turkish EFL student teachers in this study have positive attitudes towards the use of technology in language learning and teaching process. The findings of this study ally with the previous studies indicating positive attitudes (Alkan & Erdem, 2010; Başöz & Çubukçu, 2014; Chung, 2014; Cutrim Schmid & Hegelheimer, 2014; Hismanoglu, 2012; Hismanoglu & Hismanoglu, 2011; Savaş, 2012; Kuo, 2008; Özdamlı et al., 2009; Savas, 2014; Yüksel & Kavanoz, 2011). The student teachers prefer technology in language learning and teaching due to such features as its convenience (Isman & Dabaj, 20004), timesaving, and developing learner engagement (Caruso & Kvavik, 2005; Günüç & Kuzu, 2014). They express that although there are some negative sides of the technology like technical problems, making lazy, addiction (Isman & Dabaj, 20004), abusement by the learners, future school anxiety, and high expectations of the learners, they still like technology. Therefore, the student teachers in this study believe in the importance of technology in language learning and teaching and find it beneficial and seem to see technology inevitable for 21st century learning and teaching contexts (Isman & Dabaj, 2004). Besides, it supports the notion that feeling ready and competent in technology promotes the development of positive attitudes (Alkan & Erdem, 2010; Isman & Dabaj, 2004; Liton, 2015; Warschauer, 1998; Woodrow, 1987). Furthermore, it seems important to give learners opportunities to experience technology in real-life contexts (Albion, 1999; Teo, 2008; Wang, Ertmer, & Newby, 2004). Also, it can be said that they seem to use technology for their future career due to the fact that they have both positive attitudes towards the technology (Abas, 1995; Beggs; 2000; Blankenship, 1998; Bullock, 2004; Davis, 1989; Francis et al., 2000; Huang & Liaw, 2005; Isleem, 2003; Kersaint et al., 2003; Kuo, 2008; Mumtaz, 2000; Myers & Halpin, 2002; Tondeur et al., 2008; van Braak *et al*., 2004) and feel anxious what to do if they do not have access to the technology in their future assigned schools. However, they also feel anxious about failing to keep up with the technological innovations because of the rapid development and high learner expectations. *For now, technology is an advantage for us. But, we do not know what will happen tomorrow. It is enough, no more advancement.* Therefore, it seems crucial for these student teachers to have the knowledge of not only how to use technology especially with the new developments but also become aware of how to bring technology into their classrooms with the necessary equipment. Besides, there should be some precautions against the technology-related problems in the schools.

CONCLUSION

The aim of the study is to find out the attitudes of Turkish EFL student teachers towards technology use in language learning and teaching process. The findings show the student teachers have highly positive attitudes towards technology use in language learning and teaching. Also, it was revealed from the results that the student teachers seem positive towards the use of technology in language learning and teaching because of its convenience, time-saving feature, and improving learner engagement. They really find technology very effective in language learning and teaching. However, they also point out that there are such drawbacks as high learner expectations, future school anxiety, making lazy, addiction, abusement by the learners, and technical problems. No matter what the drawbacks are, the student teachers in this study seem to really favor the use of technology in language learning and teaching and seem to implement it in their future career.

PEDAGOGICAL IMPLICATIONS AND SUGGESTIONS

The findings of this study have some pedagogical implications and suggestions for student teachers, teacher trainers, and practicum schools. It was illustrated that student teachers in this study have positive attitudes towards technology use in language learning and teaching. It can be said that student teachers seem to keep with 21st century teacher profile promoting the use of technology and seeing it as time-saving and facilitating the learning. Their practicum experience seems to give them an opportunity to experience technology in real life context and this seems to have contributed to their development of positive attitudes. Besides, the learners' good reactions to the technology seem to promote their use of technology in the class. Therefore, there are some implications for the education from this study. Firstly, it seems important to make student teachers have real-life experience in terms of trying out technology implementation. The teacher education programs and teacher trainers should think about how to make it happen. Secondly, it may be a good idea to arrange a practicum school with technological facilities for student teachers. However, it seems that practicum schools may not have equipment dealing with the technical problems like power cut. Maybe, the schools should take steps to deal with these kinds of flaws taking into consideration that one day all schools will be equipped with technological tools. Thirdly, there seems a need for an in-service training program in terms of making knowledgeable those teachers about the technological innovations as can be seen in the anxiety of the student teachers, there is a possibility for those student teachers to let technology go in their classes due to failure to keep up with technological developments and lack of technological facilities. Therefore, they may need training both pedagogically as how to integrate new technological applications into their teaching and how to reach technological tools technically.

REFERENCES

Abas, Z. W. (1995). Implementation of computers in Malaysian schools: problems and successes. In D. Watson, & D. Tinsley (Eds.), *Integrating information technology into education* (pp. 151–158). London: Chapman & Hall.

Akbaba Altun, S. (2001). Elementary school principals' attitude towards technology and their computer experience. Retrieved April 12, 2015 from ERIC.

Albion, P. (1999). Self-efficacy beliefs as an indicator of teachers' preparedness for teaching with technology. *Proceedings of the 10th International Conference of the Society for Information Technology & Teacher Education*. Retrieved from http://eprints.usq.edu.au/6973/1/Albion_SITE_1999_AV.pdf.

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, *47*(4), 373-398.

Alkan, F., & Erdem, E. (2010). The attitudes of student teachers towards educational technologies according to their status of receiving teaching application lessons. *Procedia-Social and Behavioral Sciences*, *2*(2), 2523-2527.

Almekhlafi, A. G., & Almeqdadi, F. A. (2010). Teachers' perceptions of technology integration in the United Arab Emirates school classrooms. *Educational Technology & Society*, *13*(1), 165-175.

Aydin, S. (2013). Teachers' perceptions about the use of computers in EFL teaching and learning: the case of Turkey. *Computer Assisted Language Learning*, *26*(3), 214-233.

Basaran, B. C. (2013). Attitudes of EFL teachers and learners towards CALL in Turkey. *Proceedings of the International Conference ICT for Language Learning*. Retrieved from http://conference.pixel-online.net/ICT4LL2013/conferenceproceedings.php

Başöz, T., & Çubukçu, F. (2014). Pre-service EFL teacher's attitudes towards computer assisted language learning (CALL). *Procedia-Social and Behavioral Sciences*, *116*, 531-535.

Becker, K. H., & Maunsaiyat, S. (2002). Thai students' attitudes and concestudent teachers of technology. *Journal of Technology Education*, *13*(2), 6-19.

Beggs, T. A. (2000). Influences and barriers to the adoption of instructional technology. Retrieved May 9, 2015 from ERIC.

Blankenship, S. E. (1998). *Factors related to computer use by teachers in classroom instruction*. Unpublished doctoral dissertation. Department of Educational Administration, Virginia Polytechnic Institute and State University, Virginia.

Bullock, D. (2004). Moving from theory to practice: An examination of the factors that preservice teachers encounter as the attempt to gain experience teaching with technology during field placement experiences. *Journal of Technology and Teacher Education, 12*(2), 211-237.

Caruso, J. B., & Kvavik, R. (2005). ECAR study of students and information technology 2005: Convenience, connection, control, and learning. EDUCAUSE. Retrieved from https://net.educause.edu/ir/library/pdf/ERS0506/ecm0506.pdf.

Christensen, R., & Knezek, G. (2000). Internal consistency reliabilities for 14 computer attitude scales. *Journal of Technology and Teacher Education, 8*(4), 327-336.

Chung, S. (2014). *Pre-service and in-service ESL teachers' beliefs about the use of digital technology in the classroom* (Unpublished master thesis). Carleton University, Ottawa, Ontario.

Cutrim Schmid, E., & Hegelheimer, V. (2014). Collaborative research projects in the technology-enhanced language classroom: Pre-service and in-service teachers exchange knowledge about technology. *ReCALL, 26*(3), 315-332.

Dang, X. T. (2011). Factors influencing teachers' use of ICT in language teaching: A case study of Hanoi University, Vietnam. *International Conference "ICT for Language Learning" 4th edition, Simonelli Editore, 20th-21st October*. Retrieved from http://scholar.googleusercontent.com/scholar?q=cache:H8LC7ZUvOA0J:scholar.google.com/+Factors+Influencing+Teachers'+Use+of+ICT+in+Language+Teaching:+A+Case+Study+of+Hanoi+University,+Vietnam&hl=en&as_sdt=0,5

Davis, L. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly 13*(3), 319-340.

Dogoriti, E. (2010). Perceptions and attitudes towards web-based ELT among English teachers in Greece. *International Conference ICT for Language Learning*. Retrieved from http://scholar.googleusercontent.com/scholar?q=cache:yQeoulce8SUJ:scholar.google.com/+Perceptions+and+Attitudes+towards+Webbased+ELT+among+English+teachers+in+Greece&hl=en&as_sdt=0,5

Dörnyei, Z. (2007). *Research methods in applied linguistics: Quantitative, qualitative, and mixed methodologies*. Oxford: Oxford University Press.

Ertmer, P. A., Paul, A., Molly, L., Eva, R., & Denise, W. (1999). Examining teachers' beliefs about the role of technology in the elementary classroom. *Journal of Research on Computing in Education, 32*(1), 54-72.

Fabry, D. L., & Higgs, J. R. (1997). Barriers to the effective use of technology in education: Current status. *Journal of Educational Computing Research, 17*(4), 385-395.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education*. New York: McGraw-Hill.

Francis, L., Katz, Y. & Jones, S. (2000). The reliability and validity of the Hebrew version of the Computer Attitude Scale. *Computers and Education. 35*(2), 149-159.

Gardner, R. C. (1985). *Social psychology and second language learning: the role of attitudes and motivation.* London: Edward Arnold.

Gunter, G. A., Gunter, R. E., & Wiens, G. A. (1998). Teaching pre-service teachers technology: an innovative approach. Retrieved from ERIC.

Günüç, S., & Kuzu, A. (2014). Factors influencing student engagement and the role of technology in student engagement in higher education: campus-class-technology theory. *Turkish Online Journal of Qualitative Inquiry, 5*(4).

Hismanoglu, M. (2012). The impact of a curricular innovation on prospective EFL teachers' attitudes towards ICT integration into language instruction. *International Journal of Instruction, 5*(1), 183-202.

Hismanoglu, M., & Hismanoglu, S. (2011). Attitudes of English teacher candidates toward ICT. *E-International Journal of Educational Research, 2*(2), 17-29.

Huang, H. M., & Liaw, S. S. (2005). Exploring users' attitudes and intentions toward the web as a survey tool. *Computers in Human Behavior, 21*(5), 729-743.

Isleem, M. (2003). *Relationships of selected factors and the level of computer use for instructional purposes by technology education teachers in Ohio public schools: a statewide survey.* Unpublished doctoral dissertation. Department of Education, The Ohio State University, Ohio.

Isman, A., & Dabaj, F. (2004). Attitudes of students towards Internet. Retrieved from ERIC.

Kersaint, G., Horton, B., Stohl, H., & Garofalo, J. (2003). Technology beliefs and practices of mathematics education faculty. *Journal of Technology and Teacher Education, 11*(4), 549-577.

Kitchakarn, O. (2015). EFL learners' attitudes towards using computers as a learning tool in language learning. *Turkish Online Journal of Educational Technology, 14*(2), 52.

Kopinska, M. (2013). New technologies in foreign language classroom: the role of attitudes. *The 6th edition of the ICT for Language Learning Conference.* Retrieved from http://conference.pixel-online.net/ICT4LL2013/common/download/Paper_pdf/090-ITL29-FP-Kopinska-ICT2013.pdf.

Kuo, M. M. (2008). Learner to teacher: EFL student teachers' perceptions on internet-assisted language learning and teaching. Retrieved from ERIC.

Liton, H. A. (2015). Examining students' perception & efficacy of using technology in teaching English. *Technology, 1*(1), 11-19.

Liu, J. (2009). A survey of EFL learners' attitudes toward information and communication technologies. *English Language Teaching*, *2*(4), 101-106.

McCoy, L. P., Heafner, T. L., Burdick, M. G., & Nagle, L. M. (2001). Gender differences in computer use and attitudes on a ubiquitous computing campus. Retrieved April 12, 2015 from ERIC.

Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *The Teachers College Record*, *108*(6), 1017-1054.

Mitra, A. (2001). Developing a questionnaire to measure the effectiveness of computers in teaching. Retrieved from ERIC.

Mollaei, F., & Riasati, M. J. (2013). Teachers' perceptions of using technology in teaching EFL. *International Journal of Applied Linguistics & English Literature*, *2*(1), 13-22.

Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of Information Technology for Teacher Education*, *9*(3), 319-342.

Myers, J. M., & Halpin, R. (2002). Teachers' attitudes and use of multimedia technology in the classroom: Constructivist-based professional development training for school districts. *Journal of Computing in Teacher Education*, *18*(4), 133–140.

Nolen-Hoeksema, S., Fredrickson, B. L., Loftus, G. R., & Wagenaar, W. A. (2009). *Atkinson & Hilgard's introduction to psychology*. UK: Cengage Learning EMEA.

Özdamlı, F., Hürsen, Ç., & Özçinar, Z. (2009). Teacher candidates' attitudes towards the instructional technologies. *Procedia-Social and Behavioral Sciences*, *1*(1), 455-463.

Raman, K., & Yamat, H. (2014). Barriers teachers face in integrating ICT during English lessons: a case study. *The Malaysian Online Journal of Educational Technology*, *2*(11), 11-19.

Sağlam, A., & Sert, S. (2012). Perceptions of in-service teachers regarding technology integrated English language teaching. *Turkish Online Journal of Qualitative Inquiry*, *3*(3), 1-14.

Savaş, P. (2012). Use of digital video recording in the preparation stage of pre-service foreign language teachers' micro-teachings. *International Journal on New Trends in Education and Their Implications*, *3*(3), 107-116.

Savas, P. (2014). Tablet PCs as instructional tools in English as a Foreign Language education. *TOJET*, *13*(1), 217-222.

Selwyn, N. (1997). Students' attitudes toward computers: Validation of a computer attitude scale for 16–19 education. *Computers & Education*, *28*(1), 35-41.

Tanguma, J., Martin, S. S., & Crawford, C. M. (2002). Higher education and technology integration into the learning environment: results of a survey of teacher preparation faculty. Retrieved April 12, 2015 from ERIC.

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australian Journal of Educational Technology*, *24*(4), 413–424.

Tondeur, J., Valcke, M., & Van Braak, J. (2008). A multidimensional approach to determinants of computer use in primary education: Teacher and school characteristics. *Journal of Computer Assisted Learning*, *24*(6), 494-506.

Tsai, C. C., Lin, S. S., & Tsai, M. J. (2001). Developing an Internet attitude scale for high school students. *Computers & Education*, *37*(1), 41-51.

Tsou, W., Wang, W., & Tzeng, Y. (2006). Applying a multimedia storytelling website in foreign language learning. *Computers & Education*, *47*(1), 17-28.

Uluuysal, B., Demiral, S., Kurt, A. A., & Şahin, Y. L. (2014). A technology integration journey of a teacher. *TOJQI*, *5*(4), 12-22.

van Braak, J., Tondeur, J., & Valcke, M. (2004). Explaining different types of computer use among primary school teachers. *European Journal of Psychology of Education*, *19*(4), 407-422.

Vicario, T., Henninger, E., Austin, M., & Chambliss, C. (2002). College students' responses to new communication technologies. Retrieved April 12, 2015 from ERIC.

Wang, L., Ertmer, P. A., & Newby, T. J. (2004). Increasing preservice teachers' self-efficacy beliefs for technology integration. *Journal of Research on Technology in Education*, *36*(3), 231-250.

Warschauer, M. (1997). Computer mediated collaborative learning: Theory and practice. *The Modern Language Journal*, *81*(4), 470-481.

Warschauer, M. (1998). *Electronic Literacies*: *Language, culture, and power in online education*. Mahwah, NJ: Lawrence Erlbaum Associates.

Woodrow, J. E. (1987). Educators' attitudes and predispositions towards computers. *Journal of Computers in Mathematics and Science Teaching*, *6*(3), 27-37.

Yavuz, S. (2005). Developing a technology attitude scale for pre-service chemistry teachers. *The Turkish Online Journal of Educational Technology*, *4*(1), 17-25.

Yüksel, G., & Kavanoz, S. (2011). In search of pre-service EFL certificate teachers' attitudes towards technology. *Procedia Computer Science*, *3*, 666-671.

APPENDIX A

THE SCALE OF ATTITUDE TOWARDS TECHNOLOGY	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. E-mail is only for communication; it cannot be used in education.					
2. OHP, slides and projection should not be preferred as they take too much time to be used.					
3. Using the Internet in the learning process is a waste of time.					
4. Using technological tools does not affect students' motivation.					
5. Technological tools do not need to be used in instruction.					
6. Recording some parts of the lesson on videotapes could provide the students the opportunity to see their mistakes.					
7. Because the videotapes could be watched again, students could get feedback.					
8. Technological tools could be used for practice or revision.					
9. Students should receive basic education on computer literacy.					
10. Using current technologies would promote the improvement of new ones.					
11. Technological facilities have a positive effect on productive studying and learning.					
12. Using technology would facilitate the understanding of difficult subjects.					
13. One does not have to use technological facilities in order to be successful in life.					
14. Daily and yearly plans should be prepared by teachers using computers.					
15. Lessons should often include computer-assisted instruction.					
16. Students should get advance information on the usage of new technologies.					
17. The usage of new technologies in teacher training should be increased.					
18. Technological tools could only succeed when they address all the sense organs.					
19. In order to be able to graduate from the university, the ability to "use the technological materials of the field" should be rated.					

Cross-cultural Comparison of Teachers' Views upon Integration and Use of Technology in Classroom

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ABSTRACT
The purpose of the study is to compare teachers' views upon integration and use of technology in classroom. To make cross-cultural comparison of teachers' views, we interviewed with nine teachers in a primary school in city of Erzincan, Turkey and compared the views of the teachers with those of the teachers living in foreign countries. To obtain the data from other countries, we used the comments of the teachers who shared their views with us at Edutopia Blog Page. We used a qualitative research method with semi structured interview form to gather data and to compare them with the comments in blog page. Having analysed, compared and discussed the views of the teachers, we recommended that the school principals, teachers and students should be encouraged to integrate technology and use mobile technology in classroom so that the students can prepare themselves for competition and race with the others and future careers.

Keywords: Integration of Technology, Classroom Management, Mobile Devices, Teaching, Learning

INTRODUCTION
Almost every part of our lives is convoluted by technology. It directly affects the way we shop, connect, socialize, play and most importantly learn. As constantly presence in our lives, it is inevitable to have mobile technology in the classroom and course environment. To prepare the students for the future, school principals, teachers and parents can work in cooperation to enhance the integration of technology into classrooms.

With the rapid development of instructional technology in every aspect and level of education, the teachers, trainers, masters, tutors, instructors, education coaches, school principals and school supervisors have tried to integrate technology in schools and find the best for the students to improve learning skills. Besides, almost all students have technological devices such as smart phones, iPads, tablet computers, laptops, personal computers that can be used in learning process. Many educational organizations, institutions and schools in European countries apply "Bring your own device", which refers to a technology model that allows and enables students to bring their own mobile devices to school for learning in the classrooms, allowing technological integration and use of technology in classrooms to be effective. This term "bring your own device" was first launched in the world in 2013, with companies allowing employees to use their personal laptop computers, smartphones, tablet computers and other mobile devices in the workplace. But at the same time it was seen in the education sector with a great number of schools around the world.

The most important factor of effective integration of technology is the teachers' skill and ability to shape educational technology activities to fulfil students' needs. Teachers know their content and pedagogy, but regarding technology, teachers often learn with students. Teachers focus on teaching students significant technology skills, which include how they work the technology, but many teachers ignore the indirect skills of knowledge integration and a deeper understanding of analysing information (Fulton, 1997).

Teachers play an important role in the effectiveness of technology use and students' learning process. The purpose of this study is to explore primary school teachers' views and interest in the requirement of technology and their use of technology in the classroom

LITERATURE REVIEW
Integrating technology in the classroom is not about teaching students to operate computers, but about helping teachers to use technology as a tool for learning (Sheingold, 1990). Fulton (1997) used the term of technology fluency to describe the changing definition of what students need to know about technology. He indicated that teachers model technology fluency by using technology in the classroom, applying technology across the curriculum, and integrating technology to facilitate collaboration and cooperation among students.

Recent technological advancement in education and computer usage is rapidly transforming work culture and teachers cannot escape the fact that today's classrooms must provide technology-supported learning (Angers & Machtmes, 2005). Preparing for technology and knowing how that technology can support student learning must become integral skills in every teacher's professional repertoire. District and school policy and professional development workshops and training are designed to positively influence teachers' adoption and usage of computer technology. However, the usage of computer technology in the classroom has been slow over the years (Krysa, 1998).

Teachers' acceptance of technology is absolutely essential if technology provided to schools is to be used effectively (Carlson and Gadio, 2003). Inasmuch as educational technology is not transformative by itself, it requires teachers to improve student learning. It is the teachers who can integrate technology into curriculum and use it. Though there are students who could learn independently how to use technology to improve their learning skills, it is not probable for them to improve as long as teachers remain key person for students' access to educational opportunities afforded by technology (Stryker, 2000). Hence, it is important for teachers to be computer literate, and be prepared to use information technology in schools.

According to Kumar et all (2008) the administrators, namely the school principals, should encourage teachers to continue developing technology based skills. The administrators need to be more open minded about towards the suggestions by the teachers and act accordingly. If a teacher feels handicapped and wishes to attend a course in information technology, then the teacher's wish must be granted and should be recommended for the next course. This will make the teachers move towards the usage of the computer and find it useful in no time.

DeWitt (2013) argued that planning for professional learning for teachers is also seen as essential by many authors. "Not all staff understand how it works. Many teachers want to allow students to bring their own devices but they do not always understand how they handle the concept. According to Howard (2013), many teachers in primary schools have not had experience and secondary school teachers have experience of students using laptops, not other devices nor a mixture of devices.

In their study, Dixon and Tierney (2012) argue that the program of BYOD has implications for pedagogy as the teacher will need to cater for the least powerful device in the classroom and students won't all have the same programs and applications installed in their devices. However, many BYOD programs specify the capability of devices that can be brought by students to overcome this problem.

In her study on effective technology integration, Su (2009) argues that, in traditional learning environment, teachers have learnt the content long before, when they were students at high school, and the teaching resources and textbooks don't change much over the years, on the other hand, in constructivist learning environment, teachers are learning all the time. Technology enables teachers to redesign and modify the provided teaching resources for better teaching and learning outcomes in various situations.

Blair (2012) stated in his study that today's students need educators to re-envision the role of technology in the classroom. Students develop the four C's, critical thinking, creativity, communication, and collaboration, thus effective application of these significant skills in a technology-based life requires acquiring them in a technology-based learning environment. This environment includes two elements: Technology must be put into the hands of students and we must rely on them through more contemporary technology use. For student performance to approximate student potential, students need access to a constantly evolving series of technological tools and activities that involve innovation, teamwork, decision-making and problem-solving.

Cheung and Slavin (2011) obtained the findings that support those of earlier reviews by other researchers. They state in their study of meta-analysis that the classroom use of education technology will undoubtedly continue to expand and play an increasingly significant role in public education in coming years as technology becomes more sophisticated and more cost-effective. They suggest schools and districts should make efforts to identify and adopt research-proven education technology programs to improve student academic achievement. They have the conclusion that the technology approaches most widely used in schools, especially supplemental computer-assisted instruction, have the least evidence of effectiveness.

Kemp et all (2014) state in their study that technologies such as the Internet and personal computer do not increase access or improve learning for all potential students. The most fundamental drawback is the unequal availability of technologies for people of low socioeconomic status. According to them, technologies such as the Internet and the personal computer could increase the benefits of education and reduce its negative aspects, depending upon the ability of teachers to make use of them in the classroom and the skill of managing online

classes. In the educational setting, the problems, such as the lack of availability of technology for low-income students, are beyond solution. They suggest that technology should not be an essential tool for receiving a quality education, but it should be viewed as an option to enhance learning and increase opportunities.

Problem Statement and Purpose

The aim of the research on Technology Integration and Use in Classrooms is to determine the similar and different views of primary school teachers from various countries around the world in a cross cultural context, and to evaluate the intercultural conditions of primary school students in terms of technical equipment.

Methods and Research design

We used a qualitative research method to understand and evaluate teachers' views and intention. This kind of methodological approach was chosen as it enables researchers to interpret and make judgement about immeasurable data (O'Tool and Beckett, 2010, p.28). we conducted this research in a particular setting through Edutopia Blog and a group of Primary School teachers in Erzincan City. For this reason we relied on case study design for the purpose of our enquiry.

Participants

Participants were nine classroom teachers working in a Primary School in Erzincan City, Turkey and fifteen Primary School teachers having written comments on Edutopia Blog. We preferred and used easy accessible sample technique in the research, as it increases the speed of collecting data and enables researchers to access the sample easily (Yıldırım and Şimşek, 2006). We obtained the data from 9 classroom teachers who admitted to be involved in the interview for the research, and 15 primary school teachers from various countries replying and writing their comments on Blog page. The participants were asked whether they were contented to answer to the questions, and then we applied the tool. The names of the teachers are coded with letters and numbers.

Research Instrument

In the study, we used the tool with semi structured interview form to gather data from classroom teachers and to compare the data with blog comments. We asked ten open ended questions to the participants. The questions were designed in accordance with the comments of the participants for Edutopia Blog about 'Teaching and Learning: Using iPads in the Classroom' launched by blogger Ben Johnson who is an educator, administrator and author.

Data analysis

We obtained the data with the help of the interview with the participants; the data were then transferred and digitalized into computer in order to form digital data. We used content analysis with the percentage and frequency values.

FINDINGS

The findings that we obtained from the classroom teachers for the questions in the semi-structured interview form and the comments made by the participants teachers at the Edutopia blog are given below.

The first question was "How many students are there in your classroom and how many of them have tablets, notebooks, laptop, computer and iPad? The second question was "As a teacher do you use any of these devices in the classroom?" The sample statements opposite one another for the first question are given as followings.
"There are 17 students in my class, 16 of whom have tablet computers…."(X1)
"There are 21 students in my class, 3 of whom have tablet computers, and 2 have notebooks…" (X2)
"There are 17 students in my class and only 6 of them have tablet computer."(X4)

There are 17 students in one classroom and 16 of them have technological devices to use in the classroom, which suggests that the classroom is technologically well equipped and the students can equally benefit from technology in maximum level. On the other hand, while there are 21 students in another classroom, yet only 5 of them have technological devices to use in the classroom, indicating that the classroom is technologically poor equipped, and the students cannot follow the courses, instructions and assignments equally. These two teachers gave answers just opposite one another to the question of "Do you want to set up a website to communicate better with your students and to enable them to be successful in their classes? The former teacher (x1) replied *"I would like to set up a website to communicate with them better and to help them to be successful at school"*. The latter (x2) replied *"I have not thought of creating a website to do the communication with my students"*. These two opposite statements show that the integration and use of technology in classroom largely depends on the intention of the teachers. Through communication technology in education, teachers can effectively gain students' attention by providing communication technologies that are a familiar part of students' lives.

According to Jackson (2001), teachers are individuals with different personalities and characteristics and so will make different professional judgements; no one can say that there is one right way to teach, and he maintains that good teachers continue to be learners themselves and will continue to develop their skills, knowledge and teaching style, so that teaching becomes a continual process of personal and professional development, and he argues that this can be rewarding and exciting, and has benefits in the classroom.

In our study, the ratio of technological devices to the number of the students in the classrooms are 20/24 (x3); 20/32 (x5); 15/28 (x6); 16/20 (x7); 14/17 (x8); and 18/24 (x9), as shown in Table 1. All the participant teachers in the study declared that they used technological devices in the classroom such as personal computer, laptop, notebook, tablet and iPhone. As the figures in the other classrooms suggest that at least 60 percent of the students have technological devices such as tablet, iPhone, laptop, notebook and smartphones to use in the classroom under the supervision of their teachers. Regardful of student collaboration in the classroom, this ratio might be enough for the students to follow the tasks in their courses with competent teachers

Table 1: The digitalized data of interviews

Participant Teachers	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Number of Students	17	21	24	17	32	28	20	17	24
Number of Devices*	16	5	20	6	20	15	16	14	18
% of Devices to Students	%94	%21	%83	%35	%63	%53	%80	%82	%75

** iPhone, tablet, laptop, notebook, smartphones*

As we designed our study in cross-cultural frame, we used the comment statements of the other teachers from various parts of the world. The statements are as follows: (C.F. Edutopia), who is Technology teacher at primary school, says *"Our school just equipped many of our classrooms with small sets (4-8) of iPads…."; (B.G.* Edutopia*), who is a Special Ed STEM teacher, says "I use the NASA app for our after school NASA Explorers School Program…"; (*C. J. Edutopia), who is Math-Science teacher, says *"I just started at a school where each student has access to their own iPad… I have begun using it a bit for my math and science classes… I'd like to know of good apps for Biology, Earth Science, Algebra and Geometry…"*; (A. K. Edutopia), Special Ed and Science teacher, says *"I am lucky to teach in a county that has been extremely forward thinking on technology. Our classrooms have all had Activeboards, Desktops, laptop carts, scanners, etc. since the 90's….Our schools are fully WIFI and students are encouraged to bring any and all technology…."; (*S. L. D. Edutopia), Science teacher, says *"Our technology group is saying that we can't bring any iPads onto campus…."; (P.* Edutopia*), who is Instructional Technology Specialist, says "I have 30 iPads in an ELA classroom…"* As the comment statements show that not every school, classroom, teacher and student group in different countries has full facility and full access to technological devices. Almost all commenters in the blog are in favour of having individual technological facilities, whereas (S. L. D. Edutopia)'s technology group are in favour of traditional computer laboratory, technology teacher-based education in the classroom. As the majority of the technology is kept in the computer laboratories or central computer classrooms, the only time the students can use and develop their skills remains when it is their turn to visit the computer lab. The design and layout of the computer lab makes it difficult to accomplish the ultimate goal of classroom instruction. On the other hand, the approach and the intention of the teachers and technology groups in a school are of great importance in the achievement of fast access to contemporary educational facilities all over the world. Integrating technology into the classroom is definitely a great way to reach diversity in learning styles, thus giving students the chance to interact with their classmates more by encouraging collaboration.

The third question was "In what courses do the students use these devices?" The sample statements to this question are as follows;
"… My students are using these technological tools for almost all courses…"(x1), (x5), (x7)
"… Technological devices are used for Turkish Course and Maths Course in my classroom…."(x3)
"… I allow the students to use their iPads and tablets for English Course and Math Course…"(x9)

The other statements show that the technological devices are used particularly for Mathematics Courses and Language Courses by the students in the classrooms. As shown in Table 2, in our plot school, some teachers allow their students to benefit from technological devices for Turkish Courses and Mathematics Course in their classroom, while the others encourage students to use them for all courses.

Table 2: The Digitalized Data of the Courses the Devices are used in

Participant Teachers	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Courses the devices are used in	All Courses	Maths	Turkish Maths	Turkish Maths Science	All Courses	Turkish Maths Social Science	All Courses	Turkish Maths Science Tech Social	English Maths

:

From the comment statements of other teachers from different countries all over the world, these are of great importance for cross-cultural comparison.

"*… I have begun using it abit for my Math and Science classes….. I would like to know of good apps for Biology, Earth Science, Algebra and Geometry…"(C. J.* Edutopia*)*

"… Check out these great free apps. I have used all of these in a classroom and they are great! Pass the Past (History), Number Line (Math), Opposite Ocean (English)…" (A.H. Edutopia*)*

"…. I recently started using this Base Ten app to help teach them the concept of numbers, including addition and subtraction practice…" (B.J. Edutopia*)*

As in all statements, technological devices have great benefit to some courses such as Maths, Social Sciences, Language and Science. The teachers have noticed the effect of technology on learning. According to Daniel (2010), education in the 21st century requires more emphasis on learning than on teaching. He states in his study that the ideal is the adoption of a culture of self-directed learning by individuals and communities. Technology can encourage this transition. To achieve upper-level learning, every student should be made to benefit from technology- supported education at equally-designed level.

The fourth and fifth questions were "What programs do the students use in these devices? and "How often do the students download sound recording, video, lecture notes, books, etc?" The sample statements to these questions are as follows;

"…They usually use Map-App, picture App for drawing and Microsoft Word software for writing and drawing. They seldom download, voice recording, video, books and lecture texts…"(x1)

"….They are using a program named Okulistic. They sometimes download voice recording, video, books and lecture notes…" (x2)

"….My students use school programs with course narration. The students generally download Voice recording, video, books and lecture notes… they share them with each other…"(x5)

"…They usually use such programs as Adobe Flash Player, Java, Office, Winamp, Media Player, VLC player. My students very often download Voice recording, video, books and lecture notes…" (x7)

From these statements, technological devices can be said to have launched the transformation of teaching and learning, however the basics of teaching and learning to have remained unchanged. Students can download and attach videos, voice recordings to their assignment tasks and share them with each other, which creates a collaborative learning environment in the classroom. Table 3 shows the Apps used in the courses by the students in the classroom.

Table 3: The digitalized data of Social website the teachers use for communication

Participant Teachers	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Applications used in courses	Office MsDos Powerpoint	Okulistik Power point	AFP Power point	Markakompus Okulistik Office MsDos AFP Powerpoint	School Program Power point	AFP Power point	AFP Java Office Winamp Media Player VLC	Marca Campus Okulistik Daynet AFP Java Office	Education Websites Power Point

Some interesting sample remarks from the comments of the participant teachers from other countries;

"…Students can also attach videos, and voice recordings to their field notes …. students can create a collaboration web to share findings and discuss conclusions about different perspectives of the same project.. "(Blogger B.J Edutopia*.)*

"…My students are so excited about finding new educational apps that it has almost become a competition within my classroom to see who can find and learn the coolest educational app each week …"(A.K. Edutopia*)*

"…students listen to the audio lessons directly on their iPads. Large screen allows them to view PDF transcripts as well, which is much more convenient than on iPhone…." (S.M. Edutopia*)*

From the comments, it appears that technological devices can do the same contribution to learning and teaching activities in every part of the world. Students can download videos, sounds, texts, books, applications, pictures, drawings, listen to the audio lessons directly on their tablets or iPads, see the world on the screen, do the practice in Language Courses and save and keep all kind of texts and pictures in their computers, share them with their classmates, thus creating a collaborative environment that is very effective strategy of learning. Cooperative and collaborative learnings have the same features, Allen and Plax (1999) as well as Bruffee (1999) argue that cooperative and collaborative learnings involve individual effort however they bring students together in small groups to work on specific, well-defined and well-structured problems and questions. There are clear and correct answers or solutions for problems and questions (Jonassen, 1997). The students can access to these answers and solution with the help of collaboration by sharing information with each other through technological devices.

To determine the teachers' views on communication with their students, we asked "What social networking sites like Facebook, Twitter and Messenger do you use to communicate with your students outside the school?", and "Do you want to set up a website to communicate better with your students and to enable them to be successful in their classes?" The reply statements to these questions are as follows;
"… I do not use any social networking site to communicate with my students outside of school. I would like to set up a website to communicate with them better and to help them to be successful at school… (x1)
"… I do not use any social networking site to communicate with my students outside of school. I have not thought of creating a website to do the communication with my students…" (x2)
" … I am using WhatsApp as social networking site to communicate with my students outside of school. I did not think to establish the website to communication with my students out of school…" (x3)
"…I am using WhatsApp as social networking site to communicate with my students outside of school. I did not think to establish the website to communication with my students out of school…"(x6)
"…I do not use any social networking site to communicate with my students outside of school, I make telephone communications. To communicate with my students…"(x8)

Of all the participants in our study, only two have used social networking sites like WhatsApp and Facebook, and only one has used mobile phone to communicate with their students out of school (Table 4). Out-of-class communication makes student-teacher relationships more personal and contributes to student learning. It is also the wellspring for continued academic exchange and mentoring (Lucas, 2015). From the remarks of the participants, technology has not been used as an effective means of communication with the students by the teachers. The school in which the participants work may be said not to have completed technological integration so that the teachers, parents, management staff and the students can have effective communication with each other. The intention and the willingness of the teaching and management staff of the school to communicate with their students and the students' parents are very important for the communication to be provided through technology integration.

Table 4: The digitalized data of Social website the teachers use for communication

Participant Teachers	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Social website the teachers use for communication	No	No	WhatsApp	No	No	Facebook	No	Mobile phone	No
Willingness to set up website	Yes	No	No	Yes	Yes	No	Yes	No	Yes

The comments of the blog participants from different countries are as follows;
" … I have long corresponded to my students and their parents by means of Messengers, it is free and very easy for my students to use… I am attending to a course to establish and run my own class website…"(A.P. Edutopia*)*
"… I use the Ipad along with social networking to involve students in blogging which also enhances their literacy skills… I will ask a friend of mine who is a computer programmer to for help to set up a website for my class."(B.S. Edutopia*)*

It proves hard for teachers to take time out of busy schedules to learn how to create a class Web page, and keep it up to date with a calendar of events, assignment tasks at home, class projects, useful links and other necessary information. E-mail and SMS are useful for many interactions. However, teachers need more effective ways to provide students with the right information at the right time. The latest collaboration tools are a lot more natural

and practical to use than traditional Internet technologies. These tools provide teachers with an effective way to bridge the technology gap and embrace the kinds of tools their students already use. Almost all students can access to this information at any time, even when they are studying for an exam at night or on a Sunday afternoon. Blogs and wikis help teachers collaborate on lesson plans and help students develop their group projects.

To find out the participants' views and intention on their willingness for technology equipped classroom, their belief in benefits of technology and their belief in success in learning, we asked these questions; "Do you want to teach in an environment equipped with technological tools?", "Do you believe technological tools will contribute positively to the education of students?", "Do you think for the students to have these devices can contribute to their academic achievement?" The replies to these questions by the participants as follows;
"… I'd like to do my courses in technology-equipped classroom. If used in accordance with the purpose, it will provide a positive contribution to the education of students, and I believe that technological tools improve academic achievement…"(x3)
"… I'd like to do my courses in technology-equipped classroom. This will contribute positively to students' education, and I believe it will improve their academic achievement…."(x6)
"… I'd like to do all my courses in technology-equipped classroom. It will make a positive contribution to the education of students, and I believe that technological tools manage to improve academic achievement…."(x8)

In the study, all of the participants from various countries remarked that the classrooms that are equipped with technological devices such as computers, tablets, Video/Data projectors and projection screens, LCD/TV monitor, DVD players, Sound Systems, Wireless network coverage could provide effective learning facilities for the students (Table 4). To achieve full benefit from technology-equipped classrooms, the teachers are required to learn how to use the technological devices. Regarding this necessity, one teacher says in her comment *"… As a teacher who has rarely used technology in the classroom I am very nervous about the use of this new technology. However, before I begin to fully implement technology I obviously have to work on incorporating small pieces of technology into my daily lessons. I need to be prepared in case something does not go as planned…"(J.D.* Edutopia*).* Beyond ensuring that the students are actively learning or creating to meet certain goals or objectives, the key with technology is making sure that its use is organized, and that the teachers are ready to use it.

Table 4: The digitalized data of interviews' willingness and beliefs in technology

Participant Teachers	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**
Willingness for technology equipped classroom	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Belief in benefits of technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Belief in success in learning	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

According to a research by Gorder (2008), the teacher is considered an important factor for success when using and integrating technology in the classrooms, and the findings from this study indicates that teachers manage to use technology for professional productivity and to facilitate and deliver instruction better than they can use technology for integration into teaching and learning.

In our study, all the participant teachers from both pilot school and Edutopia stated that they want to teach in classrooms with technological equipment, which highlights the possibility that integration of technology in classroom will lead to success.

DISCUSSION AND CONCLUSION

Technology integration in education and hence the classrooms equipped with technological devices such as computers, Video/Data projectors and projection screens, LCD/TV monitor, DVD players, Smart Boards, Sound Systems, Wireless network coverage can all enrich teaching and learning process in many ways. The success and the value of technology integration in teaching and learning settings largely depends on the willingness, intention and the technological skills of the teachers, and how well and efficiently it is used by the students and the teachers.
According to the participants in Turkey and in the other countries, not all students and the classrooms have the same number of technological devices compared to each other in the same school. In one classroom, of the

seventeen students, only six have their own mobile device, while in another classroom, sixteen students have their own mobile device. According to a classroom teacher in a different country, there are only four iPads in her classroom, and these devices are belonging to the school not to the students. This imbalance distribution of mobile devices to the number of the students can create difficulties in terms of effectiveness of the course, as only the students with mobile devices can access to the knowledge very easily, otherwise the teacher would have to change the way he/she teaches in the classroom.

Integrating technology into the classroom and its use effectively are both a great way and opportunity for teachers and students to reach diversity in teaching and learning styles. Technology, as long as used correctly and properly, will help prepare students for their careers in the future. Likewise, it helps the teachers prepare students for the environment of the real world. The students must learn to be tech-informed or tech-savvy so as to be successful citizens in their future lives as all the nations in the world become more and more technology dependent.

According to our findings from the remarks of the participants, the students do a lot of tasks with their mobile devices like downloading books, saving information, copying and saving texts, drawing pictures, charts and maps, listening lessons, recording sounds, easy access to all kinds of dictionaries, and share them with their classmates, thus creating both an individual and a collaborative learning environment and enhancing learning process.

Educational resources are very important for students to develop themselves. Particularly books, textbooks and workbooks are not available at every school library at every part of the country and every part of the world. As students can have easy access to digital textbooks through mobile devices, the implementing and using technology in the classroom prove inevitable.

The students now live in a digital communication age. Almost all the teachers, parents and students communicate with each other through mobile tools. In our study, some of the teachers are not so willing to communicate with their students through social networking sites like Facebook, WhatsApp, Messengers ect. In fact, these facilities enhance the effectiveness of communication between teachers and students. As the digital communication tools develop teacher-student interactions, this sort of communication is preferred by the teachers, parents and students.

As a conclusion, the school principals, teachers, parents and students should force the school management to implement and integrate technology into classrooms so that the students can prepare themselves for their future careers, keep pace with the other students who have technology in their schools, have the chance to interact with their classmates, access to up-to-date information, become more active and engaged in the course, and utilize multiple types of resources online. The teachers should learn how to use technology effectively to be useful to the students, provide students a collaborative environment and teach them collaboration, with the technology in the classroom; teacher should be encourager, coach and advisor. The teachers should encourage students to have mobile technology in classroom and at home, as it can bridge the gap between classroom and home learning.

REFERENCES

Allen, T. H., & Plax, T. G. (1999). *Group communication in the formal educational context*. In L. Frey, D.S. Gouran, & M. S. Poole (Eds.), The Handbook of Group Communication Theory & Research (pp. 493-519). Thousand Oaks, CA: Sage Publications.

Angers, J., & Machtmes, K. (2005). *An ethnographic-case study of beliefs, context factors, and practices of teachers integrating technology*. The Qualitative Report, 10 (4), 771-794.

Blair, N., (2012). *Technology Integration for The New 21st Century Lear*ner. National Association of Elementary School Principals, February 2012.

Bruffee, K. A. (1999). *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge* (2nd ed.). Baltimore, MD: The John Hopkins University Press.

Carlson, S., & Gadio, C.T. (2003). Teacher professional development in the use of technology.

[Online]. *Technologies for Education*. Available: www. TechKnowLogia.org.

Cheung A. C. K., Slavin R. E. (2011). The Effectiveness of Education Technology for Enhancing Reading Achievement: A Meta-Analysis. The Best Evidence Encyclopedia, U.S. Department of Education.

Daniel, J. S., (2010). *Mega-Schools, Technology and Teachers, Achieving Education for All*. Taylor & Francis e-Library, 2010, London.

DeWitt, P. (2013). *Are schools prepared to let students BYOD?* Education Week 2013, April 10

Dixon, B., & Tierney, S. (2012). Bring your own device to school. Microsoft. BYOD in Schools Literature Review 2013 NSW Education and Communities

Fulton, K. (1997). *Learning in a digital age: Insights into the issues: The skills students need for technological fluency* [Online document]. Available http://www.mff.org/pubs/ME164.pdf

Gorder, L. M. (2008). *A Study of Teacher Perceptions of Instructional Technology Integration in the Classroom*, Delta Pi Epsilon Journal, Spr/Summ 2008, Las vegas, Nevada.

Howard, S., (2013). *Evaluation of DER NSW Phase 2 Case Study Findings*. Sydney: NSW Department of Education and Communities (http://www.dec.nsw.gov.au/about-us/how-weoperate/national-partnerships/digital-education-revolution/rrql/research).

Jackson, G. O. (2001). Learning to Teach Design and Technology in the Secondary School, Design and Technology Association (DATA). P. int., New York

Jonassen, D. (1997). Instructional design models for well-structured and illstructured problem-solving learning outcomes. *Educational Technology: Research and Development 45*(1), 65-95.

Kim C.M., Kim M. K., Lee C., Spector J. M., DeMeester K. (2013). Teacher Beliefs and Technology Integration. Teaching and Teacher Education 29 (2013) 76-85 Elsevier.

Kemp, A. T., Preston, J., Page, C. S., Harper, R., Dillard, B., Flynn, J., & Yamaguchi, M. (2014). Technology and teaching: A conversation among faculty regarding the pros and cons of technology. *The Qualitative Report*, 19(6), 1-23. Retrieved from http://www.nova.edu/ssss/QR/QR19/kemp6.pdf

Krysa, R. (1998). [Online]. *Factors affecting the adoption and use of computer technology in schools.* Available: http://www.usask.ca/education/krysa

Kumar N., Rose R. C., D'Silva J. L. (2008) *Teachers' Readiness to Use Technology in the Classroom: An Empirical Study*. European Journal of Scientific Research Vol.21 No.4 (2008), pp.603-616

Lucas, B. F. (2012). Enhancing Out-of-Class Communication: Students' Top 10 Suggestions. http://www.facultyfocus.com/articles/philosophy-of-teaching/

O'Tool, J., Beckett, D. (2010). *Educational Research: Creative Thinking and Doing*. Victoria: Oxford University Press.

Sheingold, K. (1990). *Restructuring for learning with technology. The potential for synergy*. In K. Sheingold & M. Tacher (Eds.), Restructuring for learning with technology (pp. 9-27). Center for Technology in Education, New York.

Stryker, C. (2000). *Teaching successful telecourses.* Bozeman, MT, National Teachers Enhancement Network: Montana State University.

Su, B. (2009). Effective technology integration: Old topic, new thoughts. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2009, Vol. 5, Issue 2, pp. 161-171

Yıldırım, A., Şimşek, H. (2006). *Qualitative Research Methods in Social Sciences.* Ankara: Seçkin Press.

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Development of Digital Instruction for Environment for Global Warming Alleviation

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ABSTRACT
Technological education and instruction are widely used in the present education trend. Using of digital instruction for environmental subject can encourage students in learning and raise their awareness and attitude on environmental issues. The purposes of this research were: 1) to construct and develop the digital instruction for environment for global warming alleviation, 2) to compare the difference of the student' achievement scores earned before and after using the digital instruction, and 3) to study the students' satisfaction towards the digital instruction for environment for global warming alleviation. The research samples consisted of 40 students in grade 6 collected by purposive sampling technique. The instruments used in this research were the digital instruction for environment for global warming alleviation and satisfied evaluated questionnaire. The frequency, percentage, mean, standard deviation, and t-test were used to analyze the data. The findings indicated that: 1) the digital instruction for environment for global warming alleviation comprised of five environmental topics, 2) the students' achievement scores after using the digital instruction increased with statistical significance ($p<0.01$), and 3) students' satisfaction in knowledge receiving was at good level and the overall satisfaction of students in digital instruction was at high level.

INTRODUCTION
Presently, technology has played an important role and influenced in education sector. Use of technology and technological tools has become common in the learning process. Al-rahmi, et al. (2015: 625) stated that in the last decade, academic institution has required to develop and implement the e-learning, because e-learning is fast and easy way of teaching and learning through network technologies (Naresh and Bhanu Sree Reddy, 2015: 484). The development of technological tools and instructions aims at students' learning achievement. The efficient and effective use of technology and interaction affect learning outcome and learning achievement. Increasingly, instructors use educational technology as instruction tools in learning in order to stimulate interaction among students and between instructor and students. The students have good attitude toward learning and feel happy in learning (Sher, 2009: 116; Ariratana, 2010: 26; Jittisak and Jinwan, 2015: 121).

Technology is currently being used to help students and teachers in learning and teaching. Nowadays education sector in Thailand applies technology and technological media to contribute and facilitate leaning and education process, to stimulate students' attention, and to enhance their knowledge (Praneetham, 2015: 334). Teaching and instructional process has been improved to encourage students to know how to think analytically. They can search the information from various sources of knowledge by themselves and learn from real life experience and a more real practice (Ariratana, 2010: 26). Education technology leads to improve students' achievement. Education process always device a way of generating and collecting evidence of achievement (Ilechukwu, 2014: 35).
Environmental issues in the world are becoming severe. Global warming, caused by human activities and human's way of living adding carbon dioxide, has a direct impact on climate change and affects on environmental and social changes. Rising temperature and rainfall variability are leading the climate change, which affects the fundamental Earth systems and environmental degradation (Jahi et al, 2009: 258; Thiengkamol, 2011: 22; Adam et al., 2015: 52; Praneetham, 2015: 333, Praneetham and Leekancha, 2015: 453). Raising environmental awareness of people can ensure effective environmental improvement and protection. Hence, environmental education of the younger generation is very important (Xu, et al., 2013; Vinokurova et al, 2015: 315; Praneetham and Thathong, 2012: 6). Many researchers mentioned that education is an affective process and very important driver for sustainable environmental conservation. It can help increase knowledge and raise people's awareness regarding environmental problems. (Stapp and Dorothy, 1981: 1; Chunkao, K. 1993: 715; Thiengkamol, 2011: 25; Praneetham and Thathong, 2012: 10; Praneetham and Leekancha, 2015:

458). Therefore, teachers are more aware of the importance of teaching and learning by using appropriate technological education, tools and instruction for environmental subject (Praneetham, 2015: 338). Rational knowledge of human can reflect their thinking between their behavior and the natural environment (Xu, et al., 2013: 1285). Effective education process and approach can help people increase their knowledge and understand about environmental problems, as well as raise their awareness and foster their attitude on environmental conservation. Using of digital media instruction, multimedia, graphics, and video with sound can attract the students' attention. The learners have fun and enjoy learning. At the same time, they can develop their potential continuously. The digital instruction makes it easier to understand the content. Moreover, the learners can learn by themselves at their convenience and needs (Pasawano, 2013: 160). Therefore, the researcher is interested in construct the digital instruction for environment for global warming alleviation which will help students gain sufficient knowledge about global warming, energy and energy conservation. This instruction can be an effective tool for raising awareness of learners regarding environmental problems.

THE PURPOSES OF THE RESEARCH

The objectives of this research were:

1. To construct and develop the digital instruction for environment for global warming alleviation.
2. To compare the difference of the student' achievement scores earned before and after using the digital instruction for environment for global warming alleviation.
3. To study the students' opinion towards the digital instruction for environment for global warming alleviation.

RESEARCH METHODOLOGY

The research design was implemented in steps by step as follows:

1. Population was students in grade 6 of Wat Pho Nimitr school, Surat Thani province. The research samples consisted of 40 students in grade 6 collected by purposive sampling technique. The research was conducted within the first semester of the academic year 2015.
2. The instruments used for gathering data were:

2.1 The digital instruction for environment for global warming alleviation. The digital instruction consisted of 5 topics which were: 1) energy and electricity equipment used in everyday life, 2) changes in weather and global warming, 3) use of vehicles and use of renewable energy, 4) energy conservation for global warming alleviation, and 5) activities in daily life and saving energy.

2.2 Pre-test and post-test of each topic and a questionnaires with a five-level rating scales on opinion towards the digital instruction for environment for global warming alleviation.

The content and structural validity were determined by Item Objective Congruent (IOC) with 3 experts in the aspects of technology education, sciences, psychology, social research methodology and environmental education.

3. The frequency, percentage, mean ($\bar{x}$), standard deviation (SD), and t-test were used to analyze the data.

RESULTS AND DISCUSION

The sampled respondents of this study were 40 students in grad 6 of Wat Pho Nimitr school in Surat Thani province, Thailand. The samples consisted of 20 female students and 20 male students. The ages were 11 years old with 22.5 % and 12 years old with 77.5 %.

The results of the study are shown in Tables 1- 4 below.

Table 1: Student' achievement scores from pre-test and post-test using the digital instruction for environment for global warming alleviation

Topics	Scores	Pre-test		Post-test	
		($\bar{x}$)	Percentage	($\bar{x}$)	Percentage
Topic 1	5	3.58	71.50	4.80	96.00
Topic 2	5	2.95	59.00	4.45	89.00
Topic 3	5	3.50	70.00	4.68	93.50
Topic 4	5	3.40	68.00	4.63	92.50
Topic 5	5	4.58	91.50	5.00	100.00
Total	25	18.01	72.00	23.56	94.20

Topics: 1) energy and electricity equipment used in everyday life, 2) changes in weather and global warming, 3) use of vehicles and use of renewable energy, 4) energy conservation for global warming alleviation, and 5) activities in daily life and saving energy.

Table 1 shows mean score of students' achievement in pre-test and post-test of each topic. Each topic has 5 questions for pre-test and 5 questions for post-test. The five topics of digital instruction comprised of topic 1) energy and electricity equipment used in everyday life, topic 2) changes in weather and global warming, topic 3) use of vehicles and use of renewable energy, topic 4) energy conservation for global warming alleviation, and topic 5) activities in daily life and saving energy.

The results indicate that the overall mean score of students' achievement in pre-test was 18.01 out of 25 with the percentage of 72.00. The overall mean score of students' achievement in post-test was 23.56 out of 25 with the percentage of 94.20.

Table 2: Comparison between pre-test and post-test of students using the digital instruction for environment for global warming alleviation

	No. of Students	Full scores	$(\bar{x})$	SD	t-value	p-value
Pre-test	40	25	18.01	2.16	-23.93	.000**
Post-test	40	25	23.56	1.28		

The finding reveals that there was a statistically significant difference (at the level of 0.01) between the achievements of students in pre-test (mean = 18.01, SD = 2.16) and post-test (mean = 23.56, SD = 1.28) by using the digital instruction for environment for global warming alleviation in learning process. In other words, the students' achievement scores earned from the post-test scores were higher than from pre-test scores. Saenggaew, et al. (2011: 47) examined student's achievement scores after learning via the Computer Assisted Instruction (CAI) lesson entitled Earth and Space Science. It was found that the achievement scores after learning via the CAI lesson were significantly higher than that before using the learning the CAI lesson ($p<0.05$). Manisri (2011: 48) and Grajadthong (2012) also mentioned that after using the Computer-Assisted Instruction in learning process students' post-test scores were significantly higher than their pre-test scores.

Table 3: Students' satisfaction towards knowledge gained from the digital instruction for environment for global warming alleviation

Topics	$(\bar{x})$	SD
1. Students recognize energy and electric appliances on a daily basis.	4.45	0.60
2. Students know the cause of global warming.	4.48	0.60
3. Students know how to use the vehicles and the use of renewable energy.	4.20	0.72
4. Students know the effects of global warming.	4.50	0.64
5. Students know how to help reduce global warming.	4.55	0.60
Total	4.44	0.46

Table 3 indicates that, overall, the students' satisfaction on knowledge gained was at "good" level (Mean = 4.44, SD = 0.46). Based on data analysis, the students' satisfaction on know how to help reduce global warming was at the highest level (mean = 4.55, SD = 0.60), followed by they know the effects of global warming (mean = 4.50, SD = 0.64), know the cause of global warming (mean = 4.48, SD = 0.60), recognize energy and electric appliances on a daily basis (mean = 4.45, SD = 0.60), and lastly know how to use the vehicles and the use of renewable energy (mean = 4.20, SD = 0.72).

Table 4: Students' satisfaction towards the digital instruction for environment for global warming alleviation

Topics	$(\bar{x})$	SD
1. Students like cartoon characters.	4.45	0.75
2. Students like scenes and color of cartoon.	4.53	0.55
3. Students like the storyline of a cartoon.	4.43	0.71
4. Students like speech and music of cartoon.	4.45	0.68
5. Students are happy and have fun to watch cartoon.	4.58	0.59
6. Students can learn in a limited time.	4.43	0.71
7. Cartoon helps students understand the subjects.	4.43	0.68
8. Cartoon encourages students to be more interested in learning.	4.60	0.63
9. It is easy and not complicated to access to each cartoon story.	4.65	0.62
10. Use menu is readable.	4.60	0.50
Total	4.51	0.44

Table 4 reveals that, overall, the students' satisfaction with digital instruction was at "high" level (Mean = 4.51, SD = 0.44). From the result above, the students found that the digital instruction for environment for global warming alleviation is easy and not complicated to access to each cartoon story, and was at the highest level (Mean = 4.65, SD = 0.62), followed by cartoon encourages students to be more interested in learning (mean = 4.60, SD = 0.63), use menu is readable (mean = 4.60, SD = 0.50), students are happy and have fun to watch cartoon (mean = 4.58, SD = 0.59), students like scenes and color of cartoon (mean = 4.53, SD = 0.55), students like cartoon characters (mean = 4.45, SD = 0.75), students like speech and music of cartoon (mean = 4.45, SD = 0.68), students like the storyline of a cartoon (mean = 4.43, SD = 0.71), students can learn in a limited time (mean = 4.43, SD = 0.71), and lastly cartoon helps students understand the subjects (mean = 4.43, SD = 0.68).

Multimedia learning leads to strong communication process and innovative methods of learning and teaching process (Naresh and Bhanu Sree Reddy, 2015: 485). In light of above finding, most students currently learn more from media which helps them perceive actual information, understand, and develop knowledge and good attitude (Ruengwanich, 2012: 42). Naresh and Bhanu Sree Reddy (2015: 489) mentioned in his research on current trends in e-learning and future scenario that the learners were satisfied with the e-learning process. Because the enhancement of technology helps e-learning simpler and the users have more choice. Panchan (2012: 14) also found that learning instruction reflects the potential and the readiness of teaching and learning. This is consistent with research of Saenggaew, et al. (2011: 47) which found that students showed satisfaction in the CAI lesson entitle: Earth and Space Science at high level. Manisri (2011: 48) and Grajadthong (2012) stated that using the CIA in learning process could stimulate learners' motivation and self-learning. They had fun and enjoyed learning.

CONCLUSION

The result from the study reveals that the digital instruction for environment for global warming alleviation stimulates students' attention and enhances their knowledge on environmental issues. Using of digital instruction encourages students in learning, helps them gain sufficient knowledge about energy conservation and the seriousness of environmental problems, increase their understanding regarding to energy and power, and raise their awareness and attitude on environmental issues and global warming alleviation, which will contribute to energy conservation and environmental behavior. This suggests that the digital instruction for environment for global warming alleviation should be widely published in schools and on e-learning. Teachers can use the digital instruction for teaching. Moreover, students can use the digital instruction for learning anytime and anywhere they want.

It is also recommended that digital instruction in the context of environment and environmental conservation for learners in different ages should be developed. Effective digital instruction can improve students' achievement, motivate and encourage learners' motivation and a self-learning effectively. Therefore, digital instruction should be created and developed as instruction tools for others subjects as well.

ACKNOWLEDGEMENT

The authors would like to acknowledge financial support from the National Research Council of Thailand. Any errors are the responsibility of the authors.

REFERENCES

Adam, B., Wiredu, A., & Appiah, M. (2015). Cost Benefit Analysis of Climate Change Adaptation Strategies on Soil and Water Conservation Methods in Northern Ghana. In Book of abstracts of the *Tropentag 2015 : Management of land use systems for enhanced food security - conflicts, controversies and resolutions*, 52.

Al-rahmi, W., Othman, M., & Yusuf, L. (2015). The Effectiveness of Using E-Learning in Malaysian Higher Education: A Case Study Universiti Teknologi Malaysia. *Mediterranean Journal of Social Sciences*. Mediterranean Journal of Social Sciences, 6(5) S2, 625-637.

Ariratana, W. (2010). The Development of Learning Management Model Focusing on Thinking Skills in the Basic Education Curriculum, B. E. 2544. *International Journal of Education*, 33(1), 25-34.

Chunkao, K. (1993). *Environmental Education*. Bangkok: Aksornsayam Publishing, Economic and Social Commission for Asia and the Pacific, 30 Sep – 2 Oct 1997. Department of Environmental Quality Promotion, Ministry of Science, B.E. 2540-2544.

Grajadthong, S. (2012). The Development of Computer Assisted Instruction : Game Type Subject Basic of Computer on Component of Computer for Mathayomsuksa 2 Students of Sriprachan "Methipramuk" School, Suphanburi Provice. *Veridian E-Journal Science and Technology Silpakorn University*, 5 (2), 193-210.

Ilechukwu, L. (2014). Assessment for the Improvement of Teaching and Learning of Christian Religious Knowledge in Secondary Schools in Awgu Education Zone, Enugu State, Nigeria. *Journal of Education and Practice*, 5(32), 35-43.

Jahi, J. M., Arifin, K., Aiyub, K., & Awang A. (2009). Development, environmental degratation and environmental management in Malaysia. *European Journal of Social Sciences*, 9(2), 257-264.

Jittisak, U., & Jinwan, W. (2015). The Development of Computer Assisted Instruction Lessons in Mathematics on Fraction to Enhance the Logical Thinking Skills for Pratomsuksa 6 Students. In Proceedings of the *INARCRU III International Academic & Research Conference of Rajabhat University*, 119-128.

Manisri, T. (2011). *The Developing of the Computer-Assisted Instruction in IEG320 Probability and Statistics for Engineer*. Research Report. Industrial Engineering, Faculty of Engineering, Sripatum University.

Naresh, B., & Bhanu Sree Reddy, D. (2015). Current Trends in E-Learning and Future Scenario. *Mediterranean Journal of Social Sciences*, 6(5), 484-489.

Panchan, W. (2012). *Readiness of Instruction in Course HRD 3109 Principles of organizational Development*. Classroom Research Report. Faculty of Human Resource Development, Ramkhamhaeng University.

Pasawano, T. (2013). Edutainment: New Trend in Education with Focus on Entertainment. *Valaya Alongkorn Review*, 3(2), 159-167.

Praneetham, C. (2015). State and Needs in Using Digital Instruction for Environmental Subject of Primary Schools in Surat Thani Province. In Proceedings of the *17th International Academic Conference*, Vienna, 333-338.

Praneetham, C., & Leekancha, I. (2015). Inspiration and Consumption Behavior of Consumers for Enhanced Food Security Management. *Mediterranean Journal of Social Sciences*, 6(6) S2, 453-459.

Praneetham, C., & Thathong, K. (2012). Attitudes and Behaviors of High School Students in Vientiane, Lao People's Democratic Republic, towards the Environment. *European Journal of Social Sciences*, 35 (1), 5-12.

Ruengwanich, P. (2012). *Using of Technology for Knowledge Management of Bachelor of Arts Program: Human Resource Development, Ramkhamhaeng University*. Classroom Research Report. Faculty of Human Resource Development, Ramkhamhaeng University.

Saenggaew, S., Narapirom, S., & Jansawang, N. (2011). Development of Computer Assisted Instruction (CAI) Lessons Entitled Earth and Space Science, the Science Learning Substance, for 6th Grade Education. *Rajabhat Maha Sarakham University Journal*, 5(1), 39-48.

Sher, A. (2009). Assessing the Relationship of Student-Instructor and Student-Student Interaction to Student Learning and Satisfaction in Web-based Online Learning. *Journal of Interactive Online Learning*, 8(2), 102-120.

Stapp, W.B. & Dorothy, A. (1981). *Environmental Education Activities Manual*. Michigan: Thomas Shore Inc.

Thiengkamol, N. (2011). *Environment and Development Book 1*. Published 4th Edition. Bangkok: Chulalongkorn University Press.

Vinokurova, N., Nikolina, V., Shevchenko, I., & Efimova, O. (2015). A Coevolutionary Model of Environmental Consciousness Development among School Children on the Basis of Sustainability Concepts. *Mediterranean Journal of Social Sciences*, 6(6) S2, 315-324.

Xu, L., Shen, J., Marinova, D., Guo, X., Sun, F., & Zhu, F. (2013). Change of Public Environmental Awareness in Response to the Taihu Blue-green Algae Bloom Incident in China. *Journal of Environment, Development and Sustainability*, 15, 1281-1302.

E- Learning of Andalusian University's Lecturers. Gender

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ABSTRACT
This study forms part of the research project: "*Use of eLearning in Andalusian Universities: current status and analysis of good practice*". Our research focuses on two fundamental areas: firstly, the Virtual Andalusian Campus (VAC) as defined in the Digital University project set up by the Andalusia's Regional Administration, and secondly an assessment of the technical and didactic potential of Learning Management Systems (LMS) for the teaching staff at these universities. The research was ndertaken using a quantitative methodology hich collected and analysed data through questionnaires to find out how eLearning is used by 1302 lecturers of different level of six different Andalusian´s university, and to assess their levels of satisfaction with it. The university teaching staff demonstrated positive attitudes towards the e-learning and b-learning process, the methods used, the support offered by the university, and the development programme. The research demonstrates the success of the programme, and shows that it promotes diversity within the university by making use of a variety of personal and professional factors. It also confirms that the majority of teaching staff at the universities do not consider the use of different platforms to be a problem, and that the success of the experience is dependent on the support and attitudes of the university. We found significant differences between the lecturers in terms of gender in two areas: male lecturers had more knowledge of the tools, and female lecturers made more use of them.

Keywords: Higher education, faculty training, e-learning, learning management system, use ITC, gender.

INTRODUCTION
There is no doubt that e-learning has become one of the central points of university education in recent years. To a certain extent, we could say that it has been "institutionalized" in all universities (Aguaded & Diaz, 2010). For its strengthening, the European Union launched two initiatives: the "eLearning Action Plan" and the "eLearning Program." The objectives of these initiatives are aimed at providing infrastructure to institutions and the development of training for teachers (Uzumboylu, 2006).

Some of the results of these initiatives are presented in the *1st European e-learning Measurement* developed by Cross knowledge, Fefaur & Ipsos (2011), where e-learning strategies used in six European countries (France, UK, Spain, Italy, Belgium and The Netherlands) are ranked as training tools. The most important conclusions that derive from this document are: 1st) An European pattern in e-learning utilization can be stated as a fact. Furthermore, a common system of presenting and applying e-learning courses is shared by them all, regardless of maturity and specific cultural standards; 2nd) On behalf of e-learning growth, it can be argued that this training tool is involved in a widening process. The survey shows that the greater the e-learning use, the higher its future development perspectives, especially with an increase of smart devices; and 3rd) It should be highlighted that blended learning is the most requested format, together with this growing tendency in e-learning use.

Is why To a certain extent, we can say that network-based training has become a more and more popular form of teaching in higher education, thanks to the ongoing advances of the internet.

However, much of the research has been conducted in order to study the technical factors and the type of platform used instead of learning models for use.

A systematic search of the research literature from 1996 through July 2008 identified more than a thousand empirical studies of online learning (Means, Toyama & Murphy, 2009). Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size. As a result of this screening, 50 independent effects were identified that could be subjected to meta-analysis. The meta-analysis found that, on average, students in online learning conditions performed modestly better than those receiving face-to-face instruction. The difference between student outcomes for online and face-to-face classes was larger in those studies contrasting conditions that blended elements of online and face-to-face instruction with conditions taught entirely face-to-face. Analysts noted that these blended conditions often included additional learning time and instructional elements not received by students in control conditions. This finding suggests that the positive effects associated with blended learning should not be attributed to the media, per se.

Tweddell (2007)'s research on e-learning shows that technical disadvantages are easier to overcome than the lack of communicative skills. Communication errors tend to create serious problems that technology cannot solve. These obstacles deal with problems related to the unsatisfactory role performed by teachers as trouble-shooters, fostering facilitators and communicators in digital environments.

In this sense the European Commission's Directorate-General for Education and Culture (PLS Ramboll, 2004) has drawn attention to the fact that research should take a more pedagogic and didactic direction and move on from the basic technological arguments.

Hence and recently, a number of researchers have conducted investigations on the use made by teachers and students of e-learning. (Pullen & Snow, 2007; Duart et al, 2008; Lu & Chion, 2009; Means et al, 2009; Ginns & Ellis, 2009; Cabero, 2010; Osorio, 2010; Muñoz & González, 2010). These investigations have obtained a number of conclusions such as the fact that both teachers and students are very satisfied with virtual learning systems, performance levels are positive, there is a preference for a hybrid model that combines the virtual personal assistance with study and that teachers makes a limited use of the potential that the Learning Management Systems offer.

E-LEARNING: LECTURERS AND STUDENT SATISFACTION

Many researches (Aguaded & Díaz, 2010; Cabero, 2010; Ellis & Goodyear, 2010; Ginns & Ellis, 2009) show a students' positive attitude and self-efficiency towards e-learning. Peng et al (2006) point out that the students are bound to consider e-learning as a useful tool – a useful technology. They say there are differences in university students' attitude and perception towards it depending on their sex; male students tend to have more positive views than female ones. Moreover, they argue that students who perceive e-learning as a leisure activity tool show better and more independent communicative skills than others who only use e-learning as a productivity technological implementation.

Conclusions related to the quality level perceived by students who took one or more e-learning courses are presented by Jung (2011); he identifies certain aspects to assess such as: Interaction, Assistance, Institutional Quality Assurance, Credibility, Information and Publicizing, Learning Tasks, etc. Finding out that some such as, for example, technology assistance, contents and rating did not seem to be important for the students. Some variables like the students' cultural level, their characteristics or the e-learning course design could be considered responsible for this.

According to Ellis & Goodyear (2010), it could be said that some of the most adequate e-learning strategies for a good acquisition in this kind of environment might be: a) learning through discussion (sharing a learning community); b) research work learning (it offers resources to develop research activities). They come to the conclusion that students usually feel rather satisfied with their e-learning performance.

In relation to lecturers, the work of Bollinger & Wasilik (2009) gives us a more specific account of the factors which contribute to **lecturers' satisfaction** with the incorporation of e-learning. These are detailed as follows: a) *Factors relating to the student*, it provides access to education for a more diverse student population; opportunities for students to take part in highly interactive communication with lecturers and with fellow-students, etc…; b) *Factors related to teachers*, can encourage positive results in students, poses an intellectual challenge and promotes interest in the use of technology, research and collaboration with colleagues, etc…; c) *Factors related to the institution*, lecturers' satisfaction is generally high when the teaching institution has policies regarding online education which support the college. The main barrier to lecturers adopting online

learning is that they overestimate the work involved, because they think the workload will be greater than for traditional courses.

At the same time, it is worth noting that a number of studies show that one of the main problems we face in incorporating e-learning is in **training and enabling teaching staff** (Blázquez & Alonso, 2009; Cabero, 2010; Romero, 2011), and that this training should be broader than mere technological components and should aim towards a more didactic approach. A number of studies demonstrate that technical obstacles are much easier to overcome than lecturers' lack of communication skills in these environments (Tweddel, 2007).

Bawane & Spector (2009) assert that the teachers performing online must assume a multidimensional role and are urged to integrate a range of different and numerous competencies. They also underline the fact that the teaching competencies required derive from the context in which the teaching is performed: the characteristics of the training program, the specific role of the teacher, and the financial, functional, and human resources available (e.g., the equipment of administrative staff, designers, technicians, etc.). Some researchers, such as Kreber & Kanuka (2006; quoted by Baran, Correia, & Thompson, 2010), indicate that virtual education environments promote the exploration of new teaching approaches, derived from enhancing collaborative work or practices which incorporate social learning.

In our context Muñoz, González & Hernández (2013) indicate the need for identify the roles and competencies of teachers performing in virtual environments is crucial to higher education institutions in order to build a common frame for teaching and training initiatives. One of the goals of their study is to identify and systematize teacher's roles. Results reveal that content drafting is the aspect in which the subjects declare the highest level of proficiency as opposed to assessment. Teachers also appear to be willing to improve their training, being aware of the changes and requirements entailed by e-learning.

Regarding gender aspects, Remmele & Holthaus (2013) research the co-construction of gender and technology, that is, the theory that the usage of and the attitude to certain kinds of technology are a way to "do" one's gender. Findings support the assumption that with the routinization of e-learning in higher education, e-learning loses its character as a technology. With the routinization of its usage, e-learning is becoming a gender-neutral tool with no outstanding technological appeal.

Finally, note results from Esterhuizen, Blignaut & Sellis (2013) on the perceptions of faculty members new to technology enhanced learning and the longitudinal observations of the e-learning manager during dedicated professional development in order to compile a socially transformative emergent learning technology integration framework for open and distance learning.

These and earlier findings underscore the importance of future studies to know the support of the institution faculty, the environment in which faculty have to address the realities of adopting; human factors relating to the adoption; concerns and reservations about the use; and continuing professional development needs, expectations, and motivators. Emphasizing that the sustainable integration of ICT into higher education institutions remains a major challenge for the adoption.

METHOD

The current research was undertaken as part of the Project to Investigate Excellence in Research Teams (Proyectos de Investigación de Excelencia en Equipos de Investigación) funded by the General Secretariat for Universities, Research and Technology (P07-SE-J02670). In this case, ten airn was to identify the ways in which teaching staff at universities in Andalusia use e-learning, and to evaluate these learning methods and their suitability for the European Higher Education Area.

The study gathered information on how our lecturers see the use of e-learning and b-learning in university education. To achieve this, we decided to send an online questionnaire to teaching staff who were undertaking e-learning and b-learning activities in a number of universities in Andalusia during the academic term 2013-14.

To compile the questionnaire, we followed the steps outlined below:

a) A review of questionnaires created for different projects to research lecturers' views on internet-based learning.
b) Creating the first version of the questionnaire.
c) Amendments to the questionnaire by the research team and experts.
d) Creating the second version of the questionnaire.

The definitive version was sent out in the first term of 2013 and consisted of 21 questions with a variety of typologies, including multiple choice, double-barrelled questions (yes/no); rating scales and open questions.

The questionnaire was sent out by internet and was sent to all teaching staff at the various universities. We decided to send it out online for the following reasons: to obtain information from a large number of people; low distribution costs; it could be filled in when the respondent wished; fast, simple coding; data protection and the ability to avoid coding errors.

The research sample was made up of 1.302 lecturers at the universities of Málaga (f=3, 0.2%), Cádiz (f-276, 21.2%), Huelva (=93, 7.2%), Jaén (f=45, 3.5%), Pablo de Olavide (f=195, 15.0%) and Sevilla (f=681, 52.4%). Percentages for male and female lecturers were fairly equal (f=696 – 53.6% male) and (f=603 – 46.4% female), with an age range of 31 to 50 years.

Figures 1. Location of the study Andalusia provinces within Europe.

To complete these details of the sample, we wish to point out two factors: the first is that the vast majority were teaching a subject using virtual methodology (f-546, 45.5%), gradually reducing in number: two (f=396, 33.0%) and three (f=258, 21%). Secondly, we were told that they had only recently become involved in the field of e-learning, in the previous academic term, in fact (f=540, 45.0%). We should also bear in mind, however, that a large number of teaching staff (f=483, 40.3%) had already spent between two and four years developing virtual learning activities with their students.

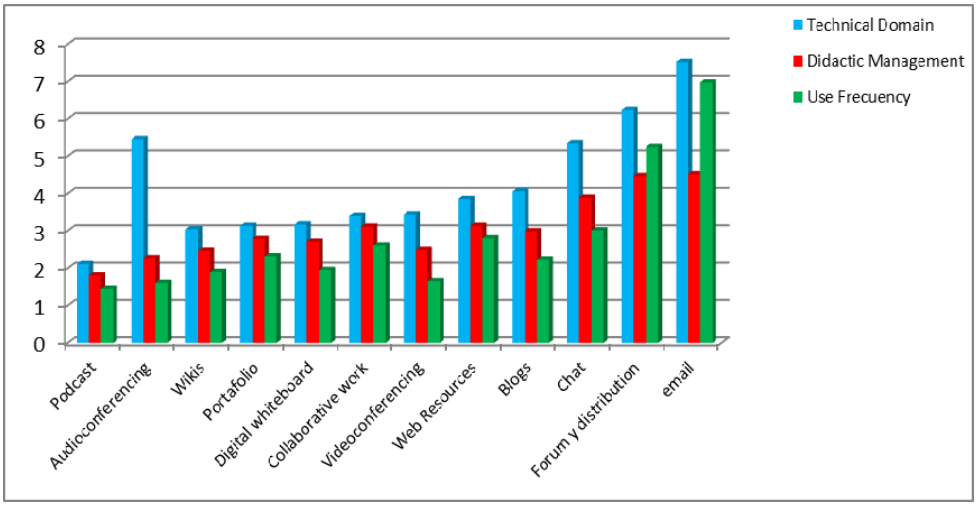
RESULTS

Regarding the extent to which they used the virtual platform provided by the university in their teaching, on a scale of 1 (very little) to 8 (a lot), the average was 5.10 with a standard deviation of 1.745. When asked about the extent to which they used the platform to its full technological potential, the average response was 4.69 with a standard deviation of 1.832.

As regards how often they used virtual learning, our findings were very similar for those who indicated that they used it “in all subjects” (f=606, 49%), and those who said they used it “according to the subject and the educational level of the students” (f=630, 51%). However, our teaching staff tended to combine sessions in lecture theatres with online training, and this applied to the vast majority of cases: (f=1182, 90.8%).

A large block of questions in the survey was aimed at finding out whether our lecturers considered themselves well prepared both technically and in terms of teaching, and how often they used the synchronous and asynchronous communication tools available to them in virtual learning. Once again, we gave them a scale of “1” (not at all) to “8” (very much). However, before approaching this, we made sure they were familiar with the tools we were going to ask them about. We found that the vast majority were familiar with the following: email (f=1,287, 99.5%), forums and distribution lists (f=1,239, 95.2%), chat rooms (f=1,222, 88.6%), blogs (f=894, 74.5%), digital whiteboard (f=732, 63%), collaborative work environments (f=678, 58.9%), category 2.0 web-based resources (f=771, 65.1%), videoconferencing (f=864, 72.7%), portfolios (f=609, 53.1%) and audioconferencing (f=648, 56.1%). We discovered that the area they were least familiar with was podcasts, where 72.4% told us they were unfamiliar with them.

As regards how competent they considered themselves to be in using technology as a resource and in using the various virtual learning tools available for educational use, (including how often they usethem), we were able to note the following factors from our findings. Firstly, there are a number of tools which the lecturers feel reasonably competent about using as technical instruments, such as email (7.53), forums and distribution lists (6.24), chat rooms (5.35) and blogs (4.06), in other words, synchronous or asynchronous communication tools. However, when we look at their ability to use them in teaching, and the frequency of use, only in two areas do they score higher than an average value of 4: email (4.52 and 6.98), and forums/distribution lists (4.47 and 5.25).



Figures 2. Frequency of Technical Domain, Didactic Management and total Use Frecuency.

It is striking how low the lecturers considered their competence to be in the educational use of some of the media, such as podcasts, audioconferencing, videoconferencing, digital whiteboards, portfolios and blogs. It also shows that the media they use most are email and forums/distribution lists.

Table 1.Means and standard deviations in the frequency with which teachers perform different with students in virtual learning.

	Means	Standard Dev.
Use a communication resource, such as forums, chat, email, ...	6,55	1,897
Develop some material in html, pdf, ... for the training of their students through the network.	6,73	1,873
Develop a hypertext format material or / and hypermedia to train their students through the network.	4,21	2,756
Develop audiovisual materials (audio clip or video clip) for the training of their students through the network.	3,01	2,412
Create blogs for their students	1,92	1,874
Create wikis for students	1,71	1,669
Create podcasts for their students	1,31	1,057
Develop webquest for students	1,89	1,889

We were also interested in finding out from the teaching staff about the activities involved in delivering network-based training. Out of the activities we asked them about, only three scored higher than the average of 4: “Have you ever used communication tools such as forums, chat rooms, email, etc?”, “Have you ever created material in html or pdf format, etc?” and “Have you created any material with hypertext or hypermedia for network-based teaching with your students?”

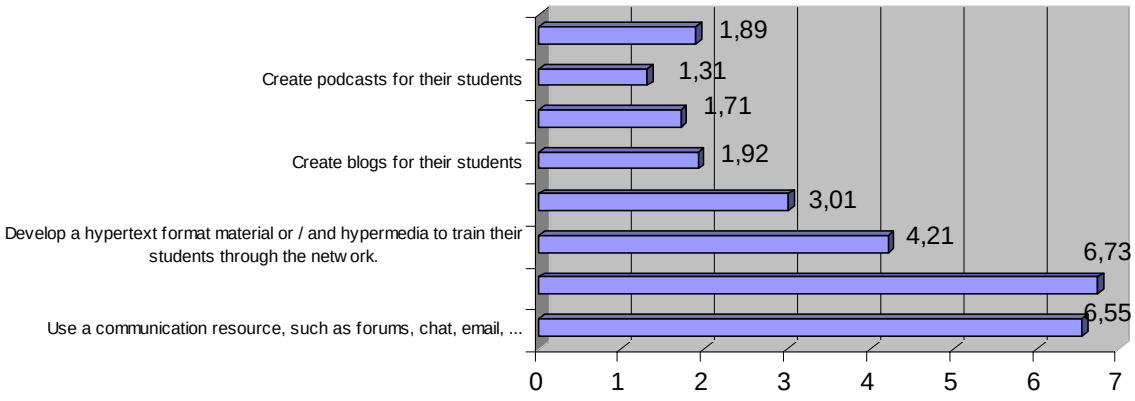


Figure 3. Activities with students in virtual training.

The following distribution emerged from the data gathered (highest scores first): **1)** Have you ever created material in html, pdf format, etc. for network-based teaching of students? (6.73); **2)** Have you ever used communication tools such as forums, chat rooms, email? (6.55); **3)** "Have you created any material with hypertext or hypermedia for network-based teaching of students?" (4.21); **4)** Have you ever created any audiovisual materials (audio or video clips) for network-based teaching of students? (3.01); **5)** Have you ever created blogs for your students? (1.92); **6)** Have you ever created Webquest activities for your students? (1.89); **7)** Have you ever created Wikis for your students? (1.71); **8)** Have you ever created podcasts for your students? (1.31)

The following table illustrates the lecturers' knowledge of virtual learning and their use of virtual learning activities.

Table 2. Knowledge of specific activities

		Frequency.	%.
Individualising teaching	Yes	873	70,3
	No	369	29,7
	Total	1242	100,0
Presenting or displaying materials	Yes	1209	96,2
	No	48	3,8
	Total	1257	100,0
Undertaking collaborative activities	Yes	726	59,2
	No	501	40,8
	Total	1227	100,0
Devising and setting problems: problem-solving methodology	Yes	855	68.8
	No	387	31.2
	Total	1,242	100.0
Working with project methodology	Yes	429	35.4
	No	783	64.6
	Total	1,212	100.0
Working with case study methodology	Yes	510	41.9
	No	708	58.1
	Total	1,218	100.0
Monitoring the completion and handing in of students' work	Yes	987	79.5
	No	255	20.5
	Total	1,242	100.0
Improving the arrangement and organisation of information, content and resources which are made available to students.	Yes	1,152	91.9
	No	102	8.1
	Total	1,254	100.0

Our findings show that the lecturers confirmed they were aware of the vast majority of these, but it is striking that a large number of lecturers said they were unfamiliar with two types of commonly-used network-based teaching, namely "Working with project methodology" (f=783, 64.6%) and "Working with case study methodology" (f=708, 58.1%).

With regard to the lecturers' reasons for using the activities we had asked them about, the average scores for the different options were as follows (highest scores first): "Presenting or displaying materials", (6.89); "Improving the arrangement and organisation of information, content and resources which are made available to students", (6.48); "Monitoring the completion and handing in of students' work", (5.55); "Devising and setting problems; problem-solving methodology", (4.60); "Undertaking collaborative activities", (4.15); "Working with case study methodology", (3.37) and "Working with project methodology", (3.15).

Table 3. Means and standard deviations of the use of virtual teaching activities.

	Means	Standard Dev.
Submit or display materials.	6,89	1,720
Engage in collaborative work.	4,15	2,642
Raise issues and propose. Problem solving methodology.	4,6	2,574
Working with the method of projects.	3,15	2,551
Working with the case study methodology.	3,37	2,554
Monitor the implementation and delivery of work by students.	5,55	2,548
Better manage and organize the information, content and resources that are made available to students.	6,48	1,984

We can also report that the vast majority of lecturers (76.1%) told us that they undertake no prior evaluation of their students' technical knowledge of the LMS provided by the university for virtual learning.

Those who answered *yes* tended to make use of the following activities: **a)** conducting a survey by questionnaire with the aim of collecting information on how much their students know about how the platform works (as we can see from the following), **b)** practical demonstration sessions in the first few days of the course and **c)** the aspects covered in these sessions are very varied, but they are generally focused and ensure the students know how the platform works. Some lecturers use the network's own synchronous and asynchronous communication tools to create learning activities.

With regard to whether or not they used the LMS to assess their students, responses once again tended towards the negative. More specifically, 69.3% said they did not. Those who replied that they did tended to use them in ways such as: "Creating tasks and dwell-time"; "Quantitative evaluation of tasks and problems."; "E-portfolios"; "Taking part in discussion and work forums"; "For testing"; "Marking assignments numerically; "Taking part in forums and work tasks"; "For exercises and distance work."; "Metacognitive strategies such as reflective diaries, portfolios, self-evaluation, self-regulation of learning through conceptual diagrams, self-observation and evaluation of the students' skills acquisition"; "Exams, questionnaires".

The brings us to point out different aspects: the diversity of strategies that are capable of using teachers, there is no orientation line network utilization as an assessment tool and to some extent seems to be some parallels in the translation to virtual contexts that have experience in the classroom.

When we asked the teaching staff if their university had given them access to any type of institutional help, most of them said that they had been given the following types of support: "Provision of equipment: computers, printers, etc." (Yes – f=873, 70.8%), "Advice on and/or training in the use of ICT in teaching" (Yes – f=1,005, 80.5%), and "Technical support if the machines break down or are not working" (Yes – f=840, 69.1%).

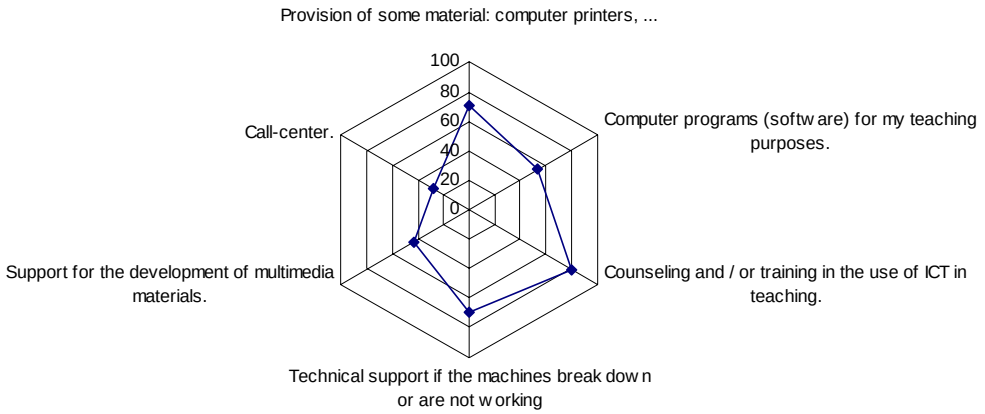


Figure 4. Institutional support received.

By contrast, most informed us that they were not made available a "call center" (No - f = 840, 72.4%), to resolve questions they might have. However, the results achieved in the response option "Support to resolve equipment failures or malfunctions," the stated above must be assumed with caution.

Regarding the ways in which the lecturers felt they had changed by using e-learning methodologies in their teaching, the vast majority of them indicated that there had been changes in terms of the different options open to them: “More regular changing and updating of the content of my teaching”; “Reflecting on the learning process my students use”; “Keeping up to date with new teaching methods” ; “Relations with students”; “Reflecting on my practice as a teaching professional” ; “Structure of the content delivered within the subject”; “Changing my role as a professional” and “Time management in a subject.” The lowest percentage was in “Most practical approach to a subject” where the proportion answering *yes* only reached 58.5% (f=714).

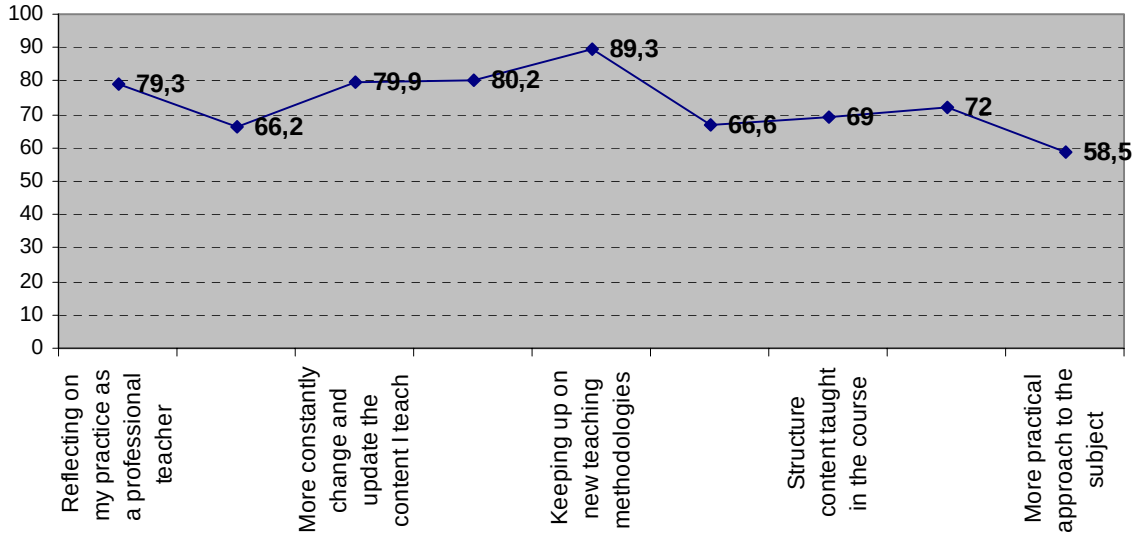


Figure 5. Areas where lecturers had changed their skills thanks to e-learning.

The last question in our survey was aimed at providing information on the types of training the lecturers had received for virtual teaching. The data show that they received two basic types of training: “Independent learning” (f=987), 38.51%) and “Training activities organised by the university” (f=933, 36.40%).

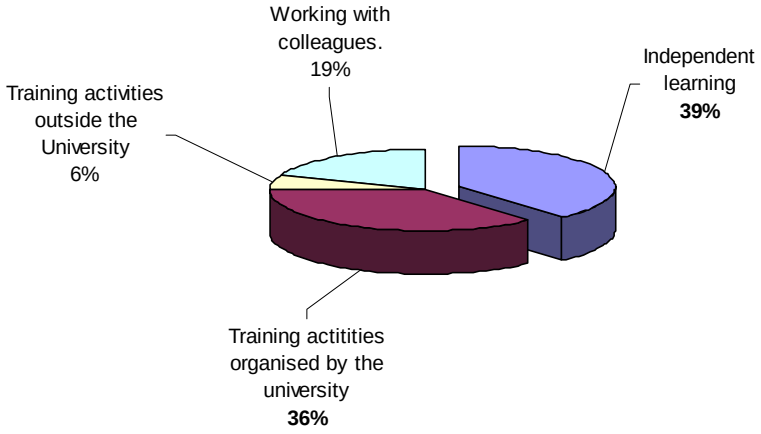


Figure 6. Where the training was acquired.

Having noted these comments, we shall now move on to test the hypothesis as to whether there were significant genders differences in the responses the lecturers gave. The hypothesis is as follows:

- H0 (null hypothesis): There are no significant gender differences between the lecturers with regard to the specific variables we analysed (alpha margin of error of 0.05).
- H1 (alternative hypothesis): There are significant gender differences between the lecturers with regard to the specific variables we analysed (alpha margin of error of 0.05).

The statistical test we shall use for this analysis will be the Mann-Whitney U test and the Chi-squared test, depending on the characteristics of the data we are comparing. This test is usual where two independent groups have been taken from the same population.

Firstly, we shall compare the extent to which the lecturers use the platform in delivering their teaching, and the extent to which they make full use of its technological potential. The values derived from the data allow us to reject the null hypothesis in both cases and consequently adopt the alternative hypothesis with an alpha margin of error of 0.05 and 0.01. In other words, we can say that "the extent to which the lecturers use the virtual learning platform provided by the university" (0.018) and "the extent to which they make full use of the technological potential of the virtual learning platform provided by the university (0.000) vary according to gender.

Table 4. Mann-Whitney - U for contrast gender of lecturers and the educational level of use of the platform and its technological possibilities.

	U de Mann-Whitney	Z	Nivel Sig.
The educational level using virtual training platform that offers the University	164322,000	-2,364	0,018
The extent to which the technological uses of virtual learning platform that offers the University	165901,500	-4,034	0,000

When the average range is analysed, we can see that female teaching staff achieve higher scores than their male colleagues or, in other words, that female lecturers indicate that they make greater use of the technical and learning capabilities of the virtual learning platform provided by the university than their male colleagues.

Table 5. Average ranges regarding the extent of the use of educational and technological possibilities.

	Gender	Average Range
The educational level using virtual training platform that offers the University	Woman	623,92
	Man	577,45
The extent to which the technological uses of virtual learning platform that offers the University	Woman	663,48
	Man	582,23

In analysing whether there were any significant differences in the lecturers' indications of their knowledge of the various technologies, the values derived from the data allow us to reject the null hypothesis in the following areas: blogs (0.000); wikis (0.000); podcasts (0.001); web-based resources 2.0 (0.30); videoconferencing (0.002); portfolios (0.022) and audioconferencing (0.001). We can therefore also say that there are significant gender differences within the teaching staff in terms of their knowledge of different communication tools. In all cases male lecturers scored higher than female lecturers.

Table 6. Chi-square test for knowledge of different ways depending on the gender of teachers.

	Chi-square	Nivel Sig.
Email	1,045	0,514
Forums and distribution lists	1,037	0,193
Chat	0,361	0,304
Blogs	17,493	0,000 (**)
Wikis	54,884	0,000 (**)
Podcast	10,913	0,001 (**)
Digital Whiteboards	0,717	0,216
Collaborative work environments	2,241	0,75
Recursos del contexto web 2.0	3,798	0,30 (*)
Videoconferencing	9,173	0,002 (**)
Portafolio	4,328	0,022 (*)
Audioconferencing	10,358	0,001 (**)

To find out if there are any significant gender differences between the teaching staff regarding their technological skills, their use of them in teaching and their use of different communication tools, we shall once apply the chi-square. The results allow us to reject H0 and adopt H1 with regard to technical skills, with an alpha margin of error of 0.05 or less, for the following communication tools: blogs, wikis, podcasts, category 2.0 web-based resources, videoconferencing, portfolios and audioconferencing. Once again, male lecturers scored higher than female lecturers. With regard to the use of this technology in teaching, H0 was rejected and H1 adopted for the following media: email, forums and distribution lists, chat rooms, blogs, wikis, podcasts and audioconferences. In both cases female lecturers had higher scores.

Regarding the use of technology, the results allow us to reject H0 and adopt H1 with an alpha margin of error of 0.05 or less for the following media and communication tools: email, forums and distribution lists, chat rooms, wikis, digital whiteboard, videoconferencing and audioconferencing. In this case, the results come out in favour of male lecturers for wikis, digital whiteboard, teleconferencing and audioconferencing. Female lecturers score higher for email, forums, distribution lists and chat rooms.

Regarding whether there were any significant gender differences within the teaching staff with regard to network-based teaching activities with students, the findings allow us to reject H0 and adopt H1, with an alpha margin of error of 0.05 or less for the following activities: "Creating material with hypertext and/or hypermedia for network-based teaching of students"; "Creating wikis for students" and "Creating podcasts for students".

Table 7. Mann-Whiteney-U for contrast gender of teachers and the performance of different types of activies. (*_Significant at alpha equals 0.05,**=significant at alpha equal to 0.01)

	U de Mann-Whitney	Z	Nivel Sig.
Use a communication resource, such as forums, chat, email,..	186682,500	-1,7880	0,074
Develop some material in html, pdf, ... for the training of their students through the network…	189481,500	-,8880	0,374
Creating material with hypertext and/or hypermedia for network-based teaching of students	164205,000	-3,774	0,000 (**)
Develop audiovisual materials (audio clip or video clip) for the training of their students through the network.	177327,000	-,896	0,370
Creating blogs for students	175990,500	-,164	0,869
Creating wikis for students	155929,500	-3,707	0,000 (**)
Creating podcasts for students	158350,500	-2,872	0,004 (*)
Creating webquest for students	165676,500	-1,316	0,188

In this case, we found that "Creating material with hypertext and/or hypermedia for network-based teaching of students" and "Creating wikis for students" were more common in male lecturers than female ones, while "Creating podcasts for their students" was used to a greater extent by female lecturers.

CONCLUSION AND DISCUSSION

Most of the lecturers deliver one or more subjects through virtual methodology, and most of them have only begun to use it recently, one or two academic years ago. This tends to be logical if we take into consideration that this type of learning has only really been promoted to any extent by the academic authorities in the last two years.

The lecturers tend to make fairly broad use of the Learning Management System provided by the university, but also recognise that they do not use it to its full potential. They tend to use virtual learning in combination with sessions in the lecture theatre, a system known as "blended learning". We believe this is due to two factors: they generally teach at universities where they are required to be present in person, and the preference for mixed models over totally virtual ones.

When it comes to the levels of knowledge the lecturers demonstrated with regard to specific synchronous and asynchronous communication tools that podcasts were the medium they were less familiar with. These data are very consistent with the findings of other studies by Duart et al. (2008), and Muñoz and González (2010).

However, if their knowledge can be considered adequate, the same is not true of their technical competence or their command of using the different synchronous and asynchronous communication tools and technical resources we suggested. The lecturers demonstrate a greater command, whether in terms of technology or use of the tools in teaching, of internet technologies that could be considered more traditional (email, forums, chat rooms, etc.). In the newer technologies, however, their training is fairly basic and inadequate. This is cause for concern in our view as it gives rise to a traditional model of e-learning known as category 1.0, which avoids all current developments in tools for interaction, collaboration and participation of students. It is therefore important to invest in training for lecturers which is more oriented towards the use of this technology in their teaching and not just training in how to use the LMS system, as we are learning more and more that the technical obstacles are easier to overcome than the ones involving didactic and communication skills (Tweddel, 2007).

With regard to the activities they used with their students, we found very little variance. In fact, the lecturers only tended to make broad use of two activities: "Creating material in html or pdf format for network-based teaching of their students," and "Using communication resources such as forums, chat room, email, etc." Also, they indicate that the resources they use are largely text-based, with very little use of visual, audio or audiovisual material.

The data we have received to date suggest that the lecturers tend to use technology-based distance learning environments more for information and for downloading or uploading materials than as an environment for a whole block of activities or collaborative work. At the same time, we could say that the activities carried out by the lecturers indicate that the e-learning model they are following is transmissive compared to a more participatory model or one where the students collaborate in the learning process, as the use blogs, wikis or treasure hunts would suggest.

It should be noted that very few lecturers do any preparatory work with their students to find out if they understand the LMS provided by the university. In any case, we should like to draw attention to the fact that training for students is a key factor: if they are not competent in using the system, it can introduce an element of anxiety and failure into a student's development, as noted by Tallent-Runnels et al. (2006).

It should also be noted that the vast majority of the lecturers indicated that they had received some form of help from their university in using virtual learning. The most common forms of help were as follows: "Provision of equipment: computer, printers, etc.", "Advice or training in the use of ICT in teaching" and "Technical support if the system breaks down or is not working."

For our lecturers, the fact that they had included virtual learning activities for their students had helped them bring about a series of methodological changes in the subjects they were teaching. In other words, we can say that using networks has not only helped our lecturers to incorporate a new methodology into their practice, it has also, and at the same time, redefined the things they were doing and helped them to make decisions in a series of directions.

The lecturers received a wide variety of training to help them take part in the experience. Common forms of training in new technology included "training activities organised by the university", "independent learning" and working with colleagues.

Finally, we have found that there were gender differences between our lecturers in terms of the knowledge they told us they had of a series of communication tools used in virtual learning.

A striking finding from our study is that there are gender differences between the lecturers with regard to technical competence and ability in using different communication tools in teaching, and male lecturers scored higher than female lecturers. However this was not the case with how often they used the various synchronous and asynchronous communication tools. Here, female lecturers rated higher than male lecturers, just as they did in the general sense.

We can summarise by saying that we found significant differences between the lecturers in terms of gender in two areas: male lecturers had more knowledge of the tools, and female lecturers made more use of them. For this reason, we do not believe that gender should be used as a significant and exclusive variable when the university puts measures in place for organising training plans or specific activities. (Romero, 2011; Remmele & Holthaus, 2013)

REFERENCES

Aguaded, J.I. & Díaz, M. (2010). La institucionalización de la teleformación en las universidades andaluzas, *Revista de Universidad y Sociedad del Conocimiento* (RUSC), 7, 1, Retrieved from http://rusc.uoc.edu/ojs/index.php/rusc/article/view/v7n1_aguaded_garcia/v7n1_aguaded_garcia

Baran, E., Correia, A. P., & Thompson, A. (2011). Transforming online teaching practice: Critical analysis of the literature on the roles and competencies of online teachers. *Distance Education,* 32, (3), 421-439. DOI:10.1080/01587910903236536.

Bawane, J., & Spector, J. (2009). Prioritization of online instructor roles: Implications for competency-based teacher education programs. *Distance Education, 30*, (3), 383–397. DOI:10.1080/01587910903236536.

Blázquez, F. & Alonso, L. (2009). Funciones de profesores de e-learning, *Pixel-Bit. Revista de medios y Educación*, 34, 205-215. Retrieved from http://www.sav.us.es/pixelbit/pixelbit/articulos/n34/14.pdf

Bollinger, D.U. & Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education*, 30, 1,103-116. Retrieved from http://cohortresearch.wiki.westga.edu/file/view/Factors+influencing+faculty+satisfaction.pdf

Cabero, J. (dir) (2010). Usos del e-learning en las *Universidades Andaluzas: estado de la situación y análisis de buenas prácticas*, Sevilla, GID.

Crossknowledge, Fefaur & Ipsos (2011). *1º Barometro del e-learning en Europa*. Retrieved from http:// www.dicampus.es/documents/download/414 pdf

Duart, J.M. et al (2008). *La Universidad en la sociedad red. Usos de Internet en Educación Superior*, Barcelona, Ariel.

Ellis, R. y Goodyear, P. (2010). *Students´ Experiences of E-learning in Higher Education. The ecology of sustainable innovation*, New York, Routldege.

Esterhuizen, Blignaut & Sellis (2013). Looking out and looking in: Exploring a case of faculty perceptions during e-learning staff development. *The International Review of Research in Open and Distance Learning. IRRODL*, 14, (3), 59- 80.

Ginns, P. & Ellis, R. (2009). Evaluating the quality of e-learning at the degree level in the student experience of blended learning, *British Journal of Educational Technology*, 40, 4, 652-663. Retrieved from http://0-onlinelibrary.wiley.com.fama.us.es/store/10.1111/j.1467-8535.2008.00861.x/asset/j.1467-8535.2008.00861.x.pdf?v=1&t=hq0xwyzm&s=a96cd80f9bfaf1ffe4520b870428fe212a8ecec6

Jung, I.S. (2011). The dimensions of e-learning quality: from the learner's perspective, *Education Tech Research and Development*, 59, 445–464. DOI 10.1007/s11423-010-9171-4.

Lu, H.P. & Chiou, M. (2010). The impact of individual differences on learning system satisfaction: A contingency approach, *British Journal of Educational Technology*, 41, 2, 307-323. Retrieved from http://0-onlinelibrary.wiley.com.fama.us.es/store/10.1111/j.1467-8535.2009.00937.x/asset/j.1467-8535.2009.00937.x.pdf?v=1&t=hq0y52du&s=db8c493dbf5da491ad947db856dfd1b7256eeb1b

Means, B. et al (2009). *Evaluation of evidencie-based practices in online learning: A meta-analysis and review online learning studies*, Washington, U.S. Department of Education. Retrieved from http://www.ed.gov/about/offices/list/opepd/ppss/reports.html.

Muñoz, P. & Gonzalez, M. (2010). Aplicación y uso de herramientas teleformativas por parte del profesorado de la Universidad de A Coruña, *Revista de Universidad y Sociedad del Conocimiento* (RUSC), 7, 1,

Retrieved from http://www.uoc.edu/ojs/index.php/rusc/article/viewFile/v7n1_munoz_gonzalez/v7n1_munoz_gonzalez.

Muñoz, P.C; González, M & Hernández, N. (2013). Pedagogical roles and competencies of university teachers practicing in the e-learning environment. *The International Review of Research in Open and Distance Learning. IRRODL*, 14, (3), 462- 487.

Osorio, L. (2010). Características de los ambientes híbridos de aprendizaje: estudio de caso de un programa de posgrado de la Universidad de los Andes, *Revista de Universidad y Sociedad del Conocimiento*,(RUSC), 7, 1, Retrieved from http://rusc.uoc.edu/ojs/index.php/rusc/article/view/v7n1_osorio/v7n1_osorio

Peng, H. et al (2006). University students' self-efficacy and their attitudes toward the Internet: the role of students' perceptions of the Internet, *Educational Studies*, 32, 1, 73–86. Retrieved from http://www.tandfonline.com/doi/.../03055690500416025

PLS Ramboll (2004). *Studies in the context of the e-learning initiative: virtual models of European Universities* (Lot1), PLS Ramboll, Denmark.

Pullen, J. & Snow, Ch. (2007). Integrating synchronous and asynchronous internet distributed education for maximum effectiveness, *Education and Information Technologies*, 12, 3, 137-148. Retrieved from http://link.springer.com/article/10.1007/s10639-007-9035-7#page-1.

Remmele, B. & Holthaus, M. (2013). *De-gendering in the use of e-learning.* The International Review of Research in opne and Distance Learning. IRRODL, 14, (3), 27-42.

Romero, R. (2011). Género en el uso del e-learning en las universidades andaluzas, *Profesorado. Revista de currículum y formación del profesorado*, 15,1. Retrieved from http.// www.ugr.es/~recfpro/rev151ART8.pdf

Tallent-Runnels, M.K. et al. (2006). Teaching courses online: a review of the research, *Review of Educational Research*, 76, (1), 93-135. Retrieved from http://0-rer.sagepub.com.fama.us.es/content/76/1/93.full.pdf+html

Tweddell, k. (2007). Qualifying online teacher-Communicative skills and their impact on e-learning quality, *Education and Information Technologies*, 12, (1), 41-51. Retrieved from http://0-download.springer.com.fama.us.es/static/pdf/295/art%253A10.1007%252Fs10639-006-9025-1.pdf?auth66=1389017611_bace859b27d4cb7f481b666003f80223&ext=.pdf

Uzumboylu, H. (2006). A review of two mainline e-learning projects in the European Union. *Educational Technology Research and Development*, 54, 2, 201-209. Retrieved from http://0-search.proquest.com.fama.us.es/docview/218020680/fulltextPDF/142C31F790B41DB14DE/7?accountid=14744.

Effectiveness of the Computer and Internet Literacy Project in Public High Schools of Tarlac Province, Philippines

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ABSTRACT
Evaluation is important to gauge the strengths, weaknesses and effectiveness of any activity. This study evaluated the iSchools Project implemented in the Public High Schools of Tarlac Province, Philippines by the Commission on Information and Communications Technology (CICT) in partnership with the selected State Universities and Colleges. Using survey questionnaires, data were gathered from the public high school teachers who were the recipients of the project. To supplement data from the survey, interviews with Principals and ICT Coordinators and actual observation of classes in the laboratory were also done. Findings showed that the beneficiary schools encountered problems in project implementation. These problems include hardware failure, difficulty on the use of software package, lack of follow-up on capability building, no available internet connection, limited access to the laboratory, and lack of repair/maintenance of the equipment in the laboratory. Despite these problems, however, the project was rated by the teachers as very satisfactory in terms of project administration, project components, and project delivery system. This implies that the project in general was effective in attaining its objectives which is ICT integration in education and to bridge the digital divide among public high school teachers.

Keywords: Computer and Internet Literacy Project, Educational Technology, Teacher Training, ICT Integration

INTRODUCTION
Technology nowadays has become prevalent in our society. It revolutionized the way people see and appreciate things especially in the fields of education. Teachers, parents and students now realize their significance in the quest for knowledge in this age of information technology. It makes the teacher's task easier while sustaining a high level of interest among their students.

Information and Communications Technology (ICT) in the Philippines is a milestone in the educational system. It opens a wide variety of opportunities both for teachers and students. Transferring of information, collecting of data and researching are the multiple benefits that people can get from ICT, but it still a dream for many. Most public schools in the Philippines have no complete ICT facilities and most teachers are not ICT literate which results in poor student and school performance.

The iSchools Project in the Public High Schools of Tarlac Province is one of the projects of the former Commission on Information and Communications Technology (CICT) which is now Information and Communications Technology Office (ICTO) which supports the efforts of the Department of Education to integrate ICT in education. Its goal is to contribute to the efforts of the Philippine government in bridging the digital divide by developing an educational digital network that equips public high school teachers with ICT literacy skills as well as access to relevant digital content and applications in education that they may use to make learning effective (iSchools Project Scope Plan).

The project focuses on integrating ICT in education towards strengthening classroom learning and instruction by expanding access to various sources of information. The project hopes to enhance the capability of public high school students in order to successfully compete with their peers for jobs and other opportunities in the expanding global knowledge economy.

Strategies for Implementation
The CICT and the selected State Universities and Colleges (SUCs) in the Philippines, joined hands to implement the iSchools Project, from Choosing a Pilot Site, Social Preparation Activities, Deployment of computers, Training of Trainers, and Progress Monitoring. SUCs implements iSchools at the beneficiary level as project coordinators, trainers and technical consultants. This partnership was done through the Memorandum of

Agreement (MOA) between CICT and SUCs concerned. The duties and responsibilities of SUCs as stipulated in the MOA are to conduct site inspections and evaluation of proposed beneficiaries; conduct community mobilization to beneficiaries; provide technical assistance in hardware deployment and ensure smooth internet connectivity of the schools; plan, conduct and manage educators training; and conduct project monitoring and evaluation to assigned schools.

Project Life Cycle

The iSchools Project starts with selection of a Pilot Site. The proposed beneficiaries were inspected on-site by the concerned SUC personnel and informed them about the project. It is followed by social preparation phase where the Principal, Teachers, Parents Teachers Association (PTA) Officers and other stakeholders of the selected beneficiary schools were invited for a project briefing. Details of the project are discussed including their counterpart responsibility. Then, community mobilizations were conducted on-site to discuss the projects with the teachers, students, parents, community officials and other stakeholders for their acceptance of the project. After which, sustainability planning workshop was conducted to the recipient schools to provide them knowledge and skills on how to sustain the project after its implementation. This was attended by the principal, teachers and PTA representatives. After the social preparation phase, deployment of hardware was done to the beneficiary schools. Pre-requisites for deployment are readiness of the laboratory room such as electrical wirings, paintings, door locks, grills, computer tables and chairs, physical security of the laboratory to safeguard the equipment and Memorandum of Agreements (MOA) signed by the concerned stakeholders for the sustainability of the project. After the deployment, capability buildings were conducted to the teachers of the recipient schools. Trainings include Computer & Internet Literacy Course (CILC) for twenty (20) teachers which was conducted on-site, Laboratory Management for the designated laboratory manager and assistant, Website Development Training for two teachers, Library Management for the designated librarian of the school, and ICT Integration on teaching Science English & Math. The last stage of the project was the Project Closure where Deeds of Donation of the laboratory were given to the beneficiary schools.

Project Components

Under the iSchools Project, schools were provided with 20 computer units, 1 server, 1 printer, 1 projector, 2 air-conditioning units, 1 wireless router, one year free internet connection, as well as relevant educators training in the use of ICT in education. Trainings include Computer & Internet Literacy Course (CILC) for twenty (20) teachers which was conducted on-site, Laboratory Management for the designated laboratory manager and assistant, Website Development Training for two teachers, Library Management for the designated librarian of the school, and ICT Integration in teaching Science English & Math. Strengthened partnerships with Local Government Units (LGU), PTA and other local educational stakeholders were also part of the components of the project.

The project had been implemented several years ago and evaluation of this project is an integral part of the development process to determine its effectiveness which can be the basis of improving future similar activities. Hence, this study was conducted to evaluate the effectiveness of the iSchools project in public high schools of Tarlac Province.

Statement of the Problem

This study was sought to answer the following questions:

1. How is the iSchools Project in Public High Schools of Tarlac Province evaluated in terms of its effectiveness?
2. What are the problems encountered in the implementation of the project?

Significance of the Study

The result of this study will serve as an assessment in determining the strengths and weaknesses of the project. The findings will be used as a benchmark in improving the implementation of similar projects in the future. The project administrators, beneficiary teachers and other stakeholders of the educational system will be benefited through the information that may be derived from this study.

The administrator of this project will make use of the findings a basis in improving aspects of project needing improvement. This includes improvement on the project management, project implementation, project components, capability building for teachers, utilization and maintenance of the laboratory and sustainability of the project. The beneficiary public high schools which include teachers, students, parents and community will utilize the findings in adapting measures to help the administrators in implementing the project successfully and to make use of the project in integrating ICT in education to produce quality, competitive and ICT literate graduates.

Scope and Delimitation

This study focused on evaluating the effectiveness of the iSchools Project in the Public High Schools of Tarlac Province, Philippines in terms of project administration, project components, project delivery system and project effectiveness. This study also determined the problems encountered by the recipient schools in the implementation and sustainability of the project.

METHODS AND PROCEDURE

This chapter presents the research design, description of the subjects, data gathering tools and procedure, and statistical treatments used.

Research Design

This study made use of the descriptive research design and the CIPP evaluation model developed by Donald Stufflebeam in 1971. The CIPP stands for the core concepts of the model: Context evaluation, Input evaluation, Process evaluation and Products evaluation. This model recognizes types of decisions encountered in education planning, programming, implementing of projects and recycling. This model is suitable for this kind of evaluation because in this concept, evaluation is for improvement of the project. [Stufflebeam 2002].

Respondents of the Study

The respondents of this study were the schools ICT coordinator, principal and 293 teachers of the recipient public high schools in the province of Tarlac. The sample was determined using Slovin's formula. The total population [N] was 1100 and the tolerable error [e] was .05. Using the given formula, the sample [n] was 293, and this was 27% of the total population. Respondent teachers were chosen randomly from each school and distributed in all learning areas.

Data Gathering Instruments

Survey questionnaires supplemented with interview of the ICT Coordinator and Principal and observation of classes were used as tools in gathering data. Survey questionnaires were prepared based on the project scope plan of the project. The instruments' content validity was established by seeking verbal and written feedback from the principal, teacher and psychometrician.

Evaluation questionnaires on ICT literacy for teachers and ICT integration were adopted from the CICT – HCDG assessment evaluation sheet on ICT Skills survey based on the National ICT Competency Standards [NICS] for teachers.

Data Analysis

The data gathered were tabulated, organized, analyzed and interpreted using appropriate statistical tools.

The data on the evaluation of project administration, project components and project delivery system were interpreted using frequency and means. The criteria on project administration, project components and project delivery system were rated using the following scale:

5 - *Excellent*
4 - *Very Satisfactory*
3 - *Satisfactory*
2 - *Poor*
1 - *Very Poor*

Weighted Means were interpreted using the following intervals and descriptions:

4.41 - *5.0* *Excellent*
3.41 - *4.40* *Very Satisfactory*
2.41 - *3.40* *Satisfactory*
1.41 - *2.40* *Poor*
1.0 - *1.40* *Very Poor*

The data on ICT Literacy were rated using the following Likert Scale adopted from the CICT NICS survey:

5 - ***Fully Mastered*** *[The function is achieved with full competence and could be confidently explain to others].*
4 - ***Mastered*** *[The function is used/done regularly and confidently].*
3 - ***Nearly Mastered*** *[The function is used/done occasionally but need further practice to be confident].*
2 - ***Partly Mastered*** *[Aware of the function/operation but have not experience using it].*
1 - ***Not Mastered*** *[Not aware and have not tried the*

function /operation/tool].

The WM were interpreted using the following intervals and descriptions:

4.41	-	*5.0*	*Fully Mastered*
3.41	-	*4.40*	*Mastered*
2.41	-	*3.40*	*Nearly Mastered*
1.41	-	*2.40*	*Partly Mastered*
1.0	-	*1.40*	*Not Mastered*

The data on ICT Integration were rated using the following Likert Scale:

5	-	*Always*
4	-	*Usually*
3	-	*Sometimes*
2	-	*Seldom*
1	-	*Never*

The WM were interpreted using the following intervals and descriptions:

4.41	-	*5.0*	*Always*
3.41	-	*4.40*	*Usually*
2.41	-	*3.40*	*Sometimes*
1.41	-	*2.40*	*Seldom*
1.0	-	*1.40*	*Never*

The level of client satisfactions regarding the components of the project were rated using the following Likert Scale:

5	-	*Very Highly Satisfactory*
4	-	*Highly Satisfactory*
3	-	*Satisfactory*
2	-	*Not Satisfactory*
1	-	*Very not Satisfactory*

The WM were interpreted using the following intervals and descriptions:

4.41	-	*5.0*	*Very Highly Satisfactory*
3.41	-	*4.40*	*Highly Satisfactory*
2.41	-	*3.40*	*Satisfactory*
1.41	-	*2.40*	*Not Satisfactory*
1.0	-	*1.40*	*Very not Satisfactory*

The WM in Project Effectiveness were presented using the following intervals and descriptions:

4.41	-	*5.0*	*Highly Effective*
3.41	-	*4.40*	*Moderately Effective*
2.41	-	*3.40*	*Effective*
1.41	-	*2.40*	*Fairly Effective*
1.0	-	*1.40*	*Not Effective*

Frequency counts and rank were used to present data on the issues and problems encountered by the teachers in the implementation of the project.

RESULTS AND DISCUSSIONS

Evaluation of the project includes project administration, project components, delivery system and project effectiveness. These are the factors that determine whether the project was implemented effectively and whether the goals were attained based on the evaluation of the recipients of the project.

Project Administration

Administration of the project was done by the CICT through its eQuality program for State University and Colleges (SUCs) in the Philippines. The CICT taps the services of the SUCs that signified interests to be part of the project. The data revealed that in terms of project administration, the CICT which is the prime mover of the project was evaluated as *very satisfactory* with a mean score of 4.09. This indicated that the CICT did well in managing the project as a whole and in conducting activities related to the project

The SUCs as co-administrator of CICT in implementing project in the school level was rated *very satisfactory*, obtaining a grand mean score of 4.18. This shows that SUCs with their pool of experts, performed well in implementing the project in the public high school level. This could be attributed to the fact that the CICT conducted training courses and trainers training as part of the project management activities, to equip the personnel with the necessary knowledge and skills in conducting activities related to the project.

In general, project administration was evaluated as *very satisfactory* with a grand mean score of 4.14. This shows that the project was implemented well by the CICT and its partner SUCs to the recipient public high schools. This could be because the CICT conducted trainers' training for all rollout courses to ensure that implementers have the necessary skills required to effectively implement the project in the school level. This is also to ensure the uniformity in approach, standard of modules and quality in implementation.

Project Components

The project components include the Provision of Laboratory, Capability Building for Teachers, and Local Educational and Institutional Support. Table 1 shows the evaluation of the project components as evaluated by the teachers of the recipient public high schools.

Table 1. Evaluation of the Project Components.

Project Components	Means	Description
Provision of Laboratory	4.25	Very Satisfactory
Capability Building for Teachers	3.53	Very Satisfactory
Local Educational Support	3.40	Satisfactory
Grand Mean	**3.73**	**Very Satisfactory**

As shown in the data, the provision of laboratory (Hardware, Software and Internet Connection) was rated *very satisfactory* having a composite mean of 4.25, the capability buildings for teachers conducted were rated *very satisfactory* with a composite mean of 3.53, while local educational support was evaluated *satisfactory* with a composite mean of 3.40. In overall, the project component was evaluated *very satisfactory* obtaining a grand mean score of 3.73. This can be attributed to the fact that the components provided to the beneficiary schools were relevant to their needs particularly the laboratory and training for teachers. Moreover, personnel involved in the project were properly trained and properly compensated. For these reasons, the recipient principals, teachers and other stakeholders became very cooperative and supportive of the project.

Project Delivery System

Table 2 shows the evaluation of delivery system of the project as evaluated by the teachers of the recipient schools.

Table 2. Evaluation of the Project Delivery System.

Delivery System	Means	Description
Utilization of the laboratory	4.25	Very Satisfactory
Laboratory usage in different learning areas	3.78	Very Satisfactory
ICT equipment in Education	4.46	Excellent
Productivity tools for education	3.43	Very Satisfactory
ICT integration in the laboratory	3.40	Satisfactory
Grand Mean	**3.86**	**Very Satisfactory**

The data show that the utilization of the laboratory was evaluated *very satisfactory* with a mean score of 4.25. This means that the laboratory and equipment provided were utilized by the teachers. The respondents revealed that the laboratory is utilized everyday or at least once a week. With regard to the laboratory usage in different learning areas, the respondents evaluated it *very satisfactory* having a mean score of 3.78. This means that the laboratory was utilized by teachers of different subject areas in teaching. The ICT equipment in education was evaluated *excellent* with a mean score of 4.46. This shows that the equipment given were very much suitable for ICT integration in education. The productivity tools in education were evaluated *very satisfactory* with a mean score of 3.43, which indicates that the Edubuntu and its application programs were relevant to the needs of teachers and students for education. The rating was quite low although very satisfactory because teachers need to shift from the use of proprietary software such as Microsoft into Edubuntu (open source) software. In terms of ICT integration in the laboratory, the evaluation was *satisfactory* with a mean score of 3.40. This indicated that the laboratory was an effective means in integrating ICT in education although the obtained score was not quite high. This could be because some teachers still find difficulty in integrating ICT in their lessons and can hardly shift from the traditional approach to the use of ICT.

In overall, the evaluation for project delivery system was *very satisfactory* with a grand mean score of 3.86. This revealed that the package given to the Public High Schools was utilized in accordance with its purpose of building ICT literacy and interest of public school teachers to integrate ICT in education. This can be attributed

to the observation that most of the teachers were eager to learn the use of ICT both for personal and professional development.

Project Effectiveness

Table 3 shows the evaluation of project effectiveness of the project as evaluated by the teachers of the recipient public high schools. The data presented in this table were based on the summary of points obtained in the evaluation of ICT literacy, ICT integration and client satisfaction which was transposed into effectiveness. The project was evaluated whether highly effective; moderately effective; effective; fairly effective and not effective.

Table 3. Evaluation of the Project Effectiveness.

Project Products	Means	Descriptive Rating
ICT Literacy	3.33	Effective
ICT Integration	2.77	Effective
Client Satisfaction	3.44	Moderately Effective
Grand Mean	**3.18**	**Effective**

The results show that the project was evaluated as *effective* in terms of ICT literacy and ICT integration with a mean scores of 3.33 and 2.77 respectively; while the client satisfaction was evaluated as *moderately effective* having a mean score of 3.44. In summary, the project effectiveness was evaluated as *effective* obtaining a grand mean score of 3.18. This result shows that the project in general was effective in attaining its objectives which is ICT integration in education and to bridge the digital divide among public high school teachers. This was proven by the result of evaluation on the project outcomes such as ICT literacy, ICT integration and client satisfaction.

Problems Encountered on the Laboratory

Table 4 shows the problems encountered on the provision of laboratory in the recipient public high schools. These problems encountered were classified into its sub components which are hardware, software and internet connection.

Table 4. Problems Encountered on the Learning Laboratory.

PROBLEMS ON THE LABORATORY	RANK
Hardware	
Not functional Workstations	2
Not Functional Air-conditioning Unit	4
Weak Router Signal	3
Uninterrupted Power Supply Failure	1
Software	
Corrupted Operating System	1
Internet Connection	
No Internet connection	1
Slow Internet Connection	2
Fluctuating internet connection	3

In the hardware related problems, majority was on Uninterrupted Power Supply [UPS] failure; followed by dysfunctional workstations; weak router signal; and not functional air-conditioned problems. Some of these problems were addressed by reporting them to the supplier when the units were still covered by warranty. However, after the warranty period, the repair and maintenance became the responsibility of the public high schools.

In software problem, the most common was the frequent bogged-down operating system. This was resolved by reinstalling the Edubuntu system which was the task of the designated laboratory manager who was trained to do the activity. This implied that there should be regular schedule of laboratory maintenance to avoid problems on frequent bogged-down operating system.

With regard to internet connection, the problems were no internet connection, slow internet connections and fluctuating internet connections. These problems were not within the control of the project because not all areas have internet service provider while some internet connections are dependent only on broadband signal hence, they are not stable and reliable.

Problems Encountered on Capability Building

Table 5 shows the problems encountered by the teachers of the recipient public high schools on various capability buildings conducted. The table shows that the major problem of the teachers was the lack of hands-on training on internet; it was followed by no echo training for teachers; no follow up training for teachers; lack of hands-on exercises; short training period for trainings; very fast pacing of training, and lack of skills learned on website development training. These problems occurred because of some situations which are beyond the control of the project implementers. According to the respondents, some were not given hands-on trainings on internet because during the schedule of the rollout, internet connection was not yet available. This is because in some areas, no internet service provider was available even if there were funds allotted by the project. This implied that the project implementers should look into these problems especially the hands on training on internet since this is critical for the teachers in searching various educational resources available in the web.

Table 5. Problems Encountered on Capability Building.

PROBLEMS	RANK
Lack of skills learned on website development	6.5
The Pacing of training was very fast	6.5
No follow up training for the teachers	3
Lack of hands on exercises	4.5
Short training period for the CILC	4.5
No echo training for other teachers	2
No hands-on training in internet	1

Moreover, the echo training was supposed to be initiated and implemented by the recipient schools to train other teachers also because during the trainings, only two [2] teachers per learning area participated together with the laboratory managers, principals and librarians. After the training, it was expected that the recipient schools should initiate and implement echo training to other teachers to equip them also with the knowledge and skills needed for ICT integration. However, some schools did not conduct re-echo training, hence, some teachers were not trained.

Moreover, the problem on no follow up training for teachers implied that teachers need more training to enhance their skills in using the ICT to improve their teaching skills. The lack of hands-on exercises and short period of training implied that for future project implementation, provision of more activities and longer period of training should be taken into consideration.

Problems Encountered on Utilization, and Maintenance/Sustainability of the Project.

Table 6 shows the problems encountered by the teachers of the recipient public high schools on utilization, maintenance and sustainability of the project. The table that most of the problems on utilization were on the difficulty of using Edubuntu. This was because it requires little adjustments on its functions and environment, and teachers were accustomed in using proprietary [Microsoft] software. It shows also that there were problems on insufficient number of computer units. The provision of 20 computer units and server was not enough for the public high schools to accommodate all students. The problem was not only on students but also on teachers because the higher the enrolment of the school, the higher the number of faculty the more computers are needed.

Table 6. Problems Encountered on Utilization, and Maintenance/ Sustainability of the Project

PROBLEMS	RANK
Utilization	
Limited access to the laboratory	3
No schedule on the usage of laboratory	5
Insufficient number of computer units	2
Difficulty on the use of Edubuntu	1
No available laboratory personnel	4
Maintenance/ Sustainability	
No Technical support from the Supplier	2
No available ink for the printer in the market	3
No Repair and maintenance cost provided	1
No Replacement of defective parts and units	4

Other problems on utilization were limited access to the laboratory for teachers, no available laboratory personnel, and no schedule on the usage of laboratory. The problem on limited access to the laboratory implied that teachers cannot use the laboratory because it was fully utilized or there was no proper scheduling. This was the task of the laboratory managers, to ensure that there should be functional schedule for the laboratory to give chance to all teachers who want to use it. The problem on no available personnel implied that there was no full time laboratory manager who can assist teachers in using the laboratory. This was because the designated laboratory managers were also teachers who handles various subjects and who do not stay in the laboratory. This implied that there should be full time laboratory personnel who will assist teachers in using the laboratory.

With regards to maintenance and sustainability of the laboratory, the common problem was the repair and maintenance cost. Repair was not a big problem because laboratory managers were trained in the activity however; replacements of parts such as mouse, keyboard, and ink for printer were the problems. Electric bills, payment of internet connection after the one year free connection, and payment for security personnel were also problems on the maintenance of the project. It shows also on the table that there were problems on technical support from the supplier. This implied that the school experienced problems on technical support from the supplier, according to the respondents, if there was assistance given; it took patience and perseverance to wait for their much delayed action.

Other problems of maintenance and sustainability include no available ink for the printer, and no replacement of defective parts and units. This implied that recipient schools experienced problems on the availability of ink for the printer in the market. They had difficulty looking for the ink since it was a new model. This situation made some of the schools resort to repair or replace some parts or units to make it functional and useful for ICT integration.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The iSchools Project was implemented and managed successfully in the recipient public high schools. The project components which include provision of laboratory equipment, and capability buildings for teachers were appreciated and fully utilized by the recipient public high schools in accordance with its purpose of building ICT literacy and interest among public school teachers in order to integrate ICT in education and improve the teaching and learning process. In general, the project was effective in attaining its objectives of bridging the digital divide and building ICT literacy and interest to the teachers of the recipient public high schools.

The problems encountered by the recipient public high schools related to hardware were: UPS failure, not functional workstations, not functional air-condition and weak router signal. In software problem, the most common was the frequent bogged-down operating system. In internet connectivity, the problems were: no available internet connection, slow internet connection, and fluctuating internet connection. In capability buildings, the problems were: no hands-on training in internet, no echo training for other teachers, no follow up training for teachers, short training period and lack of hands-on exercises. In the utilization of the laboratory, the problems were: difficulty on the use of Edubuntu software, insufficient number of computer units, limited access to laboratory and no available laboratory personnel. On maintenance and sustainability, the problems were: no technical support from the supplier, no available ink for the printer in the market, and no replacement of defective parts and units.

Recommendations

Based on the findings and conclusions of the study, it is recommended that project monitoring should be done regularly to keep track of the progress of the project and assist the schools in any problem related to the project. More durable, quality and cost efficient units/ equipment should be provided to lessen the problems of recipient school on repair and maintenance and electricity bills. Follow up training should also be conducted to the teachers to enhance their mastery of skills necessary for ICT integration. Moreover, the project should ensure that suppliers should respond immediately to the problems on repairs and replacement of parts and units which were covered by warranty to make the laboratory always functional for ICT integration.

REFERENCES

Albano, A. (2003). Introduction to Information Technology. Trinitas Publishing Inc. Bulacan, Philippines.

Bransford et al (2003). In enGauge 21st Century Skills. Accessed on March 2013 at http://www.ncrel.org/engaugeg/skills/21skills.htm.

Belanger, F. (2000). Evaluation and Implementation of Distance Learning: Technologies, *Tools and Techniques*, Herskey, PA: Idea Group Publishing.

Espino, A.N. (2004). *The Benefits of Information Technology.* JJ Printing Press. Philippines.

Flor, A. G. (2006). *Executive Summary of the Draft Final Report: Strategic Framework on Information and Communication Technology for Education (ICT4E) Under the Basic Education Sector Reform Agenda.* EDPITAF, Department of Education, Philippines.

Galano Jr., A.P. (2008). *Computer Education in the Second Congressional District of Pangasinan I Division: An Assessment.* Unpublished Masteral Thesis. Tarlac College of Agriculture, Camiling, Tarlac.

Gurung, W. (2000). *Utilization of Internet Technology Among Selected Educational Institutions.* Unpublished Doctoral Dissertation. Baguio, City.

Haddad, W.D. and Jurich, S. (2002). *ICTs for Education: Potential and Potency.* In Haddad, W.D. and Draxler, A. (Eds.) *Technologies for Education: Potentials, Parameters, and Prospects*. Paris/Washington: UNESCO and the Academy for Educational Development.

Hatta, Breeen, (2001). *Information Technology in the Learning Environment.* London. University of North London.

Holcomb (2002). *An Educators Guide to Evaluating the Use of Technology in Schools and Classrooms.* US Department of Education Office of Educational Research and Improvement.

Kumar, K.L. (2005). *Educational Technology. New Age International Ltd.* Publishers Philippines.

Novesteras, J. A. (2009). *Evaluation of the Blended Learning Program of AMA Education System.* Unpublished Doctoral Dissertation. Tarlac State University, Tarlac City.

Rodríguez, P., Nussbaum, M., López, X., & Sepúlveda, M. (2010). A Monitoring and Evaluation Scheme for an ICT-Supported Education Program in Schools. Educational Technology & Society,13 (2), 166–179. Accessed on August 2015 at: http://www.ifets.info/journals/13_2/14.pdf

Santos, Walfredo G. (2007). *Computer Education Program in Selected Private Secondary Schools in the Educational District, Division of Bulacan: An Evaluation.* Unpublished Masteral Thesis, Meycauayan College, Meycauayan, Bulacan.

Stufflebeam, D. (2003). *The CIPP Model for Evaluation: An update, a review of the model´s development, a checklist to guide implementation.* Paper read at Oregon Program Evaluators Network Conference, at Portland, OR.

UNESCO (2008). *Information and Communications Technology Standards for Teachers by the United Nation Educational Scientific and Cultural Organizations.* 7 Place de Fontenoy, 75352 Paris.

US Department of Education, (2000). *Evaluating the Technology Proficiency of Teacher Preparation Programs Graduates.* Washington, D.C.

US Department of Education (2004) in White, G. *Beyond the Horseless Carriage: Harnessing the potential of ICT in education and training.* Accessed on October 2006 at http://www.educationau.edu.au/papers/horseless_carriages_GW.pdf.

Velasquez, E.O. (2006). *The Integration of ICT in the Philippine Educational System. Lecture during the first ICT Division in Basic Education.* November 9-10.

Wagner, Daniel A., Bob Day, Tina James, Robert B. Kozma, Jonathan Miller and Tim Unwin. 2005. Monitoring and Evaluation of ICT in Education Projects: A Handbook for Developing Countries, Washington, DC: infoDev/World Bank. Accessed on August 2015 at: http://www.infodev.org/en/Publication.9.htm

E-Learning Capability Maturity Level in Kingdom of Bahrain

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ABSTRACT
Despite the effectiveness of using e-learning, educational institutions are still facing many challenges with the e-learning infrastructure and technical aspects, practices and capabilities, and improvement in learning outcome. Hence, a need for framework to benchmark the e-learning capability maturity level and measure the extent to what it is improving the learning processes and ensure improvements in student learning outcomes is raised. The current research is aim at assessing and identifying the e-learning maturity level of the universities in the Kingdom of Bahrain by adopting the e-learning Maturity Model (e-MM). The current state of e-learning in the Kingdom of Bahrain in terms of the drivers for the using e-learning, the technical challenges faced by the learners and level of satisfaction with the current e-learning systems will be investigated in attempt to consolidate the findings. A self-administrated questionnaire was adopted in which 400 surveys were distributed to the public university (University of Bahrain) and all private universities in Kingdom of Bahrain. The overall eMM figures demonstrate that universities in Kingdom of Bahrain both public and private reached an average level of achievement and performance in e-learning processes and developed reasonable capability maturity level on each dimension of the learning processes.

INTRODUCTION
Recently, e-learning considers as a critical element in the educational system which imposed an innovative shift in the learning environment (Nagarajan and Jiji, 2010). An effective implementation of e-learning can border the educational opportunities and enhance a positive attitude toward the learning process and helps students in developing skills they need for the 21st century (Phillips, et al., 2012). Despite the effectiveness of using e-learning, educational institutions are still facing a challenge with the rising cost of e-learning infrastructure, lack of e-learning practices and capabilities, and level of student achievement and improvement. E-learning should be efficient in utilizing the institute' resources while, effective in adding value to the educational delivering (Marshall and Mitchell, 2002). Thus, e-learning has to be seen as a platform for educating the students and improving the institute productivity and performance. E-learning is a complex system which needs a balance between technical issues like the creation, utilization and support of e-learning facilities and other organizational and pedagogical considerations (Jacobson and Wilensky, 2006). With such complexity assessing the investment of e-learning projects and the extent to what it improved learning outcome is not an easy task. Therefore, there is a need for an overall framework for guiding the adoption of e-learning and improving the learning processes to ensure improvements in student learning outcomes (Marshall and Mitchell, 2002).

E-learning has spread widely among the educational institutions and universities in Kingdom of Bahrain and has become one of the important strategic elements that are used in order to improve students' performance and skills, as well as educational outcomes (Jabli and Qahmash, 2013). Moreover, it has been noticed that most of the universities in Kingdom of Bahrain are adopting blending learning, in which traditional and e-learning are running in parallel; which means extra costs. Therefore, universities in Kingdom of Bahrain need to manage the investment of their e-learning by adopting a framework to assess and evaluate the effectiveness of their e-learning in improving the learning processes and enhancing student learning outcomes. While e-learning have been intensively discussed in the previous research, few studies have tackled the assessment of the capabilities and maturities of e-learning in Kingdom of Bahrain. The purpose of the current research is to assess and identify the e-learning maturity level of the universities in the Kingdom of Bahrain by adopting e-learning Maturity Model (e-MM). In addition, the current state of e-learning in the Kingdom of Bahrain in terms of the drivers for the using e-learning, the technical challenges faced by the learners and level of satisfaction with the current e-learning systems will be investigated in attempt to consolidate the findings. The findings of the research will provide the decision makers and managements at Kingdome of Bahrain and the Arabian Gulf Countries, as they are facing mostly the same situation, with a guideline for assessing their investment in e-learning projects and evaluating their capability maturity level in providing a success learning environment. Knowing the maturity level will helps in understanding the institution's strengths and points of improvement in the different learning

processes starting from that directly impact the pedagogical aspects of e-learning to that associated with the institutional planning and management. In turn, this critical information can be used at the executive level to plan for the next step for improving the e-learning projects and progress to a higher level of maturity to maintain a sustainable e-learning success.
The current paper is articulated into six sections including the introduction. Discussions on the E-learning in Kingdom of Bahrain and the e-MM were presented in Section 2 and Section 3, respectively. Section 4 talks over the research methodology and data collection. Section 5 presents the results of the research. The paper then concludes with Section 6.

E-LEARNING IN THE KINGDOM OF BAHRAIN

The Ministry of Education (MOE) in Kingdom of Bahrain is paying supplementary attention to the investment in learning process and infrastructure. The education system in Kingdom of Bahrain has started in 1919 by opening the first school for boys and in 1928 for girls. Later in 1930 schools in the country became more organized and managed by the government. With the development in the country, three higher education institutions have been opened in Kingdom of Bahrain, University of Bahrain with five colleges in 1986, Arabian Gulf University by Gulf Countries Cooperation Council (GCC) and the College of Health and Science in 1979 which provide specialized programs like general nursing, laboratory studies, radiography, pharmacy, and sport therapy (Shaker, 2000).

Bahraini government has strengthened efforts in the education field, as education minister Dr. Majed bin Ali Al Nuaimi (the minister of the ministry of Education) has mention in the 36th General Conference of (UNESCO) that Bahrain have successfully implement e-learning through the pioneering King Hamad Schools of the Future Project and recently some curricular has been switch to electronic lessons with collaboration (UNESCO). In the same content, the minister states that King Hamad Prize for the Use of Information and Communication Technologies in education has great impact in engaging numbers of researchers and encourage innovation in that field (Rafique, 2011). Kingdom of Bahrain is one of many Arab countries that adopted the online learning access tools in parallel with traditional teaching (Al-Musawi, 2014). With this new learning trend, most of the higher institutions have pursued the e-learning to enhance the learning and teaching outcomes. For instant, University of Bahrain-UOB play major role in shaping the students behavior toward using new techniques for getting knowledge. In such situation, instructors encourage students to use online materials and exchange ideas with their colleague which in turn leads to enhance the learning outcomes. The latest statistics in 2008 shows that 4800 students are using the e-learning in UOB that is include simple interaction through emails to Blackboard tools. ZAIN E-learning Center was open on 2004 to arrange e-learning foundation and boundaries; in associate with the center Wi-Fi access is available to all students and instructors to provide easy access anywhere any time. University of Bahrain always search for new trends in information technology that could improve the level of learning efficiency and effectiveness by using social networks and other collaboration tools to find the best ways through the available resources (Al-Ammary, 2012). On the other hand, Arab Open University (AOU) had a successful experience on adopting hybrid e-learning model (Mirza and Al-Abdulkareem, 2011). Mohammed (2010) has conducted a SOWT analysis over four universities includes: ASU, DELMON, AL-AHLIA and RUW. The study aimed at measuring students' altitude toward adopting e-learning and the ability of the academic staff in term of their technical knowledge and experience. The finding revealed that e-learning has a vital impact on enhancing the students learning and skills, increasing the level of communication and collaboration between peers and instructors, and imposing a positive attitude toward the learning process.

E-LEARNING MATURITY MODEL EMM

In most educational institutions, many decision makers and strategic planners are facing problems in evaluating and assessing the quality of e-learning projects. Evaluating such projects is not an easy task as it necessitates a balance between technical and learning process consideration (Marshall, 2010). E-learning is a strategic project that is adopted to impact the organization performance, improving the educational outcomes and enhance the students and users skills (Iskander and Daflous, 2013) not to operate just as an enabler for such impact. Therefore, education institutes need to adopt frameworks encompasses all aspect of e-learning or benchmarking process to be able to identify their projects' strengths and points of improvement (Petch et al 2007, Iskander and Daflous, 2013). Consequently, the need for a capability maturity model for e-learning has been raised. Using such model will increase the effectiveness of e-leaning and guarantee the desired learning outcomes [15]. Moreover, Marshall and Mitchell and Mitchell (2004) states that the lack of maturity framework for e-learning makes the comparison between educational institutions harder for planner. When such framework adopted, institutions will be able to compare and improve their learning processes (Penicina, 2011). The assessing e-learning using such framework provide guidelines for improving learning usability, reducing number of failure projects, and maintaining workflows process to assessment quality issues (Penicina, 2011). Petch et al. (2007) state that with well design framework numbers of educational issues can be declare and examined.

Previous literatures revealed that different models are available to measure the capability maturity model such as Capability Maturity Model (CMM). CMM proposed by the software engineering institution (SEI, 2004) is concerned on the problems that are related to the capacity of organizations to manage software development processes. The CMM for software characterizes a mature and capable software process. This model is currently applied to a number of industry sectors (Griffiths, 2005). This model consists of five stages for judging the maturity of software development processes of the institution (Marshall and Mitchell, 2002)b. Another model adopted to assess the capability level is the SPICE (Software Process Improvement and Capability Determination) which is a joint effort by the international standard for software process assessment, adds the approach for organizing the e-learning provision practices and processes into process areas (Griffiths, 2005). The main aim of these models is to provide the organization with a continuous development and improvement plan (Paulk et al., 1993). However, CMM and SPICE are not suitable for assessing the educational capability to engage in high quality processes that are able to re-create, extend and sustain with the development of the institute. Such assessment is essential for measuring the effectiveness of the institute in any particular area of works (Kaur, 2014). Therefore, the eMM (e-learning Maturity Model) was created by Stephen Marshall in 2004 by combining both CMM and SPICE (Petch et al. 2006). Combing CMM and SPICE as a basis for eMM provides the educational institute with a method or technique for improving process capability and assess their ability to perform their key learning process (Mitchell and Mitchell, 2004). This model targets the capability of institute to make sure that the design and implementation of the e-learning meet the stakeholder's vision and the overall desired outcomes. eMM measures the process maturity from multiple facets and assessing capability within each aspect (Marshall and Mitchell, 2004; Petch et al. 2006). eMM is distinguished by providing an identification of five categories of learning processes that is strongly connected to e-learning (Marshall and Mitchell, 2002)a. In step to further analysis of the concept Marshall take less resource to establish a primly set of practice for easer benchmarking (Marshall and Mitchell, 2002)b.

Within the eMM model the capability of institution is divided into five major categories or learning areas which replace the customer/supplier areas used in software engineering in SPICE model see Table (1). The learning areas are further divided into a set of thirty-five learning processes. These learning processes targets and affects the characteristic and the design of e-learning, as well as the execution of the delivered courses. Each process is selected on the basis of its necessity in the development and maintenance of capability in e-learning (Petch et al, 2007) which give the power to control the platforms and improve it in high standard and ensure the proper use of technology in the content of these courses (Zhou, 2012). The learning areas are used to measure the maturity of the e-learning.

Table 1.E-learning Maturity Model processes categories/Areas: source:Marshall and Mitchal (2002)a

E-learning Maturity Model: learning areas	
Process Category/area	**Brief Description**
Learning	Processes that directly impact on pedagogical aspects of e-learning
Development	Processes surrounding the creation and maintenance of e-learning resources
Coordination	Processes surrounding the oversight and management of e-learning
Evaluation	Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle
Organization	Processes associated with institutional planning and management

It has been noticed that most of the maturity models are based on measuring the progressive levels which implies a hierarchical model. With such structured model the capability is assessed and builds in a layered way (Marshall and Mitchell, 2002)a. Instead, eMM describes the capability of the processes from "synergistic perspectives". As such the institutes will be measured based on the extent to what it develop capability on each dimensions of the learning processes. As such, the institute will not deliver the desired outcomes, if the capability at the higher dimensions is not supported by capability at the lower dimensions.

Table 2.E-learning Maturity Dimensions: source: (Marshall and Mitchal, 2002)a

E-learning Maturity Model: Dimensions	
Dimension	**Focus**
5: Optimization	Continual improvement in all aspects of the e-learning processes
4: Managing	Ensuring the quality of both the e-learning resources and student learning outcomes
3: Definition	Defined process for development and support of e-learning
2: Planning	Clear and measurable objectives for e-learning projects
1: Delivery	Ad-hoc processes

Conversely, the institute will be ad-hoc, unsustainable and unresponsive to the institution changes and learner needs if the capability at the lower dimensions is not supported by the capability at the higher dimensions. The dimensions of the learning process are starting by the delivery at the lower level to optimization at the higher level as shown in Table (1). The first dimension (delivery) measures the formulation of the process feedback and the definition of the level to which the operation is known and realize across institution (Paulk, 1993). The second dimension of maturity is the planning, in which there is a link between well-defined goals and objectives and the validation of the learning process. Such association makes managing the process more effective and efficient and reproduced if successful (Kwak, 2002). The third dimension is the definition, in which predefined standers, polices and producers are used as well as a well-defined and structured process that should be work to produce desire outcome (Reitzig, 2003). The fourth dimension (managing) concerned about the overall control and management of the process implementation and the guarantees of the quality of the outcomes (Grottke, 2001). The last dimension is the optimization which is concerned about the extent to what capability measurement within other dimensions of the learning process is improved by using formal and systematical approach (Paulk, 1993).

RESEARCH METHODOLOGY AND DATA COLLECTION

The data sample of the current research is consisted of the users of e-learning systems (instructors) from all universities in Kingdom of Bahrain both private and public universities. Therefore, a stratified sampling was used in which two groups were identified public and private universities. In Kingdom of Bahrain there is only one main public university which UOB, while there are around ten private universities. Therefore, the first group consists of UOB only, while private universities consist of Arab Open University (AOU), Royal University for Women (RUW), Ahlia University (AU), The Kingdom University (KU), Applied Sciences University (ASU), Arabia Gulf University (AGU), Bahrain Polytechnic (BPT) and Royal College of Surgeons in Ireland (RCSI). The total population for instructors in each university has identified. Further, random samples were selected from each strata of the population as shown in Table (3).

Table 3.Sample size and sample distribution

	Public University	Private Universities									
	UOB	AOU	RUW	AU	KU	ASU	AGU	RCSI	BPT	AMA	Total Private
Population	880	25	32	120	28	65	58	39	86	62	515
Sample size	252	7	9	34	8	19	17	11	25	18	148

A total of four hundred (252 + 148) questionnaires were distributed to the instructors based on the sampling structure using both face-to-face and online survey. Only two hundred and fifty completed questionnaires were returned. The survey instrument provides a response rate of 62.5% which can be considered as high rate bearing in mind that many instructors, either from public or private universities, refused to answer the questionnaire either because they were very busy or they were not interested. Moreover, private universities like ASU and RCSI refused to distribute the questionnaires due to some regulation and policies. The survey instruments were developed by adopting the measurement proposed by Marshall and Mitchell [3]. As such measurements for capability of the university over 35 processes grouped into five major categories or process areas were developed, each process is dived in each dimension into practices as shown in Figure (1). Then each practice is assessed for each process for performance from (Not practiced/not adequate) to (fully adequate) as shown in Figure (1).

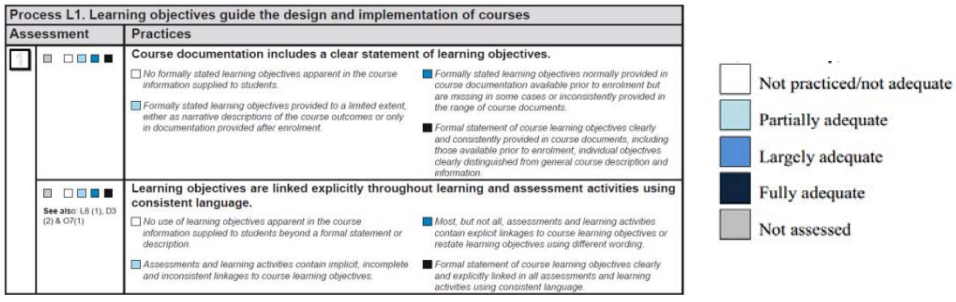


Figure 1.method for analyzing the E-learning Maturity Model, source: Marshall and Mitchell, 2004

DATA ANALYSIS AND RESULTS

THE CURRENT SITUATION REGARDING THE E-LEARNING IN THE HIGHER EDUCATIONAL INSTITUTIONS IN KINGDOM OF BAHRAIN

The following section presents results on the current situation regarding the e-learning in the universities in Kingdom of Bahrain. The current situation on e-learning was investigated from the usage, drivers, challenges and users' satisfaction of the e-learning. Table 4 presents results on the e-learning systems adopted by the universities in Kingdom of Bahrain. The results demonstrate that Moodle is the most LMS (Learning Management Systems) adopted by the universities. Moreover, it can be noticed from the results that most of the universities – both public and private are adopting different LMSs. For instance, most of the academic staff in UOB is using Blackboard (72%) and Moodle (55%). However, RUW and AGU are adopting WebCT, Moodle and Blackboard as e-learning systems in the university.

Table 4.E-learning systems adopted by universities in Kingdom of Bahrain

LMS used for e-learning	WebCT	Moodle	Blackboard	Others LMS
AGU	2%	**11%**	8%	0%
AMA	0%	**10%**	2%	0%
AOU	3%	1%	0%	2%
AU	0%	**19%**	7%	9%
KU	0%	2%	4%	0%
BPT	0%	9%	7%	1%
RUW	4%	**20%**	6%	2%
UOB	15%	**55%**	**72%**	14%

Table 5 presents results on the drivers for adopting e-learning by the universities. The results demonstrate that, providing independent location and time for learning and ubiquity of end-user-computing are the main drivers for adopting e-learning in UOB (91% and 86% respectively). However, no common driver for adopting e-learning in the private universities can be identified from the results. As such, different drivers were identified for each university such as improving collaboration and interactivity and higher retention of content through personalization learning. Results on the technical challenges (software, hardware, network or skills) that are facing users with e-learning in the universities are presented in Table 6. It can be observed that most of the universities are facing many technical problems with their e-learning systems. In average, rapid change in the technology, inconsistency in the platforms, tools and software, and network access/usage problems are the main technical challenges faced by the universities (84%, 75% and 74% respectively).

Table 5.Drivers for adopting e-leraning

Technical challenges facing users with e-learning	UOB	AGU	AMA	AOU	AU	KU	Polytechnic	KUW	Average
Network Access/usage problems	91%	67%	92%	0%	92%	67%	83%	100%	74%
System errors and bugs	85%	67%	75%	0%	75%	83%	91%	100%	72%
Network/software crashes during classes	84%	83%	83%	0%	83%	67%	87%	86%	72%
Instructors need to be updated with the new technology	82%	75%	100%	75%	79%	67%	96%	100%	84%
Inconsistent of the platforms, tools, and software	72%	92%	92%	0%	92%	83%	100%	71%	75%
lack of technology knowledge	56%	83%	75%	0%	75%	67%	87%	71%	64%
lack of confidence to use technology in teaching	70%	83%	75%	0%	83%	67%	57%	71%	63%
lack of knowledge to design courses with technology	65%	83%	83%	25%	83%	67%	96%	71%	72%

Table 6.Tehnical challenges facing e-learning users

Driver for e-learning	UOB	AGU	AMA	AOU	AU	KU	Polytechnic	KUW	Average
Reduced cost	39%	83%	92%	100%	88%	83%	91%	71%	81%
Higher retention of content through personalized learning	48%	75%	100%	0%	100%	67%	70%	100%	70%
Improved collaboration and interactivity	73%	83%	100%	0%	92%	100%	91%	57%	75%
Borderless education	66%	67%	100%	0%	83%	83%	100%	100%	75%
Location and time independence	91%	92%	100%	0%	88%	100%	96%	100%	83%
Ubiquity of end-user computing	86%	83%	83%	0%	88%	83%	96%	57%	72%
Convenience and lifestyle	74%	83%	100%	75%	96%	100%	78%	71%	85%
It is a vehicle for community outreach	76%	75%	92%	75%	79%	100%	91%	71%	82%

Finally, Table 7 present results on the extent to what academic staffs are satisfy with the e-learning. The results reveal that although more than 60% of UOB staffs feels that the e-learning is useful and ease of use (67% and 65%), most of them are not satisfied with the e-learning.. However, private universities show a high level of satisfaction. In general, the average of users' satisfaction in all universities is low.

Table 7.E-learning user satisfaction

User satisfaction with e-learning	UOB	AGU	AMA	AOU	AU	KU	Polytechnic	KUW	Average
The overall usefulness of technology used in classes	65%	75%	75%	100%	75%	83%	74%	86%	79%
The quality of technical support provided	40%	75%	75%	75%	79%	83%	65%	57%	69%
The confidence of the stability and reliability of the online class	40%	58%	67%	75%	58%	67%	83%	71%	65%
The ease of use of technology used in class	67%	50%	58%	75%	46%	67%	96%	71%	66%
The quality of the technology used in class	28%	58%	58%	100%	54%	83%	91%	71%	68%
The necessary ICT infrastructure	33%	75%	83%	100%	83%	100%	78%	71%	78%
Quality of the internet access in the institute	42%	67%	67%	100%	67%	100%	83%	86%	76%

EMM ANALYSIS

The eMM was analyzed based on the method discussed in the methodology. For each response on each practices of each process area, a color was chosen (White=Not practiced\ not adequate Blue= partially adequate Dark Blue=largely adequate Black=fully adequate Grey=Not assessed). Based on this analysis two types of results were presented.

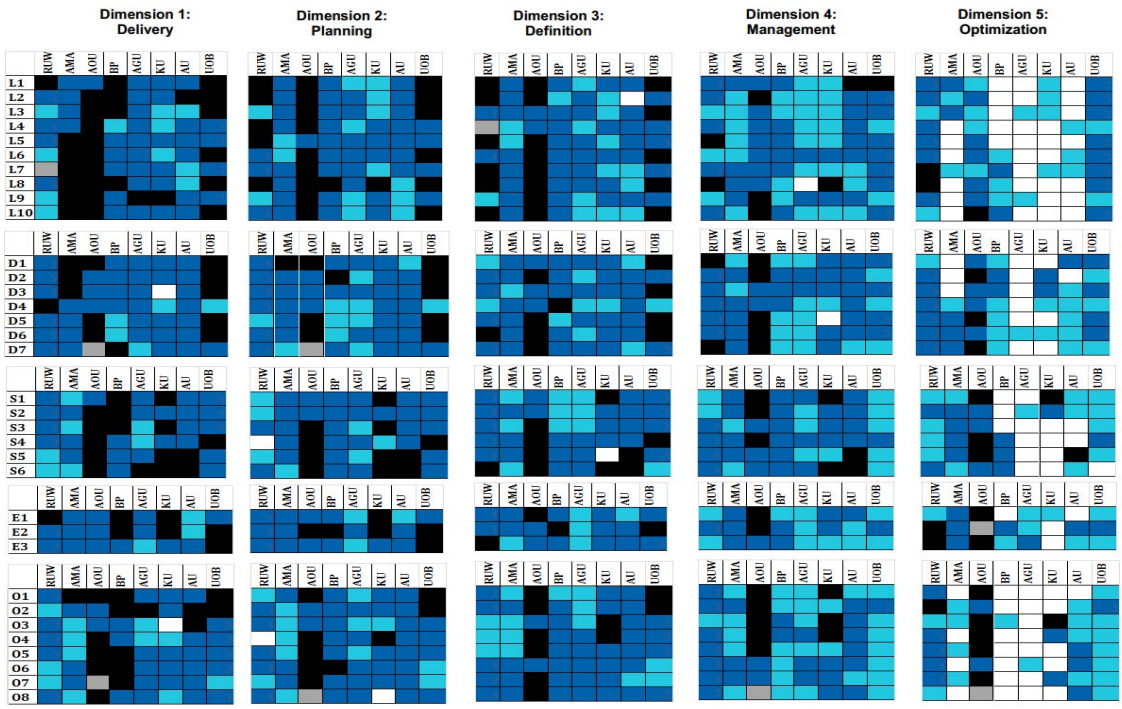


Figure 8: eMM assessment of learning process the universities in Kingdom of Bahrainin arranged by dimension

Table 8: eMM assessment of learning process the universities in Kingdom of Bahrainin arranged by universities

Universities	E-learning Learning Areas				
	Learning	Development	Support	Evaluation	Organization
UOB	D, P, DF, M,O	D, P, DF	D, P, DF	D, P, DF	D, P, DF
AOU	D, P, DF, M	D, P, DF, M, O	D, P, DF, M, O	D, P, DF, M, O	D, P, DF, M, O
RUW	P, D, M, O	D, P, M, O	D, D, M	D, P, O	D, P, DF, M, O
AU	D, P, M	D, P, DF, M	D, P, DF, M	P	D, P, DF, M
KU	D	D, P, DF, M	D, P, DF, M	D, P, DF	D, P, DF, M
AGU	D, P	D	D, P	-	D, P, DF
BP	D, P, DF	D, DF	D, P, M	D, P, DF	D, P, DF
AMA	D, P, DF	D, P	P, M, O	D, P, M, O	-

(Note: D: Delivery, P: Planning, DF, definition, M: Management, O: Organization)

The first type of results present a detail description on the performance of the universities in each process area with each maturity dimensions as shown in Figure 2. On the other hand, results on the overall view of the e-learning performance and maturity level of each university are presented in Table 8. The results illustrate how each university is performing in each learning areas and which dimension of maturity have they achieved in their e-learning. In general the results show that all universities in Kingdom of Bahrain are performing the learning, development and organization processes very well with evidence shown by fully adequate and strong capability of delivery, planning, definition, and management dimensions. However, only AOU, AU, and KU are performing well in support process with evidence shown by fully adequate and strong capability of delivery, planning, definition, and management dimensions. On the other hand, the universities are not doing well in the evaluation processes as some of them shown fully adequate and strong capability just in delivery, planning and management as shown in Figure (2) and Table (8).

DISCUSSION AND CONCLUSION

In the following section the significance of the results will be discussed and synthesized in a final conclusion. To achieve that, the results on current situation on the adoption of the e-learning were discussed and presented to

identify indications on the performance and learners' satisfaction of the e-learning. These results will be used to compare with the results on the eMM assessment of the capability maturity level to get a holistic view on the e-learning performance in the Kingdom of Bahrain.

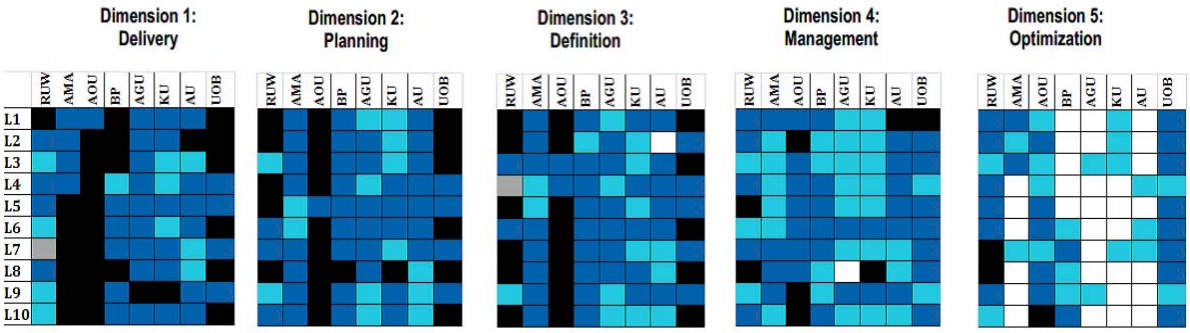
The results have identified several significant and interest findings on the current situation regarding the adoption of e-learning by the universities at Kingdom of the Bahrain. The result indicates that e-learning is essential tools for teaching in the universities. This can be revealed from the different systems that are adopted for the e-learning. The results demonstrate that most of the universities are adopting Blackboard, while the other is adopting WebCT and Moodle. Universities such as UOB, AMA, AU, KU, PB and RUW are adopting Blackboard, WebCT or Moodle, however, AOU are adopting Moodle only. In addition, some private universities are using their own system. For instance, Ahlia University is using the ADREG system and self-service system was adopted by ROW. Adopting more than one system for e-learning indicate that universities are paying high priorities for e-learning and try to encourage both students and instructors to use the e-learning by offering them different systems to satisfy their experience and knowledge. Unfortunately, the results show that the main purpose for using e-learning in most universities are uploading and downloading which considered as the basic services provided by most of the e-learning platforms. While using e-learning for the communication with instructors or students identified as minor purpose for adopting e-learning. The results can be attributed to many reasons. Students may prefer to use informal communication media like social media (WhatsApp, Facebook or Instagram) which is more ease to access and use. Moreover, monitoring students' performance is difficult in the blended learning environment. In such universities, students are assessed in the classes using the traditional assessment techniques as the available online monitoring and assessment techniques are perceived less secured.
Moreover, the results has identified a significant figures on the opinion of the academic staff on the drivers, challenges of the e-learning systems adopted in their universities as well as their satisfaction. Three main drivers for adopting e-learning were identifying which includes "convenience and lifestyle", "location and time independence", and "e-learning is a vehicle for community outreach". Regarding the challenge faced by the users of e-learning, it has been notice that most of the universities are facing challenges with their systems specially UOB, AGU and AU. The top challenges for instructors are relating to the network and technology infrastructures stability and reliability include the network Access/usage problems, system errors and bugs and network/software crashes during classes. The results indicate that academic staffs are ready in term of knowledge and skills to participate in e-learning. However, they are not provided with the robust and reliable tools and platforms. This confirmed the results that most of the respondents were agreed on that they are facing a challenge with the "Inconsistent of the platforms, tools, and software". These findings provide the decision makers and planners with some points of improvement for their e-learning system and environment. Finally, the results show that an average of 70% of the e-learning users from the different universities is satisfied with their e-learning systems. However, just 50% of the e-learning users at UOB are satisfied. This dissatisfaction rose mostly from the quality of the Internet access and technology used in classes as well as the quality of the ICT infrastructure in UOB. On the other hand, users in RUW, KU and BP showed a high satisfaction with their e-learning especially in term of the quality of technology used and Internet access. The results reflect what has been observed during distributing questionnaires, the classes were provided with advance technology like smart boards and others educational technology adopted to support the e-learning. Universities include AU, AOU and AGU have shown a moderate satisfaction regarding their e-learning systems. The aforementioned findings revealed that the e-learning in the universities in Kingdom of Bahrain are suffering from several problems. The drivers for adopting e-learning are not strategic and not aligned with the university objectives. Besides, there are many technical problems and challenges with their systems starting with e-learning infrastructure to Internet access. Furthermore, there is a degree of dissatisfaction with e-learning systems. The following findings can be used to predict the eMM level for the universities as it reflects the e-learning performance and the effectiveness of these universities.

The following paragraphs discusses the assessment of e-learning capability undertaking in the universities at Kingdom of Bahrain using the eMM (Marshall, 2007) in order to exemplify how the assessment are envisage and how this data can be used to assess the strengths and points of improvement of each university. Based on Figure (8) and Table (8) which summarizes the outcome of the assessments of learning category; the following analyses were adopted. For each learning category a detail discussion will be presented as follow:

Learning area: Learning
Delivery dimension: Some universities such as: AMA, AOU and UOB were assessed as having strong ability in the learning category showing fully adequate ability in most processes. Thus, AMA and AOU have the possibility to students to get views on their performance, providing their students with a support for the research development, as well as the possibility of students to determine timetables and delivery time. Moreover, courses in these universities are designed to support diverse learning styles and learner capabilities. UOB on the other

hand, has clear learning objectives and providing their students with mechanisms for interaction with instructors. RUW, KU, AGU and AU are not performing the learning process well (largely to partially adequate rating for delivery dimension) with no assessment on the learning designs and activities actively to engage students.

Universities	UOB	AOU	RUW	AU	KU	AGU	BP	AMA
Learning	D, P, DF, M,O	D, P, DF, M	P, D, M, O	D, P, M	D	D, P	D, P, DF	D, P, DF



Planning dimension: AMA, AOU and UOB are mostly performing the learning process very well with evidence shown by the fully adequate rating of the planning dimension. The objectives of the learning have the ability to guide the design and the implementation of the courses. In addition, the students are provided with mechanisms in order to interact with colleagues or with the academic stuff. BP is performing all planning processes well (largely adequate rating) except L8 that performing this process very well (fully adequate rating). AGU, KU and AU are not performing the learning process well with evidence shown of the partially adequate of the planning dimension.

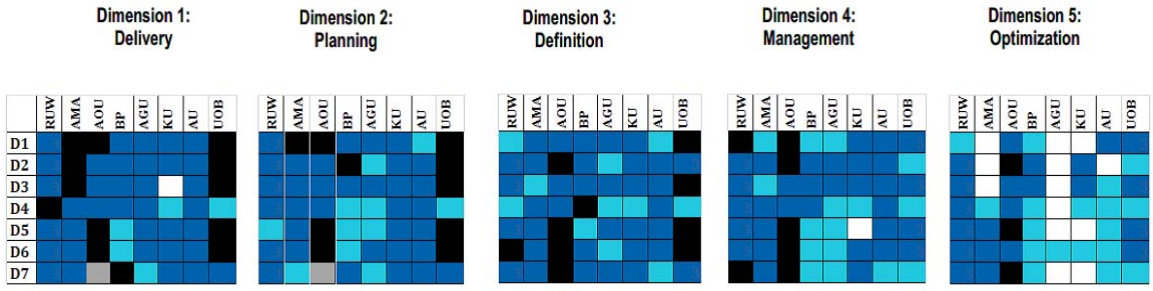
Definition dimension: RUW, AOU and to some extent UOB are performing the learning process very well than other universities (largely to fully adequate rating of the definition dimension). RUW perform less in providing the students with expected staff response time. AMA and PB and AGU are mostly performing the learning process well with evidence shown by the largely adequate of the definition dimension.

Management dimension: AOU, BP, AU and UOB are performing the learning process well with evidence shown by the largely adequate of the management dimension. AMA, KU and AGU universities are significantly less capable in learning process with evidences shown by the partially adequate of the management dimension, with the absence of design assessment to build student qualification and competences (L8) in AGU.

Optimization dimension: RUW and to some extent UOB are more able in the learning process in optimization dimension than other universities with evidence shown by the partially adequate rating of the optimization dimension. AMA, AGU, KU, BP and AU are showed absence in most learning process of the optimization dimension.

Learning area: Development
Delivery dimension: RUW showed fully adequate only in (D4) in which courses are designed to support disabled students. AMA, AOU and UOB are mostly perform development process with evident shown fully adequate for AMA in (D1 to D3), AOU in (D1), (D5) and (D6) and UOB in (D1), (D2), (D3) and (D5), (D6). UOB IS performing the development, creation and maintenance of e-learning resources very well. That is reflecting high level of development and maintenance of e-learning resources. Nevertheless, BP, AGU and KU and AU universities are shown largely adequate in most of the development process.

Universities	UOB	AOU	RUW	AU	KU	AGU	BP	AMA
Development	D, P, DF	D, P, DF, M, O	D, P, M, O	D, P, DF, M	D, P, DF, M	D	D, DF	D, P



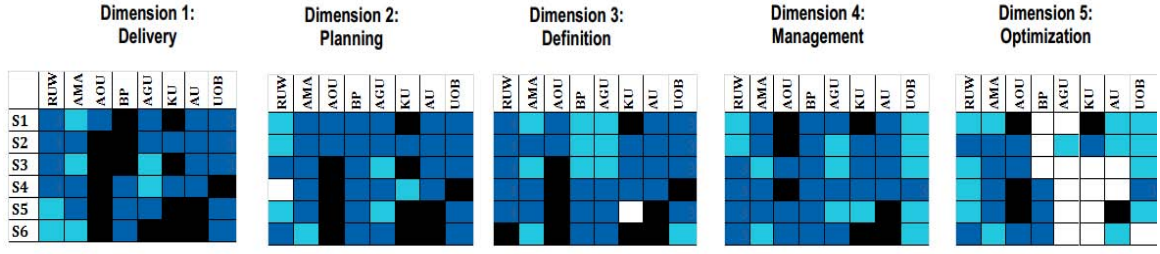
Planning dimension: UOB are mostly performing the development process well with evidence shown by the fully adequate of the planning dimension except in designing courses to support the disable students and the management of e-learning resources to maximize reuse. RUW, AMA, KU, and AU universities are performing the development process very well (partially to largely adequate rating of planning dimension). AOU on the other hand, showed fully adequate in providing reliable, robust, and integrate e-learning infrastructure in addition to support the teaching staff engage in e-learning. However, BP and AGU universities are mostly not performing the development process well with evidence shown by the partially adequate of some of planning dimension.
Definition dimension: the results show that AOU and UOB universities are the most universities performed well in in this dimension. As such AOU shown fully adequate in (D3), (D4), (D5) and (D6) while UOB shown fully adequate in (D2), (D5), (D6) and (D7). Both universities are significantly doing well in providing a reliable, robust and integrated infrastructure. Other universities such as MA, BP, AGU, KU and AU are performing the definition process well with evidences shown by the largely adequate in most of the variables in development dimension.

Management dimension: RUW and AOU are performing development process well as evidences shown by largely to fully adequate in management level. Other universities such as AMA, KU, AU, and UOB are performing the development process to certain extent as evidences shown by the partially to largely adequate of the management dimension. However, BP and AGU are not performing the development well with evidence shown by partially adequate in most processes of the management dimension.

Optimization dimension: AOU and RUW are the only universities that are mostly performing the development process very well with evidence shown by the fully and largely adequate rating of the development dimension. Other universities include AMA, BP, KU, AU, UOB, and especially AGU showed absence in performing the development process with evidences showed not adequate to partially rating for optimization.

Learning area: support
Delivery dimension: AOU and KU are mostly performing the support process very well with evidence shown by the fully adequate rating of the delivery dimension. RUW, AU and UOB are mostly performing the support process well with evidence shown by the largely adequate of the delivery dimension. AMA university was assessed as having largely to partially adequate capability in the support category in most processes, while BP University was assessed as having largely to fully adequate capability in the learning category in most processes. AGU is performing very well the support process with evidence of fully adequate rating for the delivery dimension as the teaching staff are provided with technical supports and performing the support process well (partially to largely adequate rating of the rest delivery dimension processes).

Universities	UOB	AOU	RUW	AU	KU	AGU	BP	AMA
Support	D, P, DF	D, P, DF, M, O	D, D, M	D, P, DF, M	D, P, DF, M	D, P	D, P, M	P, M, O



Planning dimension: AOU, KU and to some extent AU are mostly performing the support process very well with evidence shown by the fully adequate rating of the planning dimension. PB, AMA and UOB are performing the support process well with evidence shown by the largely adequate of the planning dimension. KUW and AGU were assessed as having partially to largely adequate ability in the support category in most processes with the observation that KUW is showed absence in providing the students with learning supports services (S4).

Definition dimension: KU, AOU and AU are mostly performing the support process very well with evidence shown by largely to fully adequate rating of the definition dimension. However, KU University is suffering from the absence of providing the academic stuff with E-learning pedagogical support (S5). RUW and UOB are performing the support process well with evidence shown by the largely adequate of the definition dimension. AMA, BP and AGU are not performing the support process well (partially to largely adequate rating of the definition dimension processes).

Management dimension: AU, AOU and KU are performing the support process very well than other universities for the management dimension. PB is performing all the support process well with evidence shown by the largely adequate of the management dimension. AGU and RUW was assessed as having partially to largely adequate capability in the support category in most processes, while the UOB is not performing the support process well (partially adequate rating for management dimension).

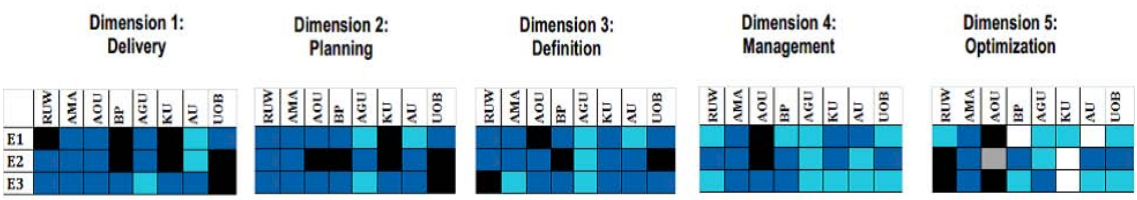
Optimization dimension: AOU and AMA are more able in support process in this dimension (optimization) than other universities with evidence shown by fully to largely adequate rating for AOU and partially to largely adequate rating for AMA thus the support process is mostly performed well. RUW and UOB are not performing the support process well (largely to largely adequate rating of the optimization dimension processes), as the (UOB) does not providing the academic stuff with technical supports while using the digital information. BP universities are significantly less able in the support process with evidence shown by the partially adequate rating for (S4, S5 and S6) and absence in the other optimization dimension processes. KU and AGU shows absence in the support process (not adequate rating for the optimization dimension) in most support processes.

Learning area: evaluation

Delivery dimension: AOU, KU and UOB are mostly performing the support process very well with evidence shown by the fully adequate rating of the delivery dimension. RUW, AMA and AOU are mostly performing the support process well with evidence shown by the largely adequate of the delivery dimension. In AMA university was assessed as having largely to partially adequate capability in the evaluation category in most processes, while BP University was assessed as having largely to fully adequate capability in the learning category in most processes. AGU is performing very well the support process with evidence of fully adequate rating for the delivery dimension as the teaching staff are provided with technical supports and performing the support process well (partially to largely adequate rating of the rest delivery dimension processes).

Planning dimension: UOB, KU, AOU and BP are mostly performing the evaluation process very well with evidence shown by the largely to fully adequate rating of the planning dimension. AMA and RUW are performing the evaluation process well with evidence shown by the largely adequate of the planning dimension. AU and AGU were assessed as having partially to largely adequate ability in the evaluation category in most processes with the observation that AGU is showed absence in providing the students with learning supports services (E1 and E3).

Universities	UOB	AOU	RUW	AU	KU	AGU	BP	AMA
Evaluation	D, P, DF	D, P, DF, M, O	D, P, O	P	D, P, DF	-	D, P, DF	D, P, M, O



Definition dimension: RUW, AOU, BP, UOB and KU are mostly performing the evaluation process very well with evidence shown by the Largely to fully adequate rating of the definition dimension except KU with evidence shown all largely rating in all definition process. AU and AMA universities are not performing the

support process well (partially to largely adequate rating of the definition dimension processes). AGU on the other hand is not performing evaluation process well (partially adequate rating of the definition dimension processes).

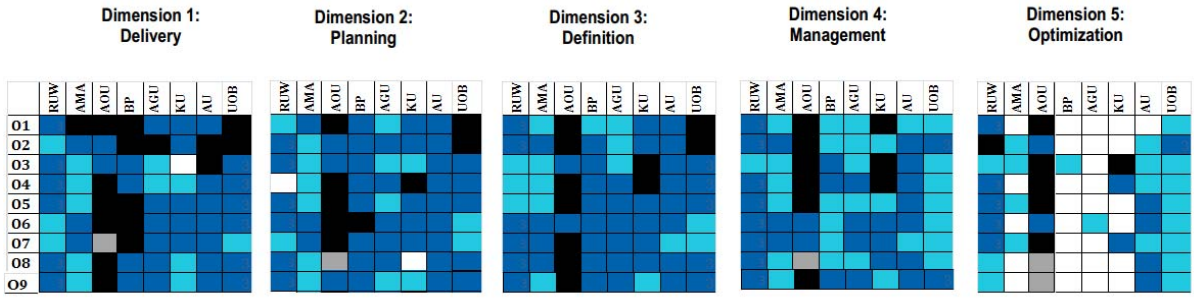
Management dimension: among the participated universities, only AU, and AMA are performing the evaluation process very for the management dimension with evidences shown by largely to fully adequate rating in AU and all largely rating in AMA for management dimension. Other universities were assessed as having partially to largely adequate capability in the evaluation category in most processes, while the AGU is not performing the evaluation process well (partially adequate rating for management dimension).

Optimization dimension: RUW, AOU and AMA are more capable in this learning process the dimension of optimization than other universities with evidences shown by largely to fully adequate for RUW and AOU and all largely adequate in AMA. However, in AOU the ability of the teaching staff to provide feedback on quality and effectiveness of their learning experience was not assessed. AGU and UOB not performing the evaluation process well (partially to largely adequate rating of the optimization dimension). However, BP and AU and BP universities are significantly less able in the evaluation process with evidence shown by the partially adequate rating in many of the process. In addition, BP and AU show an absence in E1 (students are not able to provide feedback on the quality and effectiveness of their e-learning experience). However, in KU evidences shown an absence of assessments for E2 and E3.

Learning area: Optimization
Delivery dimension: AOU and BP are mostly performing in organization process with evidence shown largely to fully adequate in the delivery dimension. However, process O7 is not assessed in AOU. AGU, AU and UOB have less perform organizing process with evident shown largely adequate of the organization processes. RUW, AMA, and KU move from largely to partially in most organization process. However, the results shown that there is not explicit plan to guide e-learning technology decisions (O3) in KU.

Planning dimension: AOU, UOB and BP are mostly perform in development process with evidence shown largely adequate to fully adequate. As such it is fully adequate for AOU in (O1), (O4) to (O9), UOB only in O1 and O2 while in BP just in O6. AU on the other hand is performing very well with evidence shown all largely adequate in all organization process for the planning dimension. RUW, AMA, and KU have less preformed with evidence shown partially to largely adequate, with absent of processes O4 in RUW and O8 in AMA.

Universities	UOB	AOU	RUW	AU	KU	AGU	BP	AMA
Optimization	D, P, DF	D, P, DF, M, O	D, P, DF, M, O	D, P, DF, M	D, P, DF, M	D, P, DF	D, P, DF	-



Definition dimension: AOU is performing very well in the organization process with evidence show mostly fully adequate in the definition dimension. KU and UOB have just two process which shown fully adequate with the rest are ranging between partially and largely adequate. BP, AU, AGU, AMA and RUW have performed less in the organization process with results shown partially to largely adequate in most processes with AMA getting mostly partially in the organization processes for the definition dimension.

Management dimension: AOU, KU, RUW and AU are performing well in the organization process comparing with the other universities. The evidence have shown that these university perform mostly largely to fully adequate in most of the processes. However, other university such as AMA, BP, AGU, and UOB are performing less in the organization process as the results shown that most of them are partially adequate in most of the processes which lead to less management in organization process.

Optimization dimension: AOU and RUW are the only universities that are performing well in this process with evidence show largely to fully adequate. However, process O8 and O9 are not assessed in AOU. AU and UOB are performing significantly less in the organization process with evidence shown partially adequate in most process in the optimization dimension. On the other hand, AMA, BP, AGU and KU have revealed absent in performing the organization process with evidence show not adequate in most process.

As a conclusion on the above discussion, it can be noticed that the overall eMM figures demonstrate that universities in Kingdom of Bahrain have reached an average level of achievement and performance in the e-learning processes and developed reasonable capability maturity on each dimension of the learning processes. As such the results revealed that AOU has the highest capability maturity level among the universities with evidence shown fully adequate in most of their learning processes. It can be noticed that in AOU the capability in the higher dimensions (evaluation and Optimization) are supported by capability at the lower dimensions (delivery, planning and definition). So they are sustainable and responsive to institutional and learner needs as well as are capable to deliver the desired outcome. However, UOB – the only public university- are not fully performed in most of their learning process. UOB is performed very well only in the learning area with evidences shown a full adequate in all dimensions of this process. However, in the other learning areas such as development, support, evaluation and organization, they are providing an ad hoc, unsustainable and unresponsive capability to the learner needs as their capabilities at lower dimensions are not supported by that at the higher dimensions. Other private universities such as AGU, BP and AMA are performing less in most of the learning areas with lower capability maturity level. In most of the dimensions of the learning areas, these universities are not well established and adequate. For instant, KU is not performing the learning process, while AU is not performing the evaluation process. Finally, AGU, BP, and AM, have the lowest e-learning maturity level as they are not performing well in most of the learning categories.

In general, the current maturity level of e-learning in Kingdom of Bahrain shown to be gone through definition stage to management stage in addition to some characteristics of optimization in few universities. Public universities such as UOB and most of the private universities have done noticeable efforts toward developing more reliable and effective e-learning systems and more sustainable e-learning services and environment. Universities at Kingdom of Bahrain are well performing the learning processes that are mostly related to the pedagogical aspects of e-learning, to that surrounding the creation and maintenance of e-learning resources and ending to that associated with institutional planning and management. In each of these learning areas, some universities already have exceeded the ad-hoc process to more advanced and well defined process for development and support of e-learning. Moreover, AOU, have reached a level in which it providing a continual improvement in all aspects of the e-learning processes. Nevertheless, UOB, AGU, BP, and AMA have problems with the consistency between the lower and higher dimensions of the learning areas. In general, they are paying less attention to the importance of the feedback on the quality and effectiveness of their learning experience and the regular review of the e-learning different aspects of students and teaching staff. Moreover, e-learning initiatives in such universities are not guided by the institutional strategies and operational plans as well as the institutional policies and strategies of learning and teaching are not address in the e-learning. Thus, e-learning are misaligned with the overall institutional strategies, goals and objectives. This result is aligned with the current situation of the adopted e-learning in theses universities. The drivers for adopting e-learning are not to achieve the institute goal or productivity and the infrastructure is not well established and suffers from a major technical problems which in turn, results in a high level of dissatisfaction among the users of e-learning. Investing in e-learning as any IT projects needs to be evaluated and assessed periodically and benchmark with model or standards. The benchmarking will helps in understanding the institution's strengths and points of improvement of the different learning processes; starting from that directly impact the pedagogical aspects of e-learning to that associated with the institutional planning and management. In addition, it can be considered as a road map for e-learning planners and educational institutions to improve their e-learning capability maturity level and performance by fill up the missing point toward more accountable progress.

REFERENCES

AlAmmary, J (2012). "Educational Technology: A way to enhance student achievement at the University of Bahrain", in proceeding of International Conference on New Horizons in Education Inte2012 Social and Behavioral Sciences , 55, 248 – 257.

Al-Musawi, N. (2014), "Development and Validation of a Scale to Measure Student Attitudes Towards E-learning", Journal of Teaching and Teacher Education, 2(1), 1-12.

Griffiths, A. (2005), "Capability model mature–or is it?, IT Now", Oxford Journals, http://itnow.oxfordjournals.org/cgi/content/abstract/47/5/18 last accessed 11.5.2006

Iskander, G. and Daflous, G. (2013), "Exploration of Qualitative Evidence: Towards Construction of Maturity

Model for E-learning", in proceeding of the 2nd e-learning Regional Conference, Kuwait.
Jabli, N. and Qahmash, A. (2013), "The Benefits and Barriers of E-learning in Higher Education in Saudi Arabia", Journal of Emerging Trends in Computing and Information Sciences, 4(1), 877-880.
Jacobson, M. and Wilensky, U. (2006), "Complex systems in education: scientific and educational importance and implications for learning services", the Journal of Learning Science, 15(1), 11-34
Marshal, S. (2010) "A quality framework for continuous improvement of e-learning: The e-learning Maturity Model", Journal Distance Education, 24(1), 143-168
Marshall, S. and Mitchell, G. (2002), "An e-learning maturity model?", Proceedings of ASCILITE 2002, Auckland, New Zealand.
Marshall, S. and Mitchell, G. (2002),"e-Learning: The e-Learning Maturity Model", Journal Of Distance Education, 24(1), 143-166.
Marshall, S. and Mitchell, G. (2004), "Applying SPICE to e-Learning: An e-Learning Maturity Model?", Sixth Australasian Computing Education Conference, Australia, 2004.
Mirza, A. and Al-Abdulkareem, M. (2011), "models of e-learning in the middle east" Applied computing and Informatics, 9(1), 83-93.
Mohammed.S. (2010), "SWOT Analysis of E-learning system in Bahraini universities", in proceeding of International conference on e-Education, e-Business, e-Management and e-learning, IEEE Computer society, Bahrain.
Nagarajan, P. and Jiji, W. (2010), "Online Educational System (e- learning)", International Journal of u- and e-Service, Science and Technology, 3(4), 37-48.
Penicina, L (2011), "Towards E-Learning Capability Maturity Model", Scientific Journal of Riga Technical University, 43, 88-91.
Petch, J. and Calverley, G. and Dexter, H. and Cappelli, T. (2007), "Piloting a Process Maturity Model as an e-Learning Benchmarking Method", The Electronic Journal of e-Learning, 5(1), 49 – 58.
Phillips, V. (2002), "Why does corporate e-learning fail? Virtual University Gazette, June
Rafique, M. (2011), Bahrain successfully implement e-learning, [online] . Available in: http://www.twentyfoursevennews.com/bahrain-news/bahrain-successfully-implements-e-learning/, last access 2/12/2014.
SEI (2004), Process Maturity Profile: Software CMM 2004 Mid-Year Update, Software Engineering Institute, Carnegie Mellon University, Pittsburgh, USA. http://www.sei.cmu.edu/sema/pdf/SWCMM/2004aug.pdf.
Shaker, H. Rashed (2000), "Distance Education in Bahrain: Situation and needs", Open Learning: The Journal of Open, Distance and e-Learning, 15(1), 57-70.
[20] Paulk, M., Curtis, B., Chrissis, M. and Weber, C. (1993), "Capability Maturity Model for Software", Version 1.1, Technical Report, Software Engineering Institute.
[21] Kaur, J. (2014), "Comparative Study of Capability Maturity Model", International Journal of Advanced Research in Computer Science & Technology, 2(1), 47-49.
[22] Petch J. , Calverley G. , Dexter H. , and Cappelli T. , (2006), "Piloting a Process Maturity Model as an e-Learning Benchmarking Method," In Proceedings of the 5th European Conference on e-Learning (ECEL2006). Academic Conferences Limited.
[23] Zhou, Y. (2012), "Towards Capability Maturity Model of e-Learning Process", Intelligent Information Management, 4, 95-98.
[24] Kwak, Y. and Ibbs, C. (2002), "Project Management Process Maturity .PM.2 Model", Journal of Management in Engineering, 18(3), 150-155.
[25] Reitzig, R. and Miller, J. and West, D. and Kile, R. (2003), "Achieving Capability Maturity Model Integration (CMMI) Maturity Level 2 Using IBM Rational Software's", Solutions, Rational Software Corporation.
[26] Grottke, M. (2001), Software Reliability Model Study, Deliverable A.2 of project PETS (Prediction of software Error rates based on Test and Software maturity results), IST-1999-55017, 2001

Evaluation of Fatih Project in the Frame of Digital Divide

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ABSTRACT
The aim of this research realized at the general survey model is to evaluate "FATIH Project" in the frame of digital divide by determining the effects of the distributed tablets to the students being educated at K12 schools on digital divide. Sample is taking from the 9th grade students in Sakarya city in the 2013-2014 academic session. The sample is determined according to purposive sampling method, and is formed of 301 students of two Anatolian High Schools and one Anatolian Teacher High School. They made use of tablet computers, whose opportunities scale they have benefited from (these have been developed by researcher as data collection instrument). After the data which was collected by the researchers has been classified; they were transferred to SPSS 17.00 in PC. The frequency distribution of the data was taken and t-test statistical procedure for matching groups was realized to compare the averages before and after the tablets have been distributed. According to the findings, it was established that FATIH Project increased the students' level of ICT, and the usage and benefit from the opportunities that it present. It has also been established that FATIH Project has an important place in preventing digital divide.

Keywords: FATIH Project, Tablet Computer, Digital Divide.

INTRODUCTION

Rapid developments in information and communication technologies (ICTs) realized a change in economical and social life (Kotkin, 2000). This change presented the need for the individuals who knew the way of reaching knowledge and also knew the way of reaching information rapidly, to question the knowledge they have, and to use the technology in an effective way (Seferoglu and Akbiyik 2007). The societies with individuals having these features are named as developed countries which have strong economy.

The difference between the developed and developing countries on ICT increases (Ege, 2008), so, inequalities in ICT access and usage are being lived at different dimensions in the boundaries of a country (Ozturk, 2005), in a residential area (Yilmaz & Ersoy, 2012; Gudmundsdottir, 2010; Nicholas, 2003) even in different provinces of a city (Yilmaz and Ersoy, 2012).

Inequalities being experienced in ICT access and usage are stated as digital divide (Wei, Teo, Chan & Tan, 2011; Hohlfeld, Ritzhaupt, Barron & Kemker, 2008; Tien & Fu, 2008; Seferoglu, Avci and Kalayci, 2008, Aytun 2005; Norris, 2001; Ozcivelek et al, 2000). Digital divide is being defined as the "differences between individuals, household, institutions and different geographical regions at different socio-economic levels in the frame of access to ICT and internet usage opportunities" by OECD (2001). Campaine (2001) defines digital divide as the difference between the ones having the newest information technologies and the ones who do not have, Hargittai (2003) as the ones reaching digital technologies or not or the ones being able to use digital technologies or the ones who cannot, Salinas (2003) as inequalities between the ones who are able to use ICT and the ones who are not.

The internet in recent time has become of great importance in rapid information dissemination. Internet is seen as a miracle communication device which will provide an elimination of the inequality between people of the world and democratizing of public area of the world (Cheviron, 2006). DiMaggio, Hargitta, Neuman and Robinson (2001) state that it is required for us to be interested not only with inequalities at internet access but also with inequalities based on factors such as equipment, software and content of the connection, skill of using technology and the ones who are able to access internet. Onur (2007) does not think that it will be possible to decrease digital divide although some imbalances are eliminated by adding technology/computer literacy to the inequalities in the distribution of the technologies in the countries in case of not solving this issue. In short, skills of using information technologies in order to be successful and to access information by using these instruments in a knowledge based society is mostly important (Servon and Nelson, 2001). Because of this reason, it is

important for us to remove the inequalities in ICT access and usage (Gunduz, 2010). While the internet plays an important role in education (Iske, Klein and Kutscher, 2005), this subject gains a great importance in recent times, while the effects of ICT access and usage in the frame of digital divide have been questioned as education gains more importance.

Tablet computers in the latest ICTs are also accepted as individualistic computers. Although a tablet which has been developed by Elisha Gray in 1888 has been accepted as the Pioneer of first modern tablet, the entrance of reel tablets of nowadays in our lives has been realized in 1964. "Dynabook" has been produced which has been accepted as a portable computer for the children by Xerox Palo Alto Research Center and Alan Kay in 1972. Apple introduced to the market a tablet named: "Apple Graphics Tablet" which transfers the drawings made to the computer in 1979. Many tablets have been developed which have different operating systems since 1964, by Apple's producing iPad in 2010, tablets produced by many firms became usable in recent times.

As the educational system cannot remain unresponsive to the developments in a period when ICT has been too effective (Pamuk, Cakir, Ergun, Yilmaz and Ayas, 2013), the importance of ICT has been understood in education in a short time as it has been in economical and social areas . Because of this reason, some countries projects started to be developed with the aim of using information and communication technologies, easy access to knowledge and opportunity for equality to make their students active and equipped in tomorrow's changing world. Laptops and tablets were given to the students in the content of the projects. The first of these projects started firstly in Maine State in the United States of America in 2002. After Maine, laptops were given to the students in North Carolina in 2003, in New Hampshire, in Kentucky in 2004 and in Louisiana in 2007 (Pamuk and others, 2013) respectively.

The projects in which laptops and tablets have been given to the students in Portugal, Thailand, South Korea, Scotland, Singapore and France in addition to United States of America have been put into practice in the last ten years. It has been observed that as there are no adequate staff to make these tablets work efficiently and as there are no enough substructures, they could not be used effectively (Hongladarom, 2006). For this reason, technical support has been provided for the schools to carry out these projects in a successful way in United States of America (Barrios at al, 2004). In Turkey, FATIH project (Movement of Enhancing Opportunities and Improving Technology) which has been developed by Ministry of National Education has started to be applied since 2012.

FATIH (MOVEMENT OF ENHANCING OPPORTUNITIES AND IMPROVING TECHNOLOGY) PROJECT

FATIH Project with the aim of realizing IT supported education and providing information technologies to the classrooms at K12 schools by Ministry of Education in Turkey started in 17 cities and 52 schools from 2011-2012 academic session. FATIH Project is a project developed for the active usage of information technology instruments in courses in order to address more sensual organs in learning-teaching process with the aim of providing opportunity, equality and improved technology at schools. FATIH Project is composed of five main components (MEB, 2011):

1. Providing Equipment and Software Substructure
2. Providing Educational e-content and Management of e-content
3. Effective Usage of the ICT in Teaching Programs
4. In-service Training of the Teachers
5. Conscious, Reliable, Manageable and Measurable ICT Usage.

It is aimed at providing LCD panel interactive boards and internet substructure of 570.000 classrooms at K12 schools in Turkey, giving tablet computers to every teacher and student, giving in-service education to teachers and establishing e-content educational programs in the frame of these components. It can be told that the government's financial policies changed to prevent digital gap and to provide equal opportunity in Turkey (Yildiz and Seferoglu, 2013). When the distribution of the investments on information and communication technologies in public has been examined, there were investments in the Ministry of National Education and universities as 46% in 2012, 45% in 2013, 44% in 2014. Education took the first place in investments. 803 million Turkish Liras (TL) in 2012, 1.4 billion TL in 2013 and 1.4 billion TL in 2014 have been separated from the general budget for FATIH Project. FATIH Project takes the first place as investment in the last three years. In the next years, it is stated that the share to be given in ICT from the general budget will increase (KB, 2012; KB, 2013; KB, 2014).

It can be said that there is not enough study on digital divide at k12 schools in Turkey (Yildiz and Seferoglu, 2014a). Yildiz and Seferoglu (2013) reached a conclusion that firstly, the students should be ICT literate to use

the tablets distributed in FATIH Project effectively and in the research in which they presented the role of education and information technology teachers in preventing numerical gap. In addition to this, they are determined that effective, conscious technology usage should be supported by computer technology teachers to prevent the damages born out of intensive and false technology usage by students. Also, they stated that in-service education should be given to the teachers in order to increase their research. Yildiz and Seferoglu (2014) determined that two third of the participants did not have ICT access, ICT access of females have been lower than those of the males, the lowest ICT literate has been in South East Region of Turkey, the highest ratio has been in Mediterranean Region according to socio-economic and cultural background features of the students in their second study in which they examined numerical gap levels of elementary school students according to different variables.

Yilmaz and Ersoy (2012) examined digital divide in the frame of several variables between fifth grade students in Diyarbakir city. They determined to see that there would be differences even between central provinces on ICT access and usage situations. Also, they reached the result that the elementary school students used ICT mostly with the aim of education. Gunduz (2010) examined digital divide at elementary schools in Turkey. Gunduz determined that few families with low socio-economic level had computers at their homes, the ones whose socio-economic level was high also had computers at their homes. He reached the same result about internet access at daytime. Gunduz and Hamedoglu (2003) also reached the same results they made on high school students. Asici and Usluel (2013) examined the numerical gap according to demographic features of university students and determined that female students used ICT more with the aim of academic studies than male students. Pamuk at al. (2013) reached the result stating that limitations at tablet and internet usage and not giving enough technical support created several problems in their study in which they evaluated FATIH Project with teacher and student point of view. Also, Gulpinar, Kuzu, Dursun, Kurt and Gultekin (2013) evaluated FATIH Project with the point of view of parents and were determined that the parents assessed the project positively and supported it but they had critics on timing.

Three indicators on digital divide are claimed as (1) access, (2) usage and (3) ICT literate (Yildiz and Seferoglu, 2013; Hohlfed, Ritzhaupt, Baron, Kemker, 2008; Tein and Fu, 2008; Geray, 2003; OECD, 2001). (1) access as the individuals' access to software, equipment, internet and technology support (Hohlfed, Ritzhaupt, Baron, Kemker, 2008); (2) usage as individuals' having ICT knowledge and skills (Solomon, Allen and Resta, 2003); (3), ICT literate as individuals' skills of looking for, processing, selecting information and skill of knowing which resource to apply (Van Dijk and Hacker, 2003) means in a large perspective. Three indicators which have been accepted by the authorities are taken as "access=level of owning", "Usage=usage level", "ICT literate= level of benefiting from the opportunities of ICT' presents".

THE AIM OF THE STUDY

The aim of this paper is to evaluate FATIH Project in the frame of digital divide by presenting the effects of tablet computers distributed in the content of FATIH Project by Turkish Ministry of Education on digital divide. Answers to sub-problems below will be looked into in order to reach this aim:

1. What are the ICTs which the students have?
2. After the tablet computers had been given to the students by the government, did the level of using tablet computers by the students show a change?
3. After the tablet computers has been given to the students by the government, did the level of benefit from the opportunities which the tablet computer present shows a change?

LIMITATIONS

This study is limited to the students of high schools in Sakarya city of Turkey in the 2013-2014 academic session. Also, the research is limited to the use of tablet computers and the internet from all ICTs.

METHODOLOGY

1. MODEL, POPULATION AND SAMPLE OF THE STUDY

The research has been realized in general survey model taking place in survey models. The sample is taken from the 9th grade of high school students in Sakarya city in the 2013-2014 academic session. The sample of the research has been determined according to purposive sampling method. According to this sampling method, three high schools which were- two Anatolians and one Anatolian Teacher High School in which tablet computers were given to the students in the content of FATIH Project in Sakarya city in 2013-2014 academic session have been included. The students in four classrooms of (A, B, C, D) of the 9th grade have been taken as sample at each of those school. And an average of 30 students have been taken from each classroom, making it a total of 120 students from the first Anatolian High School, 120 students from the second Anatolian High School and 120 students from the Anatolian Teacher High School, amounting to a total of 360 students in all.

2. DATA COLLECTION INSTRUMENTS

"Using and benefiting from tablet computers scale" which is developed by the researcher as data collection instrument was used. 24 questions which have been prepared according to five Likert related to determining the level of using and benefiting from tablet computers took place in the scale. The scoring of answers taking place in the scale is as" never=1" point, "Rarely=2" points, "partially=3" points, "Largely=4" points, "Completely=5" points. "1.00-1.79" for never, "1.80-2.59" for rarely, "2.60-3.39" for particularly, "3.40-4.19" for largely and "4.20-5.00" for completely. Score gaps were taken into account while determining arithmetical averages of these scores. At the result of reliability study realized for "24" questions, "Cronbach's Alpha" value was determined as "0.975".

Table 1. Kaiser-Mayer Olkin (KMO) Sampling measurement and Barlett's Test results of the Scale

KMO Sampling measurement competence value	0,964
Barlett Test Approximate Ki-Square value	17642,267 sd=276, p=0,000

As seen in Table 1, at the result of the validity test study, sampling measurement competence value (KMO) of the questionnaire has been determined as "0.964". As this value has been above "0.70", it is accepted that sampling number is sufficient. Also, Barlett's Test result has been given as "p=0.00<0.05". This shows that there is a meaningful difference between sample number and item number in the scale. The scale explains 72.159% of the feature which the researcher wants to measure. It has been determined that the load values of every item in the scale have been in "0.642-0.855" gap. The scale has been formed from two scales. The first factor is "Level of using tablet", the second factor is the "Level of benefiting from the opportunities which the tablets present". Also, questions related to demographical features of the individuals and their situations of having ICT at the beginning of the scale.

3. COLLECTION OF THE DATA

After the legal permissions have been taken, the scales were distributed before the tablet computers in the content of the FATIH project were distributed. Then, required explanations made for the school headmasters and ICT teachers at the schools taking place in the sample. The students filled in these scales which could be accepted as pretest before taking the tablet computers. Therefore, data related to having ICT skills, using tablet computers and level of benefiting from the opportunities the tablets present have been taken from the students before the tablets were delivered to them. Later, the Ministry of National education waited for the distribution of the tablets in the content of the project. After tablets have been given to three schools, the scale was applied to the classrooms again in the last month of the 2013-2014 academic sessions. In other words, the same scales were applied to the students before and after the tablets have been distributed.

4. DATA ANALYSIS

The scales were examined one after the other after they have been collected and classified, and it was established that a total of 325 scales returned back when the scales collected before the tablet computers have been examined, and a total of 330 scales returned back when the scales collected after the tablet computers have been examined. When the scales have been examined in detail, some of them were out of content and data taken from a total of 301 scales were transferred to SPSS 17.00 computer program. Firstly, the frequency distribution of demographical features of the students and their ICT situation has been calculated. Paired-Samples T test was used with the aim of determining whether there is any change before and after the distribution of tablet computers. This procedure has been realized separately for "using tablet computers" and "benefiting from the opportunities the tablet computer presents" with every scale item. "p<0.05" condition is looked for to determine whether there is a meaningful difference between the averages.

FINDINGS

Findings according to the statistical procedures realized from the data taken from 301 9th grade students that are being educated at 3 different schools in the sample took place in this section. Firstly, demographical features of the students taking place in the sample are seen in Table 2.

Table 2. Demographical features of sample

Variables		N	%	Variables		N	%
Gender	Female	178	59,1	School type	Anatolian High School	204	67,8
	Male	121	40,2		Anatolian Teacher High School	97	32,2
	Missing	2	,7		Missing	0	0,00

Father's educational level	Total	301	100,0	Mother's educational level	Total	301	100,0
	Elementary school	45	15,0		Elementary school	114	37,9
	High school	148	49,2		High school	137	45,5
	University	105	34,9		University	43	14,3
	Missing	3	1,0		Missing	7	2,3
Student's average grade	Total	301	100,0	Income level of the family	Total	301	100,0
	Lower than 70	41	13,6		Lower than 1000 TL	19	6,3
	Between 70-85	137	45,5		Between 1000-3000 TL	164	54,5
	Above 85	45	15,0		Between 3000-5000 TL.	73	24,3
	Missing	78	25,9		More than 5000 TL	30	10,0
	Total	301	100,0		Missing	15	5,0
					Total	301	100,0

When Table 2 is examined, it would be observed that 2 (0.7%) students from 301 students did not state their gender, 179 (59.1%) of the students are female, 121 (40.2%) of the students are male from the ones who stated their gender. 97 (32.2%) of the students are at Anatolian Teacher High School, 204 (67.8%) of them are at Anatolian High School. Grade point average of 41 (13,6%) students are below 70, 137 of them (45.5%) are between 70-85, 45 (15.0%) of them have grade point average above 85. 78(25.9%) of the students did not give information about their grade point average. Fathers of 45 (15.0%) students are graduated from elementary school, 148 (49.2%) of them from high school and 105 (34.9%) of them from university. While mothers' educational level has been examined, 114 (%37.9) of them are graduated from elementary school, 137(54.5%) of them from high school and 43 (14.3%) of them from university. 3 (1.0%) of the students did not give information about their father's educational level, 7 (2.3%) of them did not give information about their mother's educational level. When incomes of the families have been examined, monthly income of 19 (6.3%) students were lower 1000 TL, 164 (54.5%) of them have been between 1000-3000 TL, 73 (24.3%) of them have been between 3000-5000 TL. Monthly income of 15 (5.0%) of students are unknown, on the other hand 30 (10.0%) of the students income have been above 5000 TL.

1. FINDINGS RELATED TO THE SUB PROBLEM OF: "WHAT ARE THE ICTS THE STUDENTS HAVE?"

Table 3. ICTs the students have the ones they are able to use

Variables		N	%	Variables		N	%
How many computers are there at your home?	None	10	3,3	Is there a portable computer at home?	No	120	39,9
	1	149	49,5		Yes	179	59,5
	2	84	27,9		Missing	2	,7
	3 and more	56	18,6		Total	301	100,0
Is there a laptop at home?	No	99	32,9	Is there a computer for everyone at home?	No	250	83,1
	Yes	199	66,1		Yes	43	14,3
	Missing	3	1,0		Missing	8	2,7
	Total	301	100,0		Total	301	100,0
Is there internet connection at home?	No	33	11,0	Is internet connection unlimited at home ?	No	63	20,9
	Yes	266	88,4		Yes	234	77,7
	Missing	2	,7		Missing	4	1,3
	Total	301	100,0		Total	301	100,0
Is your phone	No	59	19,6	Can you connect to	No	27	9,0

smart phone ?	Yes	239	79,4	internet from your mobile phone?	Yes	266	88,4
	Missing	3	1,0		Missing	8	2,7
	Total	301	100,0		Total	301	100,0
Do you have tablet computer? (Before)	No	240	79,7	Can you connect to internet by your computer and mobile phone?	No	108	35,9
	Yes	55	18,3		Yes	175	58,1
	Missing	6	2,0		Missing	18	6,0
	Total	301	100,0		Total	301	100,0
Do you have tablet computer? (Later)	No	0	0,00	Can you connect to internet from your school?	No	212	70,4
	Yes	298	99,0		Yes	73	24,3
	Missing	3	1,0		Missing	16	5,3
	Total	301	100,0		Total	301	100,0

When Table 3 is examined, it would be observed that 3.3% of 9th grade students did not have computers at home. The rate of the students who have only one computer at home is 49.5%, two computers 27.9%, three and more is18.6%. Whereas 32.9% of the students have desktop computers 66.1% of them did not have. Whereas 39.9% of them had laptops in their houses, 59.5% did not have. The rate of students who have individualistic computers belonging to every family member is 14.3%. Whereas there was no internet connection in 11.0% of the homes, 88.4% of them had internet connection. Unlimited internet connection is existent at 77.7% of homes. 79.4% of student mobile phones are smart phones. 1.0% of the students did not give information on this subject 19.6% of the mobile phones are not smart phones. 88.4% of the students are able to connect to the internet from their phones. Whereas, 18.3% of the students have tablet computers before tablets have been given to the students in the frame of FATİH project, all of them had tablet computers later. 58.1% of the students are able to connect to the internet with their mobile phones and with computers. 70.4% of the students claim that they are not able to connect to internet from their schools, 24.3% state that they are able to connect to internet.

2. AFTER TABLET COMPUTERS HAVE BEEN GIVEN TO THE STUDENTS BY THE GOVERNMENT, IS THERE A CHANGE FOR THE STUDENTS AT THE LEVEL OF USING TABLET COMPUTERS?

When Table 4 is examined, it would be observed that there is a meaningful difference at the level of "p<0.05" between the period before and after the tablets have been given to the students in all items taking place at the dimension of students being able to use tablet computers.

Table 4. T-Test related to the level of being able to use tablet

Variables		$\overline{X}$	N	Sd	t	df	p
I know how to protect information in tablet	Before	3,486	294	1,369	-7,179	293	0,00
	After	3,973	294	1,150			
I know transferring the information in the tablet	Before	3,503	292	1,328	-6,782	291	0,00
	After	3,949	292	1,141			
I can use Word program in tablet	Before	2,918	293	1,474	-4,600	292	0,00
	After	3,481	293	2,198			
I can use Excel program in tablet	Before	2,799	294	1,470	7,656	293	0,00
	After	3,293	294	1,453			
I can use PowerPoint program in tablet	Before	3,000	291	1,476	-7,367	290	0,00
	After	3,495	291	1,463			
I can load any program in the tablet	Before	3,737	289	1,299	-6,978	288	0,00
	After	4,246	289	1,033			
I know removing any program from the tablet	Before	3,746	287	1,323	-7,781	286	0,00
	After	4,258	287	1,076			
I can format and reset the tablet	Before	2,906	287	1,503	-6,159	286	0,00

	After	3,289	287	1,520			
I can use my tablet with all its features.	Before	3,399	291	1,215	-6,592	290	0,00
	After	3,869	291	1,062			
I can always connect to internet from tablet	Before	3,378	291	1,365	-6,662	290	0,00
	After	3,866	291	1,177			
I know downloading and protecting the information from internet.	Before	3,613	289	1,281	-6,810	288	0,00
	After	4,076	289	1,093			
I can have information about anything on internet from tablet.	Before	3,495	291	1,388	-7,407	290	0,00
	After	4,010	291	1,170			
I can use tablet comfortably whenever I need.	Before	3,410	290	1,453	-5,403	289	0,00
	After	3,838	290	1,307			
Level of using tablet	Before	3,341	267	1,100	-3,094	266	0,02
	After	3,527	267	,840			

According to paired-Samples T-test results before and after the tablets have been given to the students, it was observed that there is a meaningful difference at "p<0.05" level as "t=3.094" and "p=0.02" have been at level of using tablet. When the data taken from 267 students were examined in Table 3, whereas average related to before the tablets have been given to the students has been " $\overline{X}$ =3.34", average related to after the tablets have been given to the students has been " $\overline{X}$ =3.53". Especially, when the collection of the data in a month after the tablets have been given to the students has been thought about, it was discovered that there is an increase in the usage skill of tablet computers distributed in the frame of FATIH Project.

3. FINDINGS RELATED TO THE SUB PROBLEM OF: "AFTER TABLET COMPUTERS HAVE BEEN GIVEN TO THE STUDENTS BY THE GOVERNMENT, IS THERE A CHANGE FOR THE STUDENTS AT THE LEVEL OF BENEFITING FROM THE OPPORTUNITIES THAT THE TABLET COMPUTERS PRESENT?"

Table 5. T Test related to level of benefiting from the tablet

Variables		$\overline{X}$	N	Sd	t	df	p
I can use tablet with the aim of studying lesson(curriculum, etc)	Before	2,894	292	1,323	-9,088	291	0,00
	After	3,596	292	1,193			
I can use tablet with the aim of protecting information.	Before	2,906	288	1,347	-8,070	287	0,00
	After	3,500	288	1,285			
I can use tablet for more than one course	Before	2,816	288	1,350	-9,382	287	0,00
	After	3,580	288	1,344			
I can use tablet with the aim of entertaining (playing games, music,etc)	Before	3,275	291	1,354	4,899	290	0,00
	After	3,653	291	1,262			
I can use tablet to follow the news (newspaper,etc)	Before	2,739	287	1,378	-5,913	286	0,00
	After	3,153	287	1,440			
I can use tablet with the aim of information (mail, chat vb)	Before	2,879	289	1,420	4,271	288	0,00
	After	3,218	289	1,499			
I can use tablet to follow social media (face. Etc)	Before	3,038	291	1,439	-2,968	290	0,03
	After	3,275	291	1,499			
I can use tablet with the aim of taking course from internet	Before	2,413	288	1,374	-5,358	287	0,00
	After	2,813	288	1,498			
I can use tablet with the aim of making research (doing homework,etc)	Before	3,021	290	1,326	-6,470	289	0,00
	After	3,528	290	1,289			
I can use tablet with the aim of shopping from internet	Before	2,388	291	1,442	-3,179	290	0,02
	After	2,608	291	1,568			
I can use tablet with the aim of following	Before	2,281	292	1,403	-5,235	291	0,00

announcements	After	2,630	292	1,601			
Level of benefiting from the tablet	Before	2,776	260	1,018	-2,964	259	0,03
	After	2,944	260	,914			
General	Before	3,065	294	,974	-8,362	293	0,00
	After	3,518	294	,852			

T-test results before and after the tablet computers have been given to the students related to benefiting from the opportunities they present has been given in Table 5. According to the table, it has been observed that there is a meaningful difference at "p<0.05" level before and after the tablet computers have been given (t=2.964 and p=0.03). When averages were examined, the averages related to benefiting from the opportunities they present has been "2.776" before they have been given, it increased to "2.944" after they have been given. Although the latter average has been at middle level, when it is thought that the distribution of the tablets have been realized recently, it is assumed that this average will increase.

Also, when Table 5 is examined, it was discovered that there is a meaningful difference at "p<0.05" level between the statements measuring the dimension of benefiting from the tablets before and after the distribution. When averages related to every item have been examined, it is observed that the highest increase has been in items "I can use the tablet in more than one course." And "I can use the tablet with the aim of studying lesson." The lowest increase has been determined in the items of "I use tablet to follow social media." and "I can use tablet with the aim of following announcements". On the other hand, it has been determined that the students used the tablet computers for following the announcements from internet" and "making shopping" before they took the tablet computers. The fewest usage of tablet has been on taking courses. These three items have been the least benefiting areas. It has been discovered that there is a meaningful difference at "p<0.05" level before and after the tablet computers have been given in relations to the generality of the scale (t=8.362 and p=0.00). Whereas the average students before the tablets have been given have been as "3.065," the average after they have been given has been as "3.520". It was discovered that there is approximately "0.45" scores increase and this is an advantage for FATIH project.

RESULTS AND DISCUSSION

FATIH project started in 17 cities as a pilot application with the aim of realizing ICT supported teachings by providing ICT to the classrooms for k12 schools in Turkey in 2011-2012 academic sessions. Tablet computers were given to 9th grade students of some high schools in the content of the project in 2013-2014 academic sessions in Sakarya city. The results taken in this research in which tablet computers distributed in the content of FATIH Project have been evaluated in the frame of digital divide on 301 students being educated at 9th grade and the discussions made relates to these results which have been given below:

Whereas 3.3% of the students did not have computers at their homes, nearly half of 301 students have only one computer at home. Yildiz and Seferoglu (2014) determined that only one third of the students have computer and internet access at home in their researches and there has been a gap between the ones who have access and the ones who did not have. However, in our research, before the tablets have been given to the students only 18.3% of students had tablet computers, this rate increased to 100% with FATIH project. As tablet computers given in the content of FATIH Project increased, the number of computers at students' homes, the level of families having ICT also increased. Moreover, there are no more houses which do not have computer with the distribution of tablet computers. This result is an indicator that FATİH Project had an important role to play in preventing the inequalities related to accessing ICT in the frame of digital divide of other family members in addition to that of students.

On the other hand, whereas all of the students had access to ICT by giving them tablet computers, internet access which is seen as a miracle communication device in reaching information (Cheviron, 2006) has not been sufficient in the frame of FATIH Project according to the results. Because it has been determined in the research that 70% of the students cannot connect to internet from their schools. It is an important rate that 88% of the students are able to connect to internet from their houses, 58% of them from their mobile phones by computers and 88% of them only from their mobile phones. In fact, these rates changed differences with Gunduz's (2010) findings before the tablet computers have been given; they matched with his findings after the tablet computers have been given. Because Gunduz reached the result that students' access to the internet has been lower than the access to computer in his research. But, it should not be forgotten that the inability of the students to connect to the internet from school which has an important role in education (Iske, Klein and Kutscher, 2005) will prevent the realization of the aims of the FATIH project.

There has been a meaningful difference in all items at the dimension of students' usage of the tablet computers in the content of FATIH Project before and after the tablets have been given to the students. In other words, when the level of use of the tablet computers has been compared before and after the tablets were given to the students, there has been a meaningful increase. This result supports the ideas of Kurt, Colak and Yildirim (2008) who mentioned that owning a computer plays an important role in the development of technology usage of individuals. When a generalization has been made, it can be said that FATIH Project increased the level of using technology in addition to owning this technology.

It was established that there is a positive increase at the level of students benefiting from the tablets before and after the tablets have been given to them. From this perspective, the highest increase was realized from the usage with the aim of using tablet computers in the courses and studying lessons after the tablets have been given to the students. The lowest increase was realized from the usage of tablets with the aim of following social media and announcements. Also, it has been established as a result that the students benefited mostly from the tablet computers with the aim of entertainment, studying lesson, making research from the internet, using it for more than one course and for keeping information. When it is taken into account that ICT usage increased learning level of the students (Coppock, Smith and Howell, 2009), these results taken in this research can be evaluated as the indicator of increase at learning levels of the students. In addition to these, as Pamuk and others (2013) stated, when teachers used this technology actively in their courses, more increase will be realize in their learning. But, using the tablets with the aim of entertainment mostly can bring some problems as it has been in the usage of mobile phones (Karabacak and Oztunc, 2014). It has been determined that the least benefiting area of the tablets before and after they were given to the students have been following the announcements from internet, making shopping and taking course.

As a result, it has been observed that there is a meaningful difference in positive direction before and after the tablets were given to the students at dimensions and items base in general scale in this research. While this result presents the importance of FATIH Project in preventing digital divide, the result that it has been effective in creating equal opportunity has been reached. When taken from another point of view, poverty is one of the most important reasons of digital divide (Wolf and Kinnon, 2002; Ege, 2008; Eamon, 2004, Liu and San, 2006). But, digital divide is not only related with poverty but also with differences between geographical regions (Yildiz and Seferoglu, 2014a; Ege, 2008; Kezang and Whalley, 2007; Liu and San, 2006; Hess and Leal, 2001), age (Yildiz and Seferoglu, 2014a; Sen and Akdeniz, 2012; Ege, 2008; Atkinson, Black and Curtis, 2008), gender (Sen and Akdeniz, 2012; Yang and Chen, 2010; Ege, 2008; Kilic and Yildirim, 2008; Jackson at al., 2008; Deryakulu, 2007), educational situation (Sen and Akdeniz, 2012) the language used (Liu and San, 2006; Souter, 2007), ethnical origin (Chakraborty and Bomsan, 2005; Clark and Gorski, 2001; Eamon, 2004; White, 2008), the country being lived (Kalayci, 2013; Kilic, 2011; Guillén and Suárez, 2005; Liu and San, 2006; Underwood, 2007; Sen and Akdeniz, 2012;) and residence place (Yılmaz and Ersoy, 2012; Gudmundsdottir, 2010; Nicholas, 2003) individualistic disabling situation (Atkinson, Black and Curtis, 2008), level of benefiting from education (Pick and Azari, 2008), demographical situation of the family (Yilmaz and Ersoy, 2012; Jackson at al., 2008; Ersoy, 2011; Asici and Usluel, 2013; Ono and Zavodny 2007; Kuzu at al., 2008; Kurt, Çoklar, Kiliçer & Yildirim 2008; Ozmusul, 2008) motivation and knowledge deficiencies (Aerschot and Rodousakis, 2008), socio-economic level (Gunduz, 2010; Hohlfeld at al., 2008). None of these variables has not been taken into account while distributing tablet computers in the content of FATIH Project in 2013-2014 academic sessions. Also, tablet computers in the content of FATIH Project only form one part of the project. When it is taken into account that the data used at reaching the results in this research have been collected after a month that the tablet computers have been distributed, it shows that FATIH Project will have an important role in creating equal opportunity and preventing digital divide. For this reason, the result is that the subject of accessing the internet in Turkey should be extended all around the country.

RECOMMENDATIONS

It can be stated that increasing the level of tablet usage and benefiting from the opportunities it presents for the students who use these tablets for meaningful purposes make the application of FATIH Project an obligation in the frame of preventing digital divide. Not only the budget of the government should be used to put this application into practice, but also all civil societies should give moral and financial support. 100% of students have been provided to have a computer by giving them tablet computers in their various schools. At the same time, 100% of students in schools should be provided access to the internet. Having internet access in schools by the students will save poor families from the cost of internet connection services at home (Ege, 2008). Moreover, as these families cannot meet these costs at their homes, there will be gaps between the students in the same classes.

When it is thought that internet has been used mostly to reach knowledge (Orhan and Akkoyunlu, 2004) and more research is being made while using the internet (Ersoy and Turkkan, 2009), access to internet should be seen as an obligation so that the students will benefit from the opportunities that it presents, by providing their usage with all its features as an instrument for reaching knowledge. Also, it should not be forgotten that accessing the internet easily at schools will increase the level of using ICT and benefiting from the opportunities that it presents. In short, digital divide will be prevented. If our request does not increase the gap between the countries, while developed countries are developing some more, everybody should do whatever is needed to prevent the digital divide.

Data was collected in this research the following month after the tablets have been distributed. For this reason, a research on this subject can be carried out again after a period of time. Therefore, after the first students have completed their usage, their tablet usage levels could be tested. In recent times, mobile phones as the latest ICTs have been in the agenda of a lot of researchers, and for this reason, similar study could be organized on mobile phones. Also, FATIH Project is being realized only at k12 schools, but most of the population of the Turkey schools has been above 18 years old. This has given an edge to researches and has also given an important solution to their proposals because with the involvement of such age grade case studies can be easily realized by university students or adults.

REFERENCES

Aerschot, L. V. and Rodousakis, N. (2008). The link between socio-economic background and internet use: barriers faced by low socio-economic status groups and possible solutions. *The European Journal of Social Science Research*, 21 (4), 317-351.

Aşıcı, T. B. and Usluel, Y. K. (2013). Sayısal uçurumun üniversite öğrencilerinin demografik özelliklerine göre incelenmesi. *Hacettepe Universitesi Eğitim Fakültesi Dergisi*. 44, 73-84.

Atkinson, J., Black, R. and Curtis, A. (2008). Exploring the digital divide in an Australian regional city: A case study of Albury. *Australian Geographer*, 39 (2), 479- 493.

Aytun, C. (2005): *Dijital bölünme olgusu ve Türkiye üzerine bir uygulama*, (Yayınlanmamış yüksek lisans tezi) Adana: Çukurova Üniversitesi.

Barrios T. at al. (2004). Laptops for learning: Final report and recommendations of the laptops for learning task force, March 22, 2004. Retrieved in 03.03.2015 from http://etc.usf.edu/l4l/report.pdf.

Chakraborty, J. and Bosman, M. M. (2005). Measuring the digital divide in the United States: Race, income, and personal computer ownership, *The Professional Geographer*, 57 (3), 395-410.

Cheviron, N. T. (Eylul, 2006). Medya okuryazarliği, erişim sorunu, seyirselleşme ve sansasyonelleşme, *I. Medya Okuryazarlığı Konferansı*, Bildiriler Kitabı, Marmara Üniversitesi İletişim Fakültesi Yayınları.

Coppock, K., Smith, B., and Howell, K. (2009). Conceptual mapping of education ecosystem: final report. vital wave consulting. Retrieved in July 11, 2012 from http:// eduscol.education.fr/numerique/textes/rapports/ dossier/ telechargement/effets-positifs-de-le-learning-livre-blancdintel.

Compaine, (2001). *The digital divide: Facing a crisis or creating a myth?* Cambridge: Massachusetts Technology Institute.

Deryakulu, D. (2007). Seçmeli bilgisayar dersi ve bilgisayar öz-yeterlik algisinin 8. sinif öğrencilerinin seçmek istedikleri mesleklerle ilişkisi. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 40 (2), 1-22.

Di Maggio, P., Hargittai, E., Neuman R. and Robinson, J. P. (2001). Social implications of the internet. *Annual Review of Sociology*, (27), 307-336.

Eamon, M. K. (2004). Digital divide in computer access and use between poor and non-poor youth. *Journal of Sociology and Social Welfare*, 31 (2), 91-112.

Ege, G. B. (2008). Dijital ayrım. *Sosyoloji Dergisi*, 19, 43-58.

Ersoy, A. (2011). Turkish primary school children's opinions related to the internet awareness. *International Journal on New Trends in Education and Their Implications*, 2 (1), 24-38.

Ersoy, A. and Turkkan, B. (2009). İlköğretim öğrencilerinin resimlerinde internet algisi. *İlköğretim Online*, 8 (1), 57-73.

Geray, H. (2003). *İletişim ve teknoloji uluslararasi birikim düzeninde yeni medya politikalari*. Ankara: Ütopya.

Gudmundsdottir, G. B. (2010). From digital divide to digital equity: learners' ict competence in four primary schools in Cape Town, South Africa. *International Journal of Education and Development using Information and Communication Technology*, 6 (2), 1-22.

Gulpınar, F., Kuzu, A., Dursun O. O., Kurt A.A. and Gultekin. M. (2013). Milli eğitimde teknoloji kullanimi sonuçlari: Velilerin bakiş açisindan FATIH projesi'nin pilot uygulamasinin değerlendirilmesi. *SDÜ Fen Edebiyat Fakültesi, Sosyal Bilimler Dergisi*, 30, 195-216.

Gunduz, H. B. (2010). Digital divide in Turkish primary schools: Sakarya sample. *The Turkish Online Journal of Educational Tecnology*. 9 (1), 43-53.

Gunduz, H.B. and Hamedoglu, M.A. (2003). Liselerde sayisal kopuş (Sakarya ili örneği), *Sakarya Üniversitesi Eğitim Fakültesi Dergisi*, 6, 214-245.
Hess, F. M. and Leal, D. L. (2001). A shrinking digital divide? The provision of classroom computers across urban school systems. *Social Science Quarterly*, 82 (4), 765-778.
Hangladarom, S. (2006). Global digital divide, global, justice, cultures and epistemology. E. Rooksyby (Ed). *Information Technology and Social Justice.* Hershey, PA, USA: Idea Group.
Hargittai, E. (2013). The digital divide and what to do about it. Derek, C. J. (Ed.) *New Economy Handbook* (pp. 822-841). New Youk: Elsevier Academic Press.
Hohlfeld, T. N., Ritzhaupt, A. D., Barron, A. E. and Kemker, K. (2008). Examining the digital divide in K-12 public schools: Four- year trends for supporting ict literacy in Florida. *Computer & Education,* 51 (4), 1648-1663.
Iske, S., Klein, A. and Kutscher, N. (2005). Differences in internet usage, social inequality and informal education. *Social Work & Society*, 3 (2), 215-223.
Jackson, L. A., Zhao, Y., Kolenic, A., M. A., Fitzgerald, H. E., Harold, R. and Eye, A. V. (2008). Race, gender, and information technology use: the new digital divide. *Cyberpsychology & Behaviour*, 11 (4), 437-442.
Kezang ve Whalley, J. (2007). Closing the digital divide: The role of services and infrastructure in Bhutan. *Prometheus*, 25 (1), 69-84
KB (Kalkınma Bankası) (Mayıs, 2012). Kamu bilgi ve iletişim teknolojileri yatirimi. Kalkınma Bakanlığı Bilgi Toplumu Dairesi. Retrieved in 27.02.2015 from http://www.bilgitoplumu.gov.tr/wp-content/uploads/2014/04/Kamu_BIT_ Yatirimlari_ 2012.pdf.
KB (Kalkınma Bankası) (Mayıs, 2013). Kamu bilgi ve iletişim teknolojileri yatirimlari. Kalkınma Bakanlığı Bilgi Toplumu Dairesi. Retrieved in 27.02.2015 from http://www.bilgitoplumu.gov.tr/Documents/1/Diger/Kamu_BIT_ Yatirimlari_2013. pdf
KB (Kalkınma Bankası) (Mayıs, 2014). Kamu bilgi ve iletişim teknolojileri yatirimlari. Kalkınma Bakanlığı Bilgi Toplumu Dairesi. Retrieved in 27.02.2015 from http://www.bilgitoplumu.gov.tr/Documents/1/Diger/KAMU _BIT_YATIRIM LARI_2014.pdf.
Kalaycı, C. (2013). Dijital bölünme, dijital yoksulluk ve uluslararasi ticaret. *Atatürk Üniversitesi İktisadi ve İdarei Bilimler Dergisi*, 27 (3), 145-162.
Karabacak, K. and Öztunç, M. (2014). The effect of addiction for communication tools on the feelings of shyness and loneliness. *International Journal Of Academic Research Part B.* 6 (1) 368-373.
Kiliç, Ç. (2011). Küresel dünyada kişisel bölünme sorunu. *Erzincan Eğitim Fakültesi Dergisi*, 13 (1), 81-91.
Kiliç, E. and Yildirim, Z. (2008). Understanding net generation: students' profiles on using information and communication teachnologies and their preferences of playing games. *The European Conference on Educational Research* (ECER 2008),
Kotkin, J. (2000). *The bew geograpy: How the digital revolution is reshaping the American landschape.* New York: Random House.
Kurt, A., Coklar, A. N., Kiliçer, K. and Yildirim, Y. (2008). Evaluation of the skills of K-12 students regarding the national educational technology standards for students in Turkey. *The Turkish Online Journal of Educational Technology (TOJET).* 7 (3), 6-14.
Liu, M. and San, G. (2006). Social learning and digital divides: A case study of internet technology diffusion. *KYKLOS: International Review for Social Sciences,* 59 (2), 307-321.
Livingstone, S. and Helsper E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media & Society*, 9 (4), 671-696.
MEB (2011) Eğitimde FATİH projesi. Retrieved in 26.02.2015 from http://fatihprojesi.meb.gov.tr/tr/index.php.
Nicholas, K. (2003). Geo-policy barriers and rural internet access: The regulatory role in constructing the digital divide. *The Information Society*, 19, 287-295.
Norris, P. (2001): *The digital divide*. New York: Cambridge University.
OECD (Organasition for Econemic Co-operation and Development). (2001). *Understanding the digital divide*. Retrieved in 26.02.2015 from http://www.oecd.org/sti/1888451.pdf.
Ono, H. and Zavodny, M. (2007). Digital inequality: A five country comparison using microdata. *Social Science Research*. 36, 1135–1155.
Onur, N. (2007). Dijital bölünme ve gençlik. *Sosyoloji Dergisi Ülgen Oskay'a Armağan Özel Sayısı*, 195-233.
Orhan, F. and Akkoyunlu, B. (2004). İlköğretim öğrencilerinin internet kullanimlari üzerine bir çalişma. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 26, 107-116.
Ozcivelek, R. et al. (2000). Sayısal uçurum: Dünya ve Türkiye'de durum. *VI. Türkiye'de Internet Konferansı*, 9-11 Kasım 2000. Ankara.
Ozmusul, M. (2008). *İlköğretim ikinci kademe öğrencilerinin bilgi ve iletişim teknolojilerinden yararlanma düzeylerinin incelenmesi (Kilis ili örneği),* (Yayınlanmamış yüksek lisans tezi). Gaziantep: Gaziantep Üniversitesi.
Oztürk L. (2002) Dijital uçurumun küresel boyutlari, *Ege Akademik Bakış Dergisi*, 2 (1), 129-139.

Oztürk, L. (2005). Türkiye'de dijital eşitsizlik: TÜBİTAK-BİLFEN anketleri üzerine bir değerlendirme. *Erciyes Üniversitesi İktisadi İdari Bilimler Fakültesi Dergisi*, 24, 111-131.

Pamuk S., Cakir, R., Ergun, M., Yilmaz, H. B. and Ayas, C. (2013). Öğretmen ve öğrenci bakiş açisiyla tablet pc. ve etkileşimli tahta kullanimi: FATIH projesi değerlendirmesi. *Kuram ve Uygulamada Eğitim Bilimleri*, 13 (3), 1799-1822.

Pick, J. B. and Azari, R. (2008). Global digital divide: Influence of socioeconomic, governmental, and accessibility factors on information technology. *Information Technology for Development*, 14 (2), 91–115.

Salinas, R. (2003). Addressing the digital divide through collection development. *Collection Building*, 22 (3), 131-136.

Seferoglu, S. S. and Akbiyik, C. (2007). Bilişim teknolojilerinin okullarda kullanimi: Bilgisayar öğretmenlerinden beklentiler. *Uluslararası Öğretmen Yetiştirme Politikaları ve Sorunları Sempozyumu.* Bildiriler Kitabı, 189-193. Ankara:Hacettepe Üniversitesi Eğitim Fakültesi.

Seferoglu, S. S, Avci, Ü. and Kalayci, E. ,(2008). Sayısal uçurum: Türkiye'deki durum ve mücadelede uygulanabilecek politikalar. *25. Ulusal Bilişim Kurultayı*, 19-21 Kasım 2008, Ankara.

Selwyn, N. (2004). Reconsidering political and popular understanding of the digital divide. *New Media Society*, 6 (3), 341-362.

Servon L. J. and Nelson, M. K. (2001). Community technology centers: Narrowing the digital divide in lowincome, urban communities. *Journal of Urban Affairs*, 23, 279-290.

Solomon, G., Allen N. J., and Resta P. (2003). Toward digital equity: Bridging the divide in education. Baston, MA: Allyn & Bacon

Şen, A. and Akdeniz, S. (2012). Sayısal uçurumla baş etmek: OECD ülkeleri ve Türkiye. *Bilgi Ekonomisi ve Yönetimi Dergisi*. 7 (1), 53-76.

Tien, F. F. and Fu, T. T., (2008). The correlates of the digital divide and their impact on college student learning. *Computers & Education*. 50, 421–436.

Van Dijk, J. and Hacker, K., 2003. The digital divide as a complex and dynamic phenomenon. *The Information Society*, 19 (4), 315-326.4.

Vandenbroeck, M., Verschelden , G., Boonaert , T. and Haute, L. V. (2007). Changes in the digital divide: A case from Belgium. *British Journal of Educational Technology*, 38 (4), 742-743

Wei, K. K.,Teo, H. H.,Chan, H. C. and Tan, B. C. Y. (2011). Conceptualizing and testing a social cognitive model of the digital divide. *Information Systems Research*, 22 (1), 170-187.

Wolff, L. and Mac Kinnon, S. (2002). What is digital divide. *TechKnowLogia International Journal of Technologies for the Advencement of Knowledge and Learning* , 4 (3), 7-9.

Yang, J. C. and Chen, S. Y. (2010). Effects of gender differences and spatial abilities within a digital pentominoes game. *Computers & Education*, 55, 1220-1233.

Yildiz H. and Seferoglu S. S. (2014). Sayısal uçurum ve demokrasi bilincine bakiş: İlköğretim öğrencilerinin görüşleri. *Eğitim ve Bilim.* 39 (171), 86-98.

Yildiz H. and Seferoglu S. S: (2014a). İlköğretim öğrencilerinin sayisal uçurum ile ilgili görüşlerinin çeşitli değişkenler açisindan incelenmesi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi.* 29 (3).

Yildiz H. and Seferoglu S. S. (2013). Sayısal uçurumun önlenmesinde eğitimin işlevi ve bilişim teknolojileri öğretmenlerinin bu süreçte rolü. *Middle Eastern & African Journal of Education Research*, (3), 69-79.

Yilmaz, F. and Ersoy, A. (2012). Beşinci sinif öğrencileri arasindaki dijital bölünmenin çeşitli değişkenler açisindan incelenmesi: Diyarbakır ili örneği. *Mersin Üniversitesi Eğitim Fakültesi Dergisi.* 8 (1) 29-42.

Examination of the Relationship between Internet Attitudes and Internet Addictions of 13-18-Year-Old Students: The Case of Kahramanmaraş*

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ABSTRACT
This study aims to determine internet attitudes and internet addiction levels of 13-18-year-old students and examine the relationship between these variables. The "internet attitude scale", developed by Tavşancıl and Keser (2002) and the "internet addiction scale", developed by Hahn and Jerusalem and adapted into Turkish by Şahin and Korkmaz (2011), were used as a data collection tool. The scales were applied to 286 students who were selected from secondary schools and high schools in the Kahramanmaraş province. The analyses indicated that average internet attitude score of students is 3.661 and this value corresponds to the choice "I agree" in the scale. Also, it was found that average internet addiction score of students is 2.119. The findings show that the students are at the level of probable addiction in terms of tendency to internet addiction. As a result of correlation analysis, a positively significant relationship was found between internet attitude and internet addictions of the students. Also, it was determined through the regression analysis that internet attitudes of students significantly predict their internet addictions.

Keywords: Internet attitude, Internet addiction, Addiction, Secondary school students, High school students.

INTRODUCTION
Today, students grow up in a very different living environment compared with the past. They were born into a period of time when technology and computer are used intensively. Most importantly, today's students do not know how a world without computer, internet and videogames is (Prensky, 2001). Communication and information technologies are developing very fast in our times. Such technologies and internet connection change our lives and offer many benefits for the users (Beard & Wolf, 2001; Büyükaslan, 2002; Kuzu, Çuhadar and Akbulut, 2007). The concept of internet has more functions than information distribution mechanism and advertisement (Paksoy, Ürkmez and Arıcıoğlu, 2003; Weiser, 2001). Besides, internet is a means of interaction where individuals are involved in social communication. More precisely, the Internet has an important place not just in obtaining information, sending or receiving e-mail and shopping but in establishing social communication as well (Lavanco et al., 2008). One of the basic factors that constitute human behavior is attitudes (Kağıtçıbaşı, 1999, p. 129). Although there is no certain consensus on the concept of attitude just like in many concepts in the field of social sciences, (Tavşancıl, 2002, p. 65), attitude is a constant and consistent emotion, belief and tendency which causes us always behave the same way towards objects, individuals, organizations or events (Öncül, 2000). Belief, emotion and tendency are considered important in guiding behaviors of an individual. Due

* This study was presented as a verbal proceeding at the International Congress on Education (ICEFIC).

to the fact that attitude is one of the variables that form the human behavior (Kağıtçıbaşı, 1999, p. 128) and considered as an element that guides behaviors of an individual (Tavşancıl, 2002, p. 65), it is deemed necessary to measure internet attitudes (Bahar, et al., 2009).

Internet technology has led to introduction of new concepts such as online or virtual learning, asynchronous learning, time and space independent learning, virtual classroom, virtual university, internet literacy and virtual education (Çakır and Yalçın, 2006). Undoubtedly, primary schools are one of the most effective institutions for an individual in the process of acquiring and developing basic internet and computer skills (Bahar, et al., 2009). Internet addiction is a phenomenon which is expressed as the use of internet in a harmful and uncontrolled manner. Recently, internet addiction is considered as a psychological problem in science, which may be associated with various psychological problems. In particular, psychologists, educators, psychiatrists and psychological counselors have focused on various studies in the subject area (Kurtaran, 2008; Cengizhan, 2005; Orhan and Akkoyunlu, 2004; Bölükbaş, 2003; Ayaroğlu, 2002; Eichenberg and Ott, 1999; Zimmerl, 1998). Internet addiction is defined as a disease in the "Diagnostic and Statistical Manual of Mental Disorders", called "DSM IV" and published in 1994 by the American Psychiatric Association (Arısoy, 2009). The concept of Internet addiction, which was used in 1995 for the first time, has become a phenomenon associated with various terms in recent years, such as "online addiction", "internet addiction", "net addiction", "internet addiction disorder", "cyber disorder" and "pathologic internet use" (Eichenberg and Ott, 1999). Although there is still no clear definition of internet addiction (Chou, Condron and Belland, 2005), the basic traces are considered to be the failure to limit the use of internet, continuing the use of internet despite academic or social harms and feeling an intensive anxiety in cases when access to internet is limited (Öztürk et al., 2007). Communication technologies and information are progressing very fast in this era. In line with these technologies, internet changes our lives and offers many benefits for its users (Beard and Wolf, 2001; Büyükaslan, 2002; Kuzu, Çuhadar and Akbulut, 2007). The concept of internet has more functions than information distribution mechanism and advertisement (Paksoy, Ürkmez and Arıcıoğlu, 2003; Weiser, 2001). In Turkey, there are many researches which are conducted on the use of internet. In a study conducted on use of internet by primary school students, internet access of students and their purposes of use of internet are examined (Orhan and Akkoyunlu, 2004). According to findings of that study, it is found that majority of students use the internet frequently. Also, it is observed that as students get older the rate of using internet increases and the use for the purpose of playing games decreases and there is an increase in the rate of using internet for purposes like access to information and communication (Şahin, 2009). When the data available in literature is reviewed, it is possible to see many studies which underline that both internet attitudes and internet addictions of students are important in their educational process. Although these studies are conducted on individuals within a certain age group, this study is carried out based on the assumption that the relationship between internet attitudes and internet addictions of 13-18-year-old students, an age range that covers pubescence and adolescence period, which is considered a critical period for individuals.

METHOD

Relational screening model is used in the study. Descriptive statistics were preferred for the data analysis. First of all, internet attitude and internet addiction levels of students were measured. Then, a correlation and regression analysis was made in turn among all data, data of secondary school students and data of high school students in order to identify the relationship between internet attitudes and internet addictions of students.

SAMPLE GROUP

Sample group of the study consists of 111 secondary school students and 175 high school students who study in secondary and high schools affiliated with the Ministry of National Education in the Kahramanmaraş province in the education year of 2013-2014. These students and schools were selected by drawing of lots. First of all, secondary and high schools where the study will be conducted was determined. Then, students who study in different branches of these schools were selected randomly. The gender factor was also considered when selecting the sample group (139 female, 147 male). The number of samples was determined to make sure it is five times higher than the item number of scales (Büyüköztürk, 2014, p. 146). Also, target population of the study consists of secondary and high school students who study in the Kahramanmaraş province.

DATA COLLECTION TOOL

The "internet attitude scale", developed by Tavşancıl and Keser (2002), and the "internet addiction scale", developed by Hahn and Jerusalem and adapted into Turkish by Şahin and Korkmaz (2011), were used as a data collection tool in the study. Cronbach alpha internal reliability coefficients of internet attitude scale and internet addiction scale are 0.890 and 0.858, respectively. In this application, reliability coefficients of said scaled were calculated 0.821 and 0.803, respectively.

PROCESS

The SPSS package software was used in the analysis of research data. 5 columns 4 spaces approach was adopted in order to determine the range of arithmetic means of internet attitude scores of students. The value of this range is 4/5=0.8. Accordingly, it is interpreted as follows: .00-1.79: Strongly Disagree, 1.80-2.59: Disagree, 2.60-3.39: Neutral, 3.40-4.19: Agree, 4.20-5.00: Strongly Agree. Students who constitute the sample group of the study were examined in three groups, namely internet addicts, non-addicts and probable addicts, by considering the overall internet addiction score obtained from the internet addiction scale, standard deviation value, and the lowest and the highest score that can be obtained from the scale. Accordingly, those who get a one score higher than the standard deviation of average score obtained from the internet addiction scale were considered as "addict", those who get a one score lower than the standard deviation as "non-addict", and those who get other scores as "probable addict". Also, in order to determine the relationship between internet attitude and internet addiction of students, the Pearson correlation value was calculated and a positively significant relationship was found ($r=0.337$, $p<0.01$). It is observed that this value is higher based on the data collected from secondary school students ($r=0.381$, $p<0.01$), and lower based on the data collected from high school students ($r=0.329$, $p<0.01$). In addition, a regression analysis was made in order to calculate the regression level of internet attitude of students on their internet addictions and a significant regression relationship was found based on the data collected from all students ($R=0.349$ $p<0.01$). It was identified that this value is higher based on the data collected from secondary school students ($r=0.381$, $p<0.01$), and lower based on the data collected from high school students ($r=0.329$, $p<0.01$).

FINDINGS

Mean and standard deviation values of internet attitudes and internet addiction levels of students are shown in Table 1.

Table 1: Score breakdown of internet attitude and internet addiction levels of students

	N	Mean	Standard Deviation	Min-Max
Internet attitude	286	3.661	0.938	1-5
Internet addiction	286	2.119	0.921	1-5

When Table 1 is examined, it is seen that average internet attitude score of students is 3.661 and this value corresponds to the choice "Agree" in the scale. This finding indicates that internet attitude of students is high. Again, Table 1 shows that overall average internet addiction score of students is 2.119 and standard deviation is 0.921. In the study, addiction status of students who are internet addict, non-addict and probable addict is evaluated considering the overall addiction score obtained from the internet addiction scale and the lowest and the highest score that can be obtained from the scale. Accordingly, those who get a score of 2.119+0.921=3.400 and higher (maximum 5) are evaluated as "addict", those who get a score of 2.119-0.921=1.198 and higher (minimum=1) as "non-addict" and those who get a score between 3.400 and 1.198 as "probable addict". In this stage, mean and standard deviation values of addiction status of students are given in Table 2 based on their internet addiction scores.

Table 2: Descriptive statistics of addiction status based on internet addiction scores

Addiction Status	N	%	Mean	Standard Deviation
Addict	22	7.69	4.045	0.554
Non-addict	69	24.13	1.000	0.000
Probable addict	195	68.18	2.297	0.561

When Table 2 is examined, the data collected from the internet addiction scale indicate that 22 of students are "addict" (7.69%), 69 are "non-addict" (24.13%) and 195 are "probable addict" (68.18%).

Relationship between internet attitudes and internet addictions of individuals

In the study, correlation value was taken into account in order to determine the relationship between internet attitudes and internet addictions of students and a positively significant relationship was identified between their internet attitudes and internet addictions. The table which shows this relationship is given below.

Table 3: The relationship between internet attitudes and internet addictions of students

Relationship	Correlation Value	p
The relationship between internet attitudes and internet addictions of 13-18-year-old individuals	0.337	0.000
The relationship between internet attitudes and internet addictions of secondary school students	0.381	0.000

The relationship between internet attitudes and internet addictions of high school students	0.329	0.000

When Table 3 is examined, it is observed that the relationship between internet attitudes and internet addictions of 13-18-year-old individuals is significant (r=0.337, p<0.05). Also, when the data collected from secondary school students (r=0.381, p<0.05) and the data collected from high school students (r=0.329, p<0.05) are considered, this relationship is also calculated to be significant as well.

Regression Level of Internet Attitudes of Students on Internet Addictions

A regression analysis was made in order to examine what kind of regression relationship exists between internet attitudes and internet addictions. Variance and error values of this regression analysis are shown in the table below.

Table 4: Variance table of regression relationship between internet attitudes and internet addictions of students

Source of Variance	Data Group	Sum of Squares	sd	Mean of Squares	F	p
Regression	Total	30.590	1	30.590	39.397	0.000
	Secondary School	13.525	1	13.525	18.296	0.000
	High School	15.927	1	15.927	20.866	0.000
Error	Total	220.512	284	0.776		
	Secondary School	79.841	108	0.739		
	High School	131.287	172	0.763		
Total	Total	251.101	285			
	Secondary School	93.366	109			
	High School	147.214	173			

When Table 4 is examined, it was found that the regression relationship between internet attitudes and internet addictions of 13-18-year-old students is significant (R=0.349, p<0.05). Also when the data collected from secondary school students (R=0.381, p<0.05) and the data collected from high school students (R=0.329, p<0.05) is examined, this regression relationship is observed to be significant again.

DISCUSSION

When the research data is examined, it is seen that average internet attitude score of students is 3.661 and this value corresponds to the choice “I agree” in the scale. This finding indicates that internet attitude of students is high. Also, the data indicates that overall average internet addiction score of students is 2.119 and standard deviation is 0.921. In the study, addiction status of students who are internet addict, non-addict and probable addict is evaluated considering the overall addiction score obtained from the internet addiction scale and the lowest and the highest score that can be obtained from the scale. Accordingly, those who get a score of 2.119+0.921=3.400 and higher (maximum 5) are evaluated as “addict”, those who get a score of 2.119-0.921=1.198 and higher (minimum=1) as “non-addict” and those who get a score between 3.400 and 1.198 as “probable addict”. Also, when the average and standard deviation values of addiction status of status is examined based on addiction scores, it is observed that 22 of students are “addict” (7,69%), 69 are “non-addict” (24,13%) and 195 are “probable addict” (68,18%). Çelik and Mercimek (2014) also found in their study conducted on internet addiction of university students that 79% of students are probable addicts. This data shows the research finding. In addition, the relationship between internet attitudes and internet addictions of students was examined (r=0.337, p<0.01) and a positively significant relationship was found between dependent variables. This relationship was measured based on the data collected from secondary school students (r=0.381, p<0.05) and the data collected from high school students (r=0.329, p<0.05) and it was observed to be significant. A regression analysis was made in order to examine what kind of regression relationship exists between internet attitudes and internet addictions. As a result of the regression analysis, it was found that the regression relationship between internet attitudes and internet addictions of 13-18-year-old students is significant (R=0.349, p<0.05). When the data collected from secondary school students (R=0.381, p<0.05) and the data collected from high school students (R=0.329, p<0.05) is examined, this regression relationship is observed to be significant again. The literature review includes studies which indicate that internet attitudes are associated with the internet addiction as well as studies which support this data. In their study, Ayas and Horzum (2013) found that families who have a negligent internet attitude have an important role in the internet addiction. Adaptation into Turkish, validity and reliability study of online cognition scale developed by David (2001) were performed

by Keser-Özcan and Buzlu (2005) and it was found that addiction risk increases as the total score from scale increases. Also, in a study conducted by Sargın (2013), the relationship between internet attitude and problematic internet use was examined and a significant relationship was found between internet attitude and total score. In the light of this data, future researches can be conducted on wider audiences. The study can be extended to individuals in different age groups. Also, the relationship between internet attitude and internet addiction can be examined based on different variables.

REFERENCES

Arısoy, Ö. (2009). Internet addiction and its treatment. *Current Approaches in Psychiatry*, 1(1):55-67.

Ayas, T. and Horzum, M. (2013), İlköğretim öğrencilerinin internet bağımlılığı ve aile internet tutumu, *Türk Psikolojik Danışma ve Rehberlik Dergisi*, 4 (39), 46-57.

Bahar, H., Uludağ, E and Kaplan, K. (2009). İlköğretim öğretmenlerinin bilgisayar ve internet tutumlarının incelenmesi (The case of Kars), *Erzincan Eğitim Fakültesi Dergisi*, *11*-2(67-83).

Beard, K., & Wolf, E. (2001). Modification in the proposed diagnostic criteria for internet addiction, *Cyber Psychology & Behavior*, 4(3), 377-383.

Büyüköztürk, Ş. (2014). *Sosyal bilimler için veri analizi el kitabı (Issue 18).* Ankara: Pegem Akademi Yayıncılık.

Chou, C., Condron, L., & Belland, J. C. (2005). A review of the research on internet addiction, *Educational Psychology Review*, 17(4): 363-388.

Çakır, H., and Yalçın, N. (2006). İnternet ve internet'e dayalı sanal dershane sistemi, *Kastamonu Eğitim Dergisi*, 14 (1), 101-112.

Çelik, H. C., and Mercimek, B. (2013). *BÖTE bölümü öğrencilerinin internet kullanma profilleri ve internete yönelik bağımlılık eğilimleri*. 22nd National Educational Sciences Congress, International Participation, Eskişehir Osmangazi University, 5-7 September 2013.

Davis R. (2001). Cognitive-Behavioral model of pathological internet use, *Computer Human Behavior Journal*; 17:187-195.

Eichenberg, C. & Ott, R. (1999). Internet addiction: a mass phenomenon or invention of the media?, *Heise online*, (19)1, 106-111. Retrieved from: http://www.heise.de/ct/99/19/106/.

Kağıtçıbaşı, Ç. (1999). *Yeni İnsan ve İnsanlar*, İstanbul: Evrim Yayınevi.

Keser-Özcan, N. and Buzlu S. (2005). Problemli internet kullanımını belirlemede yardımcı bir araç: "İnternette bilişsel durum ölçeği"nin üniversite öğrencilerinde geçerlik ve güvenirliği, *Bağımlılık Dergisi*, 6(1): 19-26.

Kurtaran, G. (2008). *İnternet bağımlılığını yordayan değişkenlerin incelenmesi*, (Master's Thesis, Mersin University, Institute of Social Sciences, Mersin). Retrieved from: https://tez.yok.gov.tr/UlusalTezMerkezi

Lavanco, G., Catania, V., Milio, A., & Romano, F. (2008). Learning and relationships in the cyberspace, *Proceedings of World Academy of Science: Engineering & Technology*, 28, 473-477.

Orhan, F., and Akkoyunlu, B. (2003). Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) bölümü öğrencilerinin bilgisayar kullanma öz yeterlik inancı ile demografik özellikleri arasındaki ilişki, *The Turkish Online Journal of Educational Technology*, 2(3), 86-93.

Orhan, F., and Akkoyunlu, B. (2004). İlköğretim öğrencilerinin internet kullanımları üzerine bir çalışma, *Hacettepe University Faculty of Education*, 26, 107-116.

Öztürk, Ö. Odabaşıoğlu, G., Eraslan, D., Genç, Y. ve Kalyoncu, Ö. (2007). Internet addiction: Clinical aspects and treatment strategies. *Journal of Dependence*, *8*: 36-41.

Paksoy, T., Ürkmez, N., and Arıcıoğlu, M. (2003). E-ticaretin Kobi'ler tarafından algılanışı ve rekabette bir araç olarak kullanımı: Konya Tarım Makineleri Sanayisi'nde bir uygulama, *Selçuk University Institute of Social Sciences Journal*, (9), 539-557.

Prensky, M. (2001). *Digital Game-Based Learning*. New York: McGraw-Hill.

Sargın, N. (2013). Üniversite öğrencilerinin internete yönelik tutumları ve problemli internet kullanımları, *Turkish Journal of Education*, 2(2),44-53.

Şahin, C. and Korkmaz Ö., (2011), İnternet bağımlığı ölçeğinin Türkçeye uyarlanması, *Selçuk University Ahmet Keleşoğlu Faculty of Education Journal Volume 32, 101-115.*

Şahin, İ. (2009). Eğitsel internet kullanım özyeterliği inançları ölçeğinin geçerliği ve güvenirliği, *Selçuk Üniversitesi Sosyal Bilimler dergisi*, 21, 461-471.

Tavşancıl, E. (2002). *Tutumların ölçülmesi ve SPSS ile analizi*. Ankara: Nobel Yayınevi.

Tavşancıl, E. and Keser, H. (2002). İnternet kullanımına yönelik likert tutum ölçeğinin geliştirilmesi. *Eğitim Bilimleri ve Uygulama*, 1, 79-100.

Music Software in the Technology Integrated Music Education

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ABSTRACT
The role of the teacher has changed as the traditional education methods, techniques and applications have left its place to the student-centered methods, techniques and applications along with the 21st century. Teachers are no more *source and share the information* but they do *guide* students to access information and *manage the process*.

Today, it has become an inevitable requirement that a teacher who guide his student should follow technological developments in his field; master and use the technology in the classroom and integrate it to his lessons. Prensky (2001) who calls today's students as *Net Jeneration* states that these students are all "native speakers" of the language of "digital" by spending hours per day with computers, internet, video games, IPhones, IPads and television and brands them as *Digital Natives*.

This study aims to find out the software used and deemed to be beneficial at music education and the usage of the software in music education. For this purpose the publications, researches and internet sources of current literature were examined by screening method and the data obtained brought together and interpreted. As a result, it was determined that, there is a lot of software able to be used in music education and they provide an effective and efficient education process for both the teachers and learners. Based on these results what needs to be done on this issue was discussed and suggestions were made.

Keywords: Music education, educational technology, music software.

INTRODUCTION

Contemporary education programs generated according to the educational needs that are student-centered; multiple sense organs involving; creativity and productivity targeted are developed for teachers and learners who are following the technological developments and open to develop. In this context the use of technology and technological materials increasingly come to the forefront in today's contemporary educational approach. Günay and Özdemir (2012, p. 33) expressed that the idea of educational technology might be developed by questions like "How can I learn?", "How can I teach easily?", "How can I teach persistent knowledge and skills?" within the learning-teaching environments. In its report TUBITAK (2005) [Scientific and Technological Research Council of Turkey] attracts the attention on the importance of the introduction of information and communication technology (ICT) materials into the schools as a tool and their utilization as an efficient material within the teaching process. TUBITAK lists the main targets and strategies towards the technology based education to be achieved in 2023 as follows (2005, p. 80):

1. The country wide spread of the necessary technological infrastructure for virtual learning should be completed.
2. It should be provided that country specific education models in the developed technological infrastructure environments are added to the system.
3. It should be targeted to become a global leading country in terms of definite products in the field of software technologies.
4. The growth of the brain power to prepare the contents required by the learning models in the virtual environment should be strengthened.
5. It should be provided that all educational institutions are connected to the network and that the educational institutions benefit from the whole technological infrastructure, including the national satellite system, at maximal level.
6. It should be provided that the numeric gap is closed and attention should be paid on the equipment differences at the educational institutions. Priority should be given to areas below the European standards.

7. The conversion of all teachers and instructors such to have the knowledge, skills and equipment in order to develop the materials they need should be completed. It should be provided that educational items able to be shared on the Internet are developed, spread and applied by the teachers.

There is no doubt that in order to achieve these targets determined by TUBITAK, primarily the teachers need to be educated as individuals who fulfil the technological requirements; who at least are good computer users and informed about the technological developments in their fields. Çevik and Alkan (2012, p.135, 138) had evaluated the researches (Niederhauser & Stoddart, 2001; Brush & Saye, 2002; Lynch, 2006; Yenilmez & Sarıer, 2007; Perkmen & Çevik, 2010) performed regarding the utilization of technology in education; the utilization of technology by the teachers and their ability to integrate this technology into the lessons. They determined in these studies that the educators approach towards the utilization of technology within the education is positive; but that many education institutions were not able to fully integrate the utilization of technology into their teacher training programs and that the most of the educators don't have the sufficient experience in terms of the utilization of the technology. Similar results are revealed and argued by Kolburan and Göktaş (2014), Yalçın and Eldemir (2013), Sevinç and Koldemir (2009) and Önlü (2007). Önlü (2007) states that the use of computer technologies in music education is not at the desired level in Turkey and that the applications are more limited with learning notation software and obtaining general culture on the computer technologies used in music education (p.41). A research was conducted by Bauer and McAllister (2003) to determine if 1-week technology workshops can be an effective means for the professional development of music teachers in using technology for instruction. The results indicate that three indicators of effectiveness—teacher knowledge, teacher comfort, and frequency of teacher use—can be significantly improved in these settings. The analysis results obtained from the comprehensive research conducted by Tuti (2005) revealed that only 69 of 1014 students used information technologies in the music lessons. And in the studies conducted by Norton and Sprague (1996) and Cuckle et al. (2000) as quoted by Çevik and Alkan (2012, p.139) it is determined that the efficient utilization of technology during the education and the integration of technology into the music lessons is of great importance for the education. The researchers also revealed that it is necessary to use educational/tutorial software in the curriculum of the faculties of education. In addition to that Çevik and Alkan (2012) stated in the conclusion of their study that candidates thought that by integrating technology in the music class, the lessons would be more joyful; learning would be more permanent and this way of education would increase the motivation of the student for learning or to do research on the topic. Also, candidates who participated in the study listed the deficiencies affecting the integration of the technology into the lessons as; the instructors lack of knowledge on the use of technology, the inappropriateness of the physical conditions of the class environments, the insufficiency of the number of computers for every student, the lack of software, computer programs and technical deficiencies. The participants also suggest that they need to study in this field during their undergraduate education and providing related software and improving the physical environments in order to create appropriate classroom environments should be generated.

Almost every music educator is able to write, make simple drawings, record and copy these by using computers or is able to use his computer for watching and listening to visual or audio media products. But the computers provide two more technological possibilities for music teachers besides listening to music from CDs, playing mp3 tracks, watching videos, presenting visual materials with projectors: the ability to write notes and to record sounds... At present, there are many software options for notation and recording. But it is not possible for a teacher to learn and use all the software -which require a specific knowledge on their own- in detail. However the ability of each music teacher to use some programs accepted in the whole world at a definite level is also a necessity of the contemporary education approach. Based upon these, this study aimed to determine the software that is utilized or used and thought to be useful in music education. For this purpose, the accessible scientific reports, publications and Internet resources related to the subject are examined and a descriptive study was carried out based on the screening model. The data gathered together presented and suggestions were made.

MUSIC SOFTWARE

Today it is possible to mention plenty of software towards music education. Information on computer based music education and music software simply classified and listed along with their access addresses by Peter Webster and David Williams on the website 'teachmusictech.com' (http://www.teachmusictech.com/music_software_list.html). In this study the related music software that is widely used in music education are outlined under five main headings below.

1. Tutorial Software

Tutorial music software covers the programs which include more theoretical information and where the subject related terms are presented as explanations, definitions and questions without establishing an interactive communication between the computer and the student. *Making Music, Music Ace, Smart Music, Music Goals,*

Julliard Music Adventure, Their Lives and Music, Art and Music, Piano Suite Premier can be given as samples for such type of software. Beside this, interactive prepared online tutorial programs also provide visual and auditory content about music styles, music types, music history, famous composers, country music, music instruments etc. While these programs can be used with CD-DVD players, they can also be run on the Internet or be used upon installing them on a computer.

2. Drill and Practice Software

Drill and practice software allow the student to practice and the students are both able to measure and evaluate student's basic knowledge on music history and music theory. Students also perform works regarding musical listening, reading, writing and musical form or harmonic analysis. This software is able to provide a more persistent learning since it allows a drill and practice at desired level and desired amount. While the student can answer the questions by using the computer keyboard, he can also get a feedback by using a microphone. Some of the software stated by Nart (2010), Önlü (2007) and Levendoğlu (2004) are *Ear Master, Note Card 3.3 Music Lesson 1-2, Mibac Music Lessons, Aurailia, Essential of Music Theory, Practica Musica and Music Goals.* There is also some software designed for instrument training among this software which offer an interactive music education. For example *Piano Professor, Guitar Method, The Violin Tutor, Recorder Teacher, Singing Tutor.* Programs like *Bandin-a-Box, Cakewalk, Smart Music, Interactive Songbook and Vivace* which allow the users to accompany the music provided by the software (arranged background music), can be mentioned under this heading.

3. Game Software

In most of this software that is aiming to teach music by games, there is a scoring system (for evaluation) as in the interactive computer games. *Music Ace, Adventure in Music Land, Ear Challenger, Pattern Block Rock, Classics for Kids, Game Roomby NY Philharmonic, Music Lab/Musical Skies/InstrumentGarden/Symphony Hall* and *Music Mountain by SFS Kids.com* and *Maestro: Virtual Orchestra Game* can be considered as examples for this type of interactive software. Also there are many games able to be accessed on the Internet presented at the web address http://www.cornerstoneconfessions.com under the title "*The Ultimate List of Online Music Education Games*" along with their links.

4. Notation Software

Software like *Sibelius, Finale, Encore, Autoscore, Overture, Rhapsody, Music Time, and Magic Score School* can be given as examples for notation software. The most commonly used ones in Turkey are "Finale" and "Sibelius". Notation programs are computer software which allows all the musical elements related to music to be written, edited, arranged and recorded and reproduced according to the rules. Notation prepared with this software can be listened by the sound-cards on the computer and allow the user to make corrections and/or modifications on the work, too. Such that it also contributes to the development of the creativity of the user by this experimental working environment it provides. The sound-card on the computer is sufficient for the vocalization of different instruments sampled with software, but it remains insufficient at the vocalization of country specific folkloric instruments. While sound values of modal music works (sounds with commas) are not included in the software, the musical elements used in modal music are able to be added as figures and fonts to some of these programs.

5. Sequencing and Recording Software

One of the most important headings which come to the forefront by the utilization of computers in music education is the MIDI [Musical Instruments Digital Interface] technology. MIDI can be defined as a numeric data transfer protocol which only transfers and allows the sharing of data between electronic instruments (electro-piano, electro-drum, and electronic wind instruments), computer software and the entire MIDI standard supporting devices. Also stated in the definition, MIDI "transmits only data, no sound". For example, when you press on the key "do" on the keyboard, the MIDI protocol sends multiple data like; at which octave this "do" note is, at which strength it sounds or its musical duration to the software used on the computer in order to record this. While there are sound databases on some electronic instruments with MIDI connection, there are also electronic instruments without a sound database on them and only designed in order to use the sounds of the computer software.

After the subscription of the MIDI protocol in 1982–1983, software in accordance with this protocol are developed. *"Cakewalk", "Cubase", "Logic Audio", "Pro Tools" and "Nuendo"* are some of these software. The most spread used sound recording software in Turkey is "Cubase" (Günay & Özdemir, 2012, p.208). All processes performed with this program are realized with all electronic instruments connected to the computer and supporting the MIDI standard. While the MIDI connection was established only by using a special cable before, the usage of USB cables became widespread for the MIDI data transfer during the recent years. The data

transferred to the computer via the MIDI cable is recorded in to the sequencer section of the software for editing and organizing afterwards. Today there are very advanced audio editors included in some recording software, too. This feature allows the recording of the sounds of instruments and human voice (that are not sampling sounds). Also, this two separate data (MIDI and audio) are able to be processed together by the sequencer and audio editors within the software. This means that a violin performance can be recorded over a piano sound played with MIDI and it can be processed. Cubase, which allows the user to listen the sounds recorded with headphones or speakers, is able to visualize the recorded performance as notes (score) on the screen and allows to print these out.

As a result, there are plenty of useful software for music education and they provide opportunity both the teachers and the students to perform different works at different levels. The software, which can comfortably run on a computer with a sound-card, can now be accessed via smart phones and tablet computers under the title "applications" [mobile apps], too (Theory Lessons, Tenuto, Classicsfor Kids, Auralia, Miso Music, Percussive, Pianist etc.). Beside this smart phones and tablet computers can also be used as equipments which allow MIDI recording. Today, the usage of smart phones and tablet computers as music teaching materials has become widespread. Video images of many musical works done by using "Ipad" are shared by the students/teachers on the Internet.

The computers are leading the most efficient tools among the ICT which allow the access to and utilization of music software. Except for the music education software over the Internet, there are many websites that share information and resources (http://www.musictheory.net/; http://trainer.thetamusic.com/; http:www.teoria.com/). These sites also offer useful materials related to music education and can be shared through computer technology.

Another ICT technology -where the software on them are converted into visuals via computers- is now frequently used in education in Turkey and the world is the "smart board" used in the technology supported classroom called as "smart classroom". *Mimio Vote* is one of the prominent brands with regards to the smart board technology (www.mimio.com). Any white board is able to be converted into a smart board by the infrared technology and with a computer, a projector and a product like Mimio which consists of a control bar, software for music lessons and an interactive pen. With a smart board, the text, audio and virtual images are presented at the same time. This allows both an easy usage for the music teacher and the concretization of abstract subjects. Therefore, it allows both more active and interesting lessons to be processed, as well as allow the course duration to be used more efficiently and effectively.

So far, the software used or/and able to be used in music education was tried to be mentioned in the study. But the main issue to be discussed is how the software needs to be used in music education. Unfortunately, though there are many software used in music education, resources in Turkish which explain the integration of these software into the music lessons with concrete samples are almost not available. In contrary, there are many resources related to the issue are published in English and can be found on the internet. The resources written in a foreign language might be challenging for understanding and usage, but it is thought in this study that it would be appropriate to mention about these sources, too. 'Theory and Practice of Technology-Based Music Instruction' by Jay Dorfman; 'Experiencing Music Technology' by David Brian Williams al; 'Music Education with Digital Technology (Education and Digital Technology)' by Pamela Burnard and John Finney; 'Using Technology to Unlock Musical Creativity' by Scott Watson; 'Integrating Technology with Music Instruction: Using Standard technology teaching tools to aid student learning and teach essential music skills' by Greg Foreman and Kylie Pace; 'Teaching Music with Technology' by Thomas E. Rudolph; 'Technology Integration in the Elementary Music Classroom' by Amy M. Burns; 'Music Outside the Lines: Ideas for Composing in K-12 Music Classrooms' by Maud Hickey; 'Make Music with Your Ipad' by Ben Harvell; 'Musical IPad: Creating, Performing, & Learning Music on Your IPad' by Thomas Rudolph and Vincent Leonard and a book with CD-Rom from Alfred's Music Tech Series named 'Teachers Manual' which in corporates all three of the books in the series (*Composing Music with Notation*, *Playing Keyboard* and *Sequencing and Music Production*) and provides lesson ideas (suggestions that you can reference as you teach each page of the Student Books), assessment possibilities and extension activities (additional activities you can consider to extend the lesson) are some of the published sources to be mentioned in English. There are also several websites that can be mentioned as resources in this area. For instance one of these is "*Association for Technology in Music Instruction (ATMI)"* and the other is "*Technology Institute for Music Educators (TI:ME)*". Both sites provide resources on software and technology products for music educators. '*The Technology Guide for Music Educators*': a book with a wide context presented by TI:ME written by a panel of respected technology specialists and music educators in the field of music technology and edited by Scott Watson is organized into the following six core technology areas that music educators need to be competent in as they teach music in the 21st century; 1. Electronic Musical

Instruments, 2. Music Production, 3. Music Notation Software, 4. Technology-Assisted Learning, 5. Multimedia, and 6. Productivity Tools, Classroomand Lab Management. In addition to descriptions of product features, many other information valuable to educators, such as grade level appropriate ideas for integrating the technologies covered into the music curriculum are mentioned in thebook, too. In the book, each chapter includes a summary table of the products presented (including system requirements and manufacturer websites) and a list of resources, such as a suggestedbfurther reading list. Other two sites which are thought to be useful are*"Kelly's Music and Computers"*(http://kellysmusicandcomputers.com) and Karen Garrett's *"Music Tech Teacher" (*http://www.musictechteacher.com) which provide books, worksheets and video tutorials for learning the software to ensure success in implementing technology solutions.

The goal targeted by the utilization of music software in education matches with the general goals for computer aided education listed by Demirel, Seferoğlu and Yağcı (2001, p.115):

- To increase the motivation of the student,
- To develop the scientific thinking skills of the student,
- To support group activities,
- To expand the teaching methods,
- To develop the self-learning skills of the student,
- To support the development of advanced level thinking skills of students,
- To support finding solutions for problems by the means of logic and
- To encourage students to establish hypothesis.

These targets can be considered as positive outcomes for the student, the teacher and the school at the same time. In addition to these, the emergence of the creativity; the development of the social communication skills and the willingness to share; the ability of the individual to progress at his/her pace; the increase of the attention and confidence; development of the problem solution skills; the provision of savings from the learning-teaching time; ensuring the correct and efficient utilization of the computer and the Internet; development of the documentation, filing and document referring habits; the allowance of repeating; and the increase of the success and may be most importantly, the ability to conduct easy and joyful lessons with active participation may be mentioned among the other benefits provided by software with regards to music education, too.

Instructors can benefit from that mentioned software providing many positive outcomes, in different ways at the music education. The samples below are meant to be suggestions, but may be edited and developed pursuant to the level of the student, the qualification of the instructor, the possibilities and the needs.

1. Any type of musical concept can be taught in a shorter time and concretely by the software, visuals and records.
2. Melody and rhythm exercises can be arranged and done polyphonic.
3. Vocalization or playing over a pre-prepared accompaniment with rhythm and melody instruments can be done. While these accompaniments are able to be written and prepared by the teacher, they also may be available as MIDI in Internet environment.
4. The teacher may control and conduct the class during singing with pre-recorded melodies or accompaniments. Thus both the lesson time would be used well and there would be no need for an accompanist.
5. Subjects such as polyphonic choir, symphony, harmony-counterpoint etc., which cannot be sampled or defined with a single instrument can be presented by software and allow possibilities for applications.
6. Creative activities can be carried out. (Composing for a story, composing lyrics, writing a melody for a text etc.)
7. Rhythm and melody groups can be created and entertainments can be prepared with tablet computers (by using the applications).
8. The student may find the opportunity to record his own work and performance and may able to evaluate, correct and share it.

Though all these positive aspects, it is necessary to mention some of the adverse effects related to the use of software in music education. First of all it's necessary to emphasize that: the role of the teacher doesn't decrease, contrary it increases in technology supported music education enriched with software when compared with the traditional education. If the teacher, who plays the role of a guide, doesn't have the adequate knowledge it will cause unfavourable results in all respects. Therefore, it is necessary that the teacher is equipped with regards to music technologies and the related programs/software and that he/she follows and applies the developments in this field. The teacher needs to plan and program how he/she will use the software in the teaching environment in prior. Thus it will be possible to both use the time effectively and efficient and to find solutions for the

possible problems that may arise as well. Except the problems arising out of the teacher, there might also problems faced with in cases where the physical equipment is deficient or insufficient. In some cases although there are computers, the music software cannot be operated. A reason for this is that most of the software is in English and is not able to be understood. Another reason is that sales prices of the necessary software and hardware imported from abroad are high. Above mentioned negativities are revealed in the researches by Sevinç and Koldemir (2009) and Koç (2004). In addition to these, in cases where the student uses the computer as an individual learning tool without the supervision of a teacher, that study without feedback could negatively affect learning and may result in deficient and/or wrong learning. Beside this, even if ITC allows creative works, it should not be forgotten that music performed with a computer and software will be more restricted and mechanical than a live performance.

CONCLUSION

This study aims to present the data obtained by screening method regarding the software used and deemed to be beneficial at music education and the usage of the software in music education. Today, there are plenty of software able to be used by the music educators. It is thought that this software needs to be used in music education in order to support learning and enrich the learning environment during the learning process; meaning that these need to bear the feature to be a learning/teaching tool for the teacher and the student instead of a purpose. This software can serve for that the student experiences a learning process with active participation through both gaining and spreading musical knowledge and creating music (composing – performing). Beside this, since not every student learns in the same way and same speed, the individual will be provided different learning possibilities and to experience these in a music education organized by benefiting from this software.

The main matter through this process is that the teacher should have comprehensive knowledge of the software he will use and know very well how he will benefit from this software at the education. While the qualification of the teacher in this field will positively influence the education for both the student and the teacher, it will be able to allow the prevention and/or solution of possible negativities, too. Since there are unfortunately no Turkish software, sources and/or teaching materials to be used in the Turkish music education, it is primarily necessary to publish practice oriented information containing sources in the literature. Beside this, it is necessary to determine in detail at which education level music software will be used and with which program the courses will be conducted. In this context, it is necessary to restructure the courses regarding the usage of computers in the undergraduate music teacher programs which contain only theoretical knowledge in terms of the content. In addition to that the related course programs need to be improved as to include the technologies used or able to be used in the music education.

RECOMMENDATIONS

- The applications and developments abroad related to the subject should be examined and tracked and the existing applications in Turkey should be developed.
- The related software and programs should be reviewed by the collaboration of the music education and education technologies departments of the universities and a common terminology should be established and Turkish software and programs should be developed.
- Priorities should be given to the courses related to ICT and music technologies in the professional music education providing institutions and the training of qualified instructors should be considered.
- It should be tried to provide the necessary sources, equipments and possibilities in order to allow the teachers to include music software into their courses.
- Planned and programmed pre-service and service-internal trainings for teachers should be provided; practice oriented works should be conducted.
- It is thought that it would be beneficial to draw attention on the issue through the projects supported by the private organizations and government.
- Also, more researches and applications need to be done in the field and they should be encouraged.

REFERENCES

Bauer, W. I., Reese, S. & McAllister, P. A.(2003). Transforming music teaching via technology: The role of professional development, *Journal of Research in Music Education,* Winter 51(4), pp. 289-301.

Çevik, D. B. & Alkan, M. (2012). Müzik öğretmenliği bölümü öğrencilerinin teknoloji kullanımına yönelik görüşleri, *Journal of Educational and Instructional Studies in the World (WJEIS)*, 2 (1), pp.135-141. [Online]. Available: http://www.wjeis.org/FileUpload/ds217232/File/20x.cevik.pdf [Accesed May 20, 2014].

Demirel, Ö., Seferoğlu, S. S. & Yağcı, E. (2001). *Öğretim teknolojileri ve material geliştirme,* Ankara: Pegem A Yayıncılık.

Günay, E. & Özdemir, M. A. (2012). *Müzik öğretimi teknolojisi ve material geliştirme,* (3. Basım), İstanbul: Bağlam Yayıncılık.

Koç, A. (2004). *Günümüzde bilgisayar destekli müzik yazılımlarının müzik eğitimine katkıları*. Paper presented in 1924-2004 Musiki Muallim Mektebinden Günümüze Müzik Öğretmeni Yetiştirme Sempozyumu, 7-10 Nisan 2004, Isparta: Süleyman Demirel Üniversitesi.

Kolburan-Geçer, A. & Gökdaş, İ. (2014). Öğretmenlerin bilgi ve iletişim teknolojilerinden yararlanma durumlarının bazı değişkenlere gore incelenmesi, *Eğitim Bilimleri Araştırmaları Dergisi –Uluslararası E-Dergi*, 4(1), Nisan 2014. [Online]. Available: http://ebadjesr.com/images/MAKALE_ARSIV/C4_S1makaleler/4.1.05.pdf,[Accesed May 20, 2014].

Levendoğlu, O. (2004). *Teknoloji destekli çağdaş müzik eğitimi.* Paper presented in *1924-2004* Musiki Muallim Mektebinden Günümüze Müzik Öğretmeni Yetiştirme Sempozyumu, 7-10 Nisan, Isparta: Süleyman Demirel Üniversitesi.

Nart, S. (2010). *Deşifre şarkı söyleme öğretimine yönelik deneysel bir öğretim metodu*. Yayınlanmamış doktora tezi. Ankara: Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, GSEABD.

Önlü, A. (2007). *Müzik eğitiminde kullanılan bilgisayar yazılımlarının incelenmesi*. Yayınlanmamış yüksek lisans tezi. Erzurum: Atatürk Üniversitesi, Sosyal Bilimler Enstitüsü, GSEABD.

Prensky, M. (2001). Digital natives, digital immigrants, *On the Horizon, MCB University Press*, 9(5), October 2001. [Online]. Available: http://www.marcprensky.com, [Accesed June 24, 2014].

Sevinç, S. & Koldemir, S. (2009). Anadolu güzel sanatlar liselerinde bilgisayar destekli müzik eğitiminin kullanılabilme durumu, *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi*, Sayı 27, pp. 287 - 305.

TUBİTAK. Vizyon 2023 (2005). *Teknoloji öngörü projesi, eğitim ve insane kaynakları sonuç raporu ve strateji belgesi.* [Online]. Available: http://www.tubitak.gov.tr/tubitak_content_files/vizyon2023/eik/EIK_Sonuc_Raporu_ve_Strat_Belg.pdf, [Accesed May 20, 2014].

Tuti, S. (2005). *Hacettepe Üniversitesi Fen Bilimleri Enstitüsü Eğitimde Bilişim Teknolojileri Kullanımı Performans Göstergeleri, Öğrenci Görüşleri ve Öz-Yeterlik Algılarının İncelenmesi*, Yayınlanmamış yüksek lisans tezi, Ankara: Hacettepe Üniversitesi, Fen Bilimleri Enstitüsü, Bilgisayar ve Öğretim Teknolojileri Eğitimi Anabilim Dalı.

Yalçınkaya, B. & Eldemir, A. C. (2013). Müzik öğretmeni adaylarının Alana yönelik bilgisayar okuryazarlığı düzeylerinin belirlenmesi, *Turkish Studies - International periodical for the languages, literature and history of Turkish or Turkic*, 8(8), Summer 2013, pp. 2185-2195. [Online]. Available: http://www.turkishstudies.net/Makaleler/507287139_132Yal%c3%a7%c4%b1nkayaBeg%c3%bcm-vd-2185-2195.pdf, [Accesed May 20, 2004].

Review of the Technology-Utilization Level of String Instrument Teachers

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ABSTRACT
The purpose of this study is to determine the technology-utilization level of Fine Arts High School string instrument teachers. A pattern based on descriptive method has been used to conduct the researchers. Research data has been collected via literature review and questionnaire developed and prepared by the researcher. SPSS program has been utilized for processing the data. As a result of the analysis carried out in the research, this paper concludes that string instrument teachers make use of computers at the intermediate level and have adequate knowledge on its area of utilization in the Internet and music, and benefit from the Internet in instrument courses as well. The paper also concludes that in the classes the technology-utilization level of viola teachers is the highest; cello and contrabass teachers rather make their students watch videos while viola teachers mostly make use of tuning programs. Moreover, string instrument teachers commented that video camera recording can be used for beginner level instrument courses but that there were not adequate resources to teach viola as the technological advancement in Turkish Music is not enough. One of the string instrument teachers also stated that technology-utilization is not necessary for instrument training. Taking these findings into account, the paper offers some views and suggestions in order to respond to today's requirements and to guide instrument training course in this direction.

Keywords: Music education, string instrument training, technology-utilization.

INTRODUCTION
The last century witnessed a significant technological advancement in human history. Technology and new gadgets became indispensible part of daily life. Thanks to smart phones, tablets, laptop computers and the Internet, it is now possible to access information instantly and easily all over the world. In line with these developments, technology-utilization has also become mandatory in the field of education.

The use of technology in education is evaluated in terms of its purposes, methods and proportion as a new field, namely the "educational technology" emerged (Başuğur, 2009: 1). Educational technology has been developed to improve learning process. Educational technology is a set of a systems and techniques used for improving learning process. Educational technology is fundamentally the activity of putting certain content into practice through appropriate processes and to assess their application results (Demirel, Seferoğlu and Yağcı, 2001:115). Educational technology also found place in music education as well.

As it is case in all fields, technological advancement in the field of music is rapid in today's world and its area of use is constantly expanding. Technology was the most effective tool for changing music perspective in the last century. Another remarkable point is that, when compared to other fields in technological development, music is placed among the fastest changing fields (Arapgirlioğlu, 2003:160).

Technology, which made a haphazard progress starting from the end of the 19th century and especially in the 20th century, made music to be listened widely and resolved the disconnection between the composer and the audience. Thanks to the instruments provided by new technology, music gained an unprecedented diffusivity (Say, 1997:507).

Without any doubt, the invention of numerous new electronic instruments directly affects music education and training at schools. Now, in many countries, education is carried out with the support of technology at all levels of music education similar to other fields of education. Latest developments in the field of musical technology present new opportunities in basic music fields and such subfields as music theories, music history, music

literature, music education and performance for the teachers and students as well. Music instructors use the Internet, television, video, video cameras DVDs, CDs, electronic pianos, computers, computer software, MIDI and similar technologies in the classrooms to advance their students' with knowledge and skills, to increase performances, improve their abilities to play instruments and singing skills and increasing creativity and motivation for themselves and their students (Tecimer, 2006: 8).

Supporting music education carried out with the help of technology using audio-visual elements will not only smooth students' perception of instruction, but it may also help memorability. Furthermore, it is possible to claim that the technology-backed courses may increase the performance of the teachers.

Currently, basic activities like notating, composing, arrangement, vocalizing, broadcasting music data, developing music software, organizing music data, sharing all kinds of information via internet have become easier thanks to advanced technology. Along with the facilitation of those important activities, the development of the instruments called "keyboard" and "synthesizer" and invention of a common protocol enabling the communication between instruments ("Musical Instrument Digital Interface – MIDI), which can be considered as the continuation of this structure, marked a new epoch in terms of both education and performance. Also in music education, thanks to the increase in the number of software created for specific targets, the structure of education in this field has been changing and developing. The software development not only assist music teachers for improving themselves, but it also contribute to the individual and group works of the students studying in this field through new methods (Wilkinson, 1997).

When Computer-Assisted Instruction (CAI) in music is examined, it is observed that it facilitates practices in various fields of music and themes like music theory, composing, reading crotchet, dictation, ear-training, instrumental performance, rhythmic works, musical symbols and terminology, musical analysis through listening, creativity, fret and rhythm familiarization exercises, scale and arpeggio studies (Koç, 2002: 2).

In today's world, the Internet is an indispensible part of human life. Sending and receiving e-mails, searching the Internet for any subject and shopping online has become a daily habit. In any given subject, the amount of information presented on the Internet is unbelievable (Tecimer, 2006:8). Without any doubt, it is possible to make use of the opportunities presented by the Internet in music education as well. By means of instrument teachers can improve their knowledge and can also share their knowledge via social networks. The Internet can be considered as a resource for instrument and for teachers and students in many aspects such as listening to music, video tracking, copying, downloading musical notes and having access to any kind of information instantly.

One of the most important Internet technologies assisting instrument training is online education. Thanks to online education systems, music education is no longer limited to usual classroom environment. It is possible to engage an audio-visual training activity with an instrument via the Internet. In such a setting the teacher could be anywhere in the world without having to be in the same place with students. This system is also used in numerous areas of music education including music theory, vocal training, music history and composers.

It is possible to claim that difficulties faced by instrument teachers in the past are now over, albeit to some degree. It can be said that as long as the correct key is used, no information is inaccessible. Until a few years ago it was quite difficult to reach the notes of any musical piece/study let alone its sound recording; however thanks to social networks, even live performances in different interpretations are now easily accessible (Ayhan, 2012: 176).

Using the knowledge through carrying latest technology to the classrooms by teachers will definitely contribute to the development of students. In any case, exchange of knowledge is inevitable in our information age and this process operates rapidly. Adaptability of the institutions to this period of rapid change depends on their ability to fulfil the tasks expected from them and to play required roles (Langenberg and Spicer, 2001: 45). In this direction, this research aims to review technology-utilization level of string instrument teachers.

Problem Status

It is possible to claim that, similar to other areas of education, active utilization of technology in instrument training will influence the development of instrument for teachers and students to a great extent and increase the efficiency. In order to respond to today's requirements and to lead education and training processes in this direction, teachers are expected to actively utilize technology. The idea that considerable increase in the availability of technology in education and its easy accessibility and attainability for the classrooms may

contribute to more efficient teaching and to increased operability of the string instrument training courses constitutes the problem status of this study.

Sub Problems

- What is the computer-utilization level of string instrument teachers?
- What is the Internet-utilization level of string instrument teachers?
- Is there a meaningful relationship between the technology-utilization level of string instrument teachers and gender?
- Is there a meaningful relationship between the technology-utilization level of string instrument teachers and period of service?
- Is there a meaningful relationship between the technology-utilization level of string instrument teachers and instruments?
- What are the opinions of string instrument teachers about utilizing technology in the instrument training courses?

Purpose of the Research

The purpose of this research is to review the technology-utilization level of string instrument teachers in Fine Arts High Schools as technology has become an indispensible part of education in recent years and has a vast area of use in music education.

The Significance of the Research

The development of new methods and techniques in the field of music education together with the technological advancement has opened new doors in music education. It is thought that teachers have to follow, search and use these latest developments in the classroom in order to benefit from these novelties and to respond to the necessities of the time. Based upon this idea, this research is significant in terms of identifying the technology-utilization level of string instrument teachers in Fine Arts High Schools and locating the degree of advantages of technology used in string instrument training as supportive sources.

METHOD

This research is a descriptive study for determining the current situation. The data is collected through literature review and questionnaire. One Way Anova Test has been used to process the collected data comparing figures, percentages, averages, standard deviation and data.

Population Sample

The string instrument teachers working in the Fine Arts High Schools constitute the population of this research. The sample of the research is a total of 32 string instrument teachers working in Diyarbakir Fine Arts High School, Istanbul Avni Akyol Fine Arts High School, Izmir Umran Baradan Fine Arts High School, Mersin Nevit Kodallı Fine Arts High School, Nigde Fine Arts High School, Trabzon Akcaabat Fine Arts High School and Van Fine Arts High School, which were selected randomly from different seven geographical regions for the 2012-2013 school year.

Data Collection

Research data has been collected through literature review while the questionnaire has been developed and prepared by the researcher. There are seven questions about personal information, 14 close-ended questions and 1 open ended question on the opinions of string instrument teachers about technology-utilization in the questionnaire.

Analysis of Data

The data collected in the research has been analysed using SPSS (Statistical Package for Social Sciences) Windows 21.0 Program. Descriptive statistical methods (figures, percentages, averages and standard deviation) have been put into use during data evaluation. To compare quantitative data One Way Anova Test has been used. Acquired findings have been evaluated at 95% confidence interval and 5% significance level.

FINDINGS AND INTERPRETATION

This part includes the findings acquired as a result of the analysis of data collected through the questionnaire from the Fine Arts High School teachers who participated in the research to solve research problem. Explanations and interpretations have been made based upon the research findings.

Table 1: Specific Characteristics of String Instrument Teachers

Tables	Groups	Frequency (n)	Percentage (%)
Gender	Male	20	62.5
	Female	12	37.5
	Total	32	100.0
University	Marmara	7	21.9
	Yüzüncü Yıl	6	18.8
	Gazi	5	15.6
	Karadeniz Teknik	4	12.5
	İnönü	3	9.4
	Niğde	3	9.4
	Dokuz Eylül	2	6.2
	Uludağ	1	3.1
	İzzet Baysal	1	3.1
	Total	32	100.0
String Instrument	Violin	18	56.2
	Viola	10	31.2
	Violoncello	3	9.4
	Contrabass	1	3.1
	Total	32	100.0
Period of Service	More than 10 years	13	40.6
	5-10 Years	12	37.5
	1-5 Years	7	21.9
	Total	32	100.0
Computer Ownership Status	Yes	32	100
	No	-	-
	Total	32	100
Computer and its Area of Use in Music Knowledge Level	Yes	14	43.8
	Partial	13	40.6
	No	5	15.6
	Total	32	100.0
Internet and Musical Websites Knowledge Level	Yes	19	59.4
	Partial	11	34.4
	No	2	6.2
	Total	32	100.0

Table 1 illustrates that 20 (62.5%) of the participant string instrument teachers are male while 12 (37.5%) are female.

As far as universities are concerned, ,7 (21.9%) of the participant string instrument teachers are from Marmara University, 6 (%18.8) of them from Yüzüncü Yıl University, 5 (%15.6) of them from Gazi University, 4 (%12.5) of them from Karadeniz Teknik University, 3 (%9.4) of them from İnönü University, 3 (%9.4) of them from Nigde University, 2 (%6.2) of them from Dokuz Eylül University, 1 (%3.) of them from Uludağ University and 1 (%3.1) of them from Abant İzzet Baysal University.

When the string instrument teachers participated in this research and were evaluated in accordance with their instruments, the research revealed that 18 (%56.2) of them are violin teachers while 10 (%31.2) of them are viola, 3 (%9.4) of them are violoncello and 1 (%3.1) of them is contrabass teachers.

In terms of period of service, 13 (40.6%) of the string instrument teachers have served for 10 years and more while 12 (%37.5) of them served for 5-10 years, and 7 (%21.9) of them served for 1-5 years.

It is also observed that all of the participant string instrument teachers own a computer. This situation can be interpreted that the string instrument teachers are not too distant from technology.

14 (43.8%) of the participant string instrument teachers have adequate knowledge about computers and their use in music education, while 13 (40.6%) have partial knowledge and 5 (18.8%) do not have adequate information. This situation leads to a conclusion that most of the string instrument teachers have adequate knowledge about computers and their use in music education.

19 (59.4%) of the participant string instrument teachers have adequate knowledge about the Internet and musical websites while 11 (34.4%) have partial knowledge and 2 (6.2%) does not have adequate information. This situation again leads to the conclusion that most of the string instrument teachers have an adequate knowledge of the Internet and musical websites.

Table 2: Technology Utilization Level

	N	Mean	SD	Min.	Max.
Technology Utilization Level	32	3.281	0.789	1.330	4.530

"Technology utilization level" of the string instrument teachers participated in this research has been determined as medium level (3.281 ± 0.789).

Participant string instrument teachers' responses to the statements about technology utilization level are given in the Table 3.

Table 3: Variance of the responses of string instrument teachers to the statements about technology utilization level

	Never		Rarely		Partially		Usually		Always			
	f	%	f	%	f	%	f	%	f	%	Mean	SD
Benefiting from computers in instrument training courses	2	6.2	4	12.5	10	31.2	12	37.5	4	12.5	3.370	1.070
Benefiting from instrument training courses	2	6.2	0	0.0	10	31.2	14	43.8	6	18.8	3.690	0.998
Benefiting from the musical note archives on the Internet for the musical pieces to be performed by students	1	3.1	0	0.0	6	18.8	16	50.0	9	28.1	4.000	0.880
Benefiting from the methods available on the Internet apart from the textbooks used for instrument training courses	3	9.4	2	6.2	4	12.5	14	43.8	9	28.1	3.750	1.218
Having students listen to sound recordings of the musical pieces to be performed	1	3.1	1	3.1	4	12.5	12	37.5	14	43.8	4.160	0.987
Having students watch the videos of the musical pieces to be performed	1	3.1	5	15.6	7	21.9	8	25.0	11	34.4	3.720	1.198
Benefiting from the accompaniments available or in MIDI format for the accompaniments of musical pieces to be performed	13	40.6	4	12.5	10	31.2	4	12.5	1	3.1	2.250	1.218
Enabling students to listen to their own performances by recording their studies/pieces	7	21.9	8	25.0	9	28.1	4	12.5	4	12.5	2.690	1.306
Giving assignments to students to encourage Internet research for their musical instruments	2	6.2	3	9.4	5	15.6	12	37.5	10	31.2	3.780	1.184
Benefiting from the musical dictionary websites in instrument training courses	6	18.8	4	12.5	12	37.5	6	18.8	4	12.5	2.940	1.268
Benefiting from websites to teach students theoretical information (instruments, composers, epochs etc.)	1	3.1	3	9.4	4	12.5	14	43.8	10	31.2	3.910	1.058
Using tuning programs in courses	17	53.1	4	12.5	3	9.4	2	6.2	6	18.8	2.250	1.606
Using metronome programs in courses	19	59.4	7	21.9	4	12.5	2	6.2	0	0.0	1.660	0.937

Exchanging opinions with string instrument teachers in other cities via social networks	5	15.6	8	25.0	8	25.0	6	18.8	5	15.6	2.940	1.318
Opinion of technology utilization will increase the instrument motivation of students	1	3.1	2	6.2	4	12.5	10	31.2	15	46.9	4.120	1.070

The research found that while 12 (37.5%) of the string instrument teachers participated in this research usually benefit from computers, 10 (31.2%) partially benefit, 4 (12.5%) always benefit, 4 (12.5%) rarely benefit and 2 (6.2%) never benefit. It is clear that string instrument teachers moderately agree (3.370 ± 1.070) with the statement that "I benefit from computers for instrument training courses". This leads to a conclusion that the string instrument teachers carry out their courses with the help of computers.

It is observed that while 14 (43.8%) of the string instrument teachers participated in this research usually benefit from the Internet, 10 (31.2%) partially benefit, 6 (18.8%) always benefit and 2 (6.2%) never benefit. It can be said that string instrument teachers highly agree (3.690 ± 0.998) with the statement that "I benefit from internet for instrument training courses". This leads to a conclusion that the string instrument teachers adequately make use of the Internet.

The study found that while 16 (50.0%) of the string instrument teachers participated in this research usually benefit from the musical note archives on the Internet for the musical pieces to be performed by students, 9 (28.1%) always benefit, 6 (18.8%) partially benefit and 1 (3.1%) never benefits. Accordingly, teachers highly agree (4.000 ± 0.880) with the statement that "I benefit from the musical note archives on the Internet for the musical pieces to be performed by students". This leads to a conclusion that the string instrument teachers are aware of the websites where musical note archives exist and actively use this websites in their courses.

The study found that while14 (43.8%) of the string instrument teachers participated in this research usually benefit from the methods on the Internet apart from textbooks used for instrument training courses, 9 (28.1%) of them always benefit, 4 (12.5%) partially benefit, 3 (9.4%) never benefit and 2 (6.2%) rarely benefit. Based on this data it observed that teachers highly agree (3.750 ± 1.218) with the statement that "I benefit from the methods on the Internet apart from the textbooks used for instrument training courses". This leads to the conclusion that most of the string instrument teachers use methods available on the Internet, in addition to the textbooks, as supportive resources in their courses.

The study revealed that while 14 (43.8%) of the string instrument teachers participated in this research always encourage students to listen to sound recordings of the musical pieces to be performed, 12 (37.5%) usually do this, 4 (12.5%) do this partially, 1 (3.1%) do it rarely and 1 (3.1%) never does this. Clearly, teachers highly agree (4.160 ± 0.987) with the statement that "I have students listen to sound recordings of the musical pieces to be performed". This data leads to the conclusion that the string instrument teachers attach importance to having students listen to sound recording of the musical pieces which enables students to gain insight about the interpretation of the pieces performed.

It is observed that while 11 (34.4%) of the string instrument teachers participated in this research always encourage students to watch videos of the musical pieces to be performed, 8 (25.0%) usually encourage, 7 (21.9%) partially encourage, 5 (15.6%) rarely encourage and 1 (3.1%) never encourage their students. The data indicates that teachers highly agree (3.720 ± 1,198) with the statement that "I ecourage students watch the videos of the musical pieces to be performed". When this data is interpreted, it can be concluded that most of the string instrument teachers benefit from the existing video recordings on the Internet.

It is observed that while 13 (40.6%) of the string instrument teachers participated in this research never benefit from the accompaniments available or in MIDI format for the accompaniments of musical pieces to be performed, 10 (31.2%) partially benefit, 4 (12.5%) usually benefit, 4 (12.5%) rarely benefit and 1 (3.1%) always benefit. The research suggests that teachers weakly agree (2.250 ± 1.218) with the statement that "I benefit from the accompaniments available or in MIDI format for the accompaniments of musical pieces to be performed". This situation leads to the conclusion that the string instrument teachers do not adequately benefit from technology-aided accompaniments.
It is observed that 9 (28.1%) of the string instrument teachers participated in this research partially enable students to listen to their own performances by recording their studies/pieces, while 8 (25.0%) do it rarely, 7 (21.9%) never do it, 4 (12.5%) usually do it and 4 (12.5%) always do it. These figures tell us that teachers moderately agree (2.690 ± 1.306) with the statement that "I enable students to listen to their own performances by recording their studies/pieces". This situation leads to the conclusion that a minor part of the string instrument

teachers enable students to listen to their own performances by recording their studies/pieces and increase awareness level of the students.

The study found that while 12 (37.5%) of the string instrument teachers participated in this research usually give assignments to students to encourage them research the Internet for their instruments, 10 (31.2%) always do this, 5 (15.6%) partially do this, 3 (9.4%) rarely do this and 2 (6.2%) never do this. This means that teachers highly agree (3.780 ± 1.184) with the statement that "I give assignments to students to encourage them research the Internet for their instruments". This situation leads to the conclusion that most of the string instrument teachers enable students to familiarize themselves with their instruments by giving Internet-based research assignments to students.

It is observed that while 12 (37.5%) of the string instrument teachers participated in this research partially benefit from the musical dictionary websites for instrument training courses, 6 (18.8%) usually do benefit 6 (18.8%) never benefit, 4 (12.5%) rarely benefit and 4 (12.5%) always benefit. Accordingly, teachers moderately agree (2.940 ± 1.268) with the statement that "I benefit from the musical dictionary websites for instrument training courses". This data can be interpreted that string instrument teachers do not adequately benefit from the musical dictionary websites.

It is observed that while 14 (43.8%) of the string instrument teachers participated in this research usually benefit from websites to teach students theories 10 (31.2%) always do this, 4 (12.5%) partially do this, 3 (9.4%) rarely do this and 1 (3.1%) never does it. The data suggests that teachers highly agree (3.910 ± 1.058) with the statement that "I benefit from websites to teach students theories (instruments, composers, epochs etc.)". According to this, most of the string instrument teachers benefit from websites to teach their students theories.

It is observed that while 17 (53.1%) of the string instrument teachers participated in this research never use tuning programs in their courses, 6 (18.8%) always do, 3 (9.4%) partially do, 2 (6.2%) usually do and 4 (12.5%) rarely do. Accordingly, teachers weakly agree (2.250 ± 1.606) with the statement that "I use tuning programs in courses". According to this, it can be concluded that string instrument teachers do not benefit from tuning programs in courses.

It is observed that 19 (59.4%) of the string instrument teachers participated in this research never use metronome programs in courses, while 7 (21.9%) rarely do, 4 (12.5%) partially do and 2 (6.2%) usually do. Apparently, teachers very weakly agree (1.660 ± 0.937) with the statement that "I use metronome programs in courses". According to this, it can be concluded that string instrument teachers do not benefit from metronome programs in their courses.

It is observed that 8 (25.0%) of the string instrument teachers participated in this research partially exchange opinions with string instrument teachers in other cities via social networks, while 8 (25.0%) rarely do, 6 (18.8%) usually do, 5 (15.6%) always do and 5 (15.6%) never do. This indicates that teachers moderately agree (2.940 ± 1.318) with the statement that "I exchange opinions with string instrument teachers in other cities via social networks". It is been observed that the string instrument teachers do not have an adequate communication. However, it is thought that communication is a necessity in order to be aware of the developments and innovations in the field of education and to provide a sound education to the students around the country.

It is observed that 15 (46.9%) of the string instrument teachers participated in this research are always of the opinion that technology utilization increases the instrument motivation of students, while 10 (31.2%) usually feel that way, 4 (12.5%) partially feel that way, 2 (6.2%) rarely feel that way and 1 (3.1%) never feel that way. It means that teachers highly agree (4.120 ± 1.070) with the statement that "I am of the opinion that technology utilization increases the instrument motivation of students". This figures suggest that string instrument teachers attach importance to technological support and that technology has positive influence on students.

Table 4: Technology Utilization Level by Gender

	Group	N	Mean	SD	T	P
Technology utilization level	Male	20	3.340	0.725	0.537	0.595
	Female	12	3.183	0.912		
Benefiting from computers for instrument training courses	Male	20	3.500	1.051	0.849	0.402
	Female	12	3.170	1.115		
Benefiting from internet for instrument training courses	Male	20	3.750	0.967	0.451	0.655
	Female	12	3.580	1.084		

Benefiting from musical note archives on the Internet for the musical pieces to be performed by students	Male	20	4.200	0.696	1.711	0.097
	Female	12	3.670	1.073		
Benefiting from the methods available on the Internet apart from the textbooks used for instrument training courses	Male	20	3.850	1.268	0.593	0.557
	Female	12	3.580	1.165		
Having students listen to sound recordings of the musical pieces to be performed	Male	20	4.350	0.745	1.459	0.155
	Female	12	3.830	1.267		
Having students watch the videos of the musical pieces to be performed	Male	20	3.900	1.210	1.109	0.276
	Female	12	3.420	1.165		
Benefiting from accompaniments available or in MIDI format for the accompaniments of musical pieces to be performed	Male	20	2.400	1.231	0.896	0.377
	Female	12	2.000	1.206		
Enabling students to listen to their own performances by recording their studies/pieces	Male	20	2.750	1.333	0.344	0.733
	Female	12	2.580	1.311		
Giving assignment to students to encourage Internet research for their instruments	Male	20	3.650	1.089	0.805	0.427
	Female	12	4.000	1.348		
Benefiting from the musical dictionary websites for instrument training courses	Male	20	2.950	1.395	0.071	0.944
	Female	12	2.920	1.084		
Benefiting from websites to teach students theories (instruments, composers, epochs etc.)	Male	20	3.800	1.005	0.728	0.472
	Female	12	4.080	1.165		
Using tuning programs in courses	Male	20	2.250	1.585	0.000	1.000
	Female	12	2.250	1.712		
Using metronome programs in courses	Male	20	1.650	0.933	0.048	0.962
	Female	12	1.670	0.985		
Exchanging opinions with string instrument teachers in other cities via social networks	Male	20	3.050	1.356	0.617	0.542
	Female	12	2.750	1.288		
Opinion of technology utilization will increase the instrument motivation of students	Male	20	4.050	1.146	0.506	0.617
	Female	12	4.250	0.965		

The results of the t-test was applied to the data in order to find out whether technology utilization level of the string instrument teachers participated in the research shows a meaningful variation by gender. However, no statistically meaningful variation was observed ($p>0.05$).

Table 5: Technology Utilization Level Averages by Period of Service

	Group	N	Mean	SD	F	P
Technology utilization level	1-5 Years	7	3.343	0.858	1.407	0.261
	5-10 Years	12	3.533	0.610		
	+ 10 Years	13	3.015	0.871		
Benefiting from computers for instrument training courses	1-5 Years	7	3.290	1.113	0.354	0.705
	5-10 Years	12	3.580	0.900		
	+ 10 Years	13	3.230	1.235		
Benefiting from the Internet for instrument training courses	1-5 Years	7	4.000	0.816	2.517	0.098
	5-10 Years	12	4.000	0.739		
	+ 10 Years	13	3.230	1.166		
Benefiting from musical note archives on the Internet for the musical pieces to be performed by students	1-5 Years	7	4.140	1.069	0.742	0.485
	5-10 Years	12	4.170	0.718		
	+ 10 Years	13	3.770	0.927		
Benefiting from methods on the Internet apart from the textbooks used for instrument training courses	1-5 Years	7	4.290	1.113	1.316	0.284
	5-10 Years	12	3.830	0.937		
	+ 10 Years	13	3.380	1.446		
Having students listen to sound recordings of the musical pieces	1-5 Years	7	4.430	1.134	1.108	0.344

to be performed	5-10 Years	12	4.330	0.778		
	+ 10 Years	13	3.850	1.068		
Having students watch the videos of the musical pieces to be performed	1-5 Years	7	4.000	1.155		
	5-10 Years	12	3.920	0.996	0.855	0.436
	+ 10 Years	13	3.380	1.387		
Benefiting from accompaniments available or in MIDI format for the accompaniments of musical pieces to be performed	1-5 Years	7	1.860	1.215		
	5-10 Years	12	2.750	0.965	1.726	0.196
	+ 10 Years	13	2.000	1.354		
Enabling students to listen to their own performances by recording their studies/pieces	1-5 Years	7	2.290	1.380		
	5-10 Years	12	3.080	1.240	0.965	0.393
	+ 10 Years	13	2.540	1.330		
Giving assignments to students to encourage Internet research for their instruments	1-5 Years	7	3.430	1.512		
	5-10 Years	12	3.920	1.165	0.392	0.679
	+ 10Years	13	3.850	1.068		
Benefiting from the musical dictionary websites for instrument training courses	1-5 Years	7	3.140	1.345		
	5-10 Years	12	3.170	1.586	0.693	0.508
	+ 10Years	13	2.620	0.870		
Benefiting from websites to teach students theories (instruments, composers, epochs etc.)	1-5 Years	7	4.140	1.069		
	5-10 Years	12	4.000	0.739	0.471	0.629
	+ 10 Years	13	3.690	1.316		
Using tuning programs in courses	1-5 Years	7	1.860	1.574		
	5-10 Years	12	2.750	1.765	0.945	0.400
	+ 10 Years	13	2.000	1.472		
Using metronome programs in courses	1-5 Years	7	1.140	0.378		
	5-10 Years	12	2.250	1.138	5.054	**0.013**
	+ 10 Years	13	1.380	0.650		
Exchanging opinions with string instrument teachers in other cities via social networks	1-5 Years	7	3.860	1.464		
	5-10 Years	12	3.000	1.414	3.281	0.052
	+ 10 Years	13	2.380	0.870		
Opinion of technology utilization will increase the instrument motivation of students	1-5 Years	7	4.290	0.756		
	5-10 Years	12	4.250	0.965	0.376	0.690
	+ 10 Years	13	3.920	1.320		

According to the results of the one way variance analysis (Anova), which was applied for determining whether average points of use of metronome programs the string instrument teachers participated to the research shows a meaningful variation by period of service, the variation between group averages was found as meaningful ($F=5.054$; $p=0.013<0.05$). Complementary post-hoc analysis was carried in order to locate the origins of the variation. Metronome use points (2.250 ± 1.138) of teachers with 5-10 years period of service have been measured as higher than that (1.140 ± 0.378) of the teachers with 1-5 years period of service. Metronome use points (2.250 ± 1.138) of teachers with 5-10 years period of service have been measured as higher than that (1.380 ± 0.650) of the teacher with more than 10 years period of service.

According to the results of the one way variance analysis (Anova), which was applied for determining whether period of service variable of the string instrument teachers participated to the research shows a meaningful variation with other variables, any meaningful statistical variation was not located between group averages ($p<0.05$).

Table 6: Technology Utilization Level Averages by String Instrument

	Group	N	Mean	SD	F	p	Difference
Technology utilization level	Viola	10	3.767	0.510			
	Violin	18	2.989	0.844	3.712	**0.037**	**1 > 2**
	Others	4	3.383	0.553			
Benefiting from computers for instrument training courses	Viola	10	4.000	0.667			
	Violin	18	3.060	1.162	2.835	0.075	

	Others	4	3.250	0.957			
Benefiting from the Internet for instrument training courses	Viola	10	4.200	0.789			
	Violin	18	3.390	1.092	2.313	0.117	
	Others	4	3.750	0.500			
Benefiting from the musical note archives on the Internet for the musical pieces to be performed by students	Viola	10	4.500	0.707			
	Violin	18	3.780	0.943	2.591	0.092	
	Others	4	3.750	0.500			
Benefiting from the methods on the Internet apart from the textbooks used for instrument training courses	Viola	10	4.000	1.054			
	Violin	18	3.500	1.383	0.922	0.409	
	Others	4	4.250	0.500			
Having students listen to sound recordings of the musical pieces to be performed	Viola	10	4.500	0.527			
	Violin	18	3.890	1.183	1.563	0.227	
	Others	4	4.500	0.577			
Having students watch the videos of the musical pieces to be performed	Viola	10	4.100	1.197			
	Violin	18	3.280	1.127	3.786	**0.035**	**3 > 2**
	Others	4	4.750	0.500			
Benefiting from accompaniments available or in MIDI format for the accompaniments of musical pieces to be performed	Viola	10	2.900	1.287			
	Violin	18	1.830	1.098	2.870	0.073	
	Others	4	2.500	1.000			
Enabling students to listen to their own performances by recording their studies/pieces	Viola	10	3.200	1.476			
	Violin	18	2.440	1.247	1.133	0.336	
	Others	4	2.500	1.000			
Giving assignments to students to encourage Internet research for their instruments	Viola	10	4.300	0.675			
	Violin	18	3.560	1.247	1.439	0.254	
	Others	4	3.500	1.732			
Benefiting from the musical dictionary websites for instrument training courses	Viola	10	3.500	1.269			
	Violin	18	2.610	1.290	1.651	0.209	
	Others	4	3.000	0.816			
Benefiting from websites to teach students theories (instruments, composers, epochs etc.)	Viola	10	4.100	0.994			
	Violin	18	3.780	1.215	0.302	0.742	
	Others	4	4.000	0.000			
Using tuning programs in courses	Viola	10	3.500	1.581			
	Violin	18	1.670	1.283	5.762	**0.008**	**1 > 2** **1 > 3**
	Others	4	1.750	1.500			
Using metronome programs in courses	Viola	10	1.800	0.789			
	Violin	18	1.440	0.856	1.418	0.259	
	Others	4	2.250	1.500			
Exchanging opinions with string instrument teachers in other cities via social networks	Viola	10	3.500	1.509			
	Violin	18	2.560	1.199	1.879	0.171	
	Others	4	3.250	0.957			
Opinion of technology utilization will increase the instrument motivation of students	Viola	10	4.400	0.966			
	Violin	18	4.060	1.162	0.598	0.557	
	Others	4	3.750	0.957			

The one way variance analysis (Anova), which was applied to the data fo find out whether average points of technology utilization level of the string instrument teachers participated in the research shows a meaningful variation by string instrument variable, the variation between group averages was found as meaningful ($F=3.712$; $p=0.037<0.05$). Complementary post-hoc analysis was carried in order to locate the origins of the variation. Technology utilization points (3.767 ± 0.510) of viola teachers have been measured as higher than that (2.989 ± 0.844) of the violin teachers. According to this, it can be concluded that viola teachers follow technological developments more closely and apply them in their courses.

According to the results of the one way variance analysis (Anova), which was applied ot the data to determine whether average points of having students watch the videos of the musical pieces to be performed of the string instrument teachers participated in the research shows a meaningful variation by string instrument variable, the variation between group averages was found as meaningful ($F=3.786$; $p=0.035<0.05$). Complementary post-hoc analysis was carried out in order to locate the origins of the variation. The points of having students watch the videos of the musical pieces to be performed (4.750 ± 0.500) of violoncello and contrabass teachers have been measured as higher than that (3.280 ± 1.127) of the violin teachers.

According to the results of the one way variance analysis (Anova), which was applied to the data to determine whether average points of using tuning programs downloaded from internet in the courses of the string instrument teachers participated in the research shows a meaningful variation by string instrument variable, the variation between group averages was found as meaningful ($F=5.762$; $p=0.008<0.05$). Complementary post-hoc analysis was carried out in order to locate the origins of the variation. The points of using tuning programs downloaded from the Internet in the courses (3.500 ± 1.581) of viola teachers have been measured as higher than that (1.670 ± 1.283) of the violin teachers. The points (3.500 ± 1.581) of viola teachers have been measured as higher than that (1.750 ± 1.500) of the violoncello and contrabass teachers.

According to the results of the one way variance analysis (Anova), which was applied to the date in order to determine whether technology utilization level of string instrument teachers participated in the research as regards to string instrument variable shows a meaningful variation with other variables, any meaningful statistical variation was not located between group averages ($p<0.05$).

Table 7: Opinions of String Instrument Teachers about Technology Utilization in Instrument Training Courses

If you have any other opinions with regard to technology utilization in string instrument training, please add	
	Added Opinions
1	At the beginner level of instrument training, students can be assisted to correct dynamics such as positioning and holding, by video recording the courses.
2	Because I cannot find adequate internet content and resources, I cannot use them in my courses.
3	Turkish music has to be included in instrument training courses but resources and technological developments in this field are inadequate. For example, I experience difficulties in writing notes in programs and reflecting them. Technology is not adequately utilized in the field of Turkish music.
4	I believe technology utilization is not really necessary. I believe in learning through experience.

CONCLUSION AND RECOMMENDATIONS

Conclusion Concerning the First Sub Problem

It is understood that string instrument teachers own a personal computer and that they moderately benefit from computers in their instrument training courses.

Conclusion Concerning the Second Sub Problem

It is understood that string instrument teachers have adequate knowledge of the Internet and its use in the field of music and that they benefit from the Internet.

Conclusion Concerning the Third Sub Problem

No meaningful variation was observed between technology utilization level of string instrument teachers and gender variable.

Conclusion Concerning the Fourth Sub Problem

Metronome usage points of string instrument teachers with 5-10 years of period of service in their courses have been found as the highest. No meaningful variation was observed between other variables concerning the period of service and technology utilization level of the teachers.

Conclusion Concerning the Fifth Sub Problem

A meaningful variation was observed concerning technology utilization level of the string instrument teachers vis-à-vis to their instruments. According to this, technology utilization points of the viola teachers have been found as the highest. Furthermore, violoncello and contrabass teachers tend to have their students watch video more during their courses while viola teachers tend to benefit from tuning programs most.

Conclusion Concerning the Sixth Sub Problem

It is recommended that video camera recording can be used at the beginner level of instrument training and problems such as inadequate resources for viola training and inadequate technological development in Turkish

music were noted. One string instrument teacher has also expressed that technology is not necessary for instrument training.

Recommendation regarding the results derived from the research can be enumerated as follows:

1. String instrument teachers should assist student performances in courses or in concerts by benefiting from the existing accompaniments on the Internet or from the ones they created with the help of music software.
2. String instrument teachers should create ideal condition for students in which students can listen to their own music by recording their performances.
3. As mobile technology has become an indispensable part of daily life, string instrument teachers should benefit from supportive programs such as tuning and metronome and contribute to the individual efforts of the students by encouraging students to use these programs as well.
4. String instrument teachers should be in close communication with each other via social networks in order to maintain standards in string instrument training.
5. In order to solve resource problem in Turkish Music, websites should be designed to be used in string instrument training courses and appropriate music software should be developed for Turkish Music.
6. Music teachers of Fine Arts and Sports High Schools should be encouraged to use technology. Necessary educational and informational support should be provided by Ministry of National Education.

REFERENCES

Arapgirlioğlu, H. (2003), Music Technology and Music Education in New Century, *Music Symposium in the 80th Year of Our Republic*, Sakarya University, p.160-164, 30-31 October, Malatya.

Ayhan, A. (2012), The Importance of Educational Video Usage in Instrument Training in a World Surrounded by Social Networks, *The Journal of Academic Social Science Studies*, Volume 5, p. 171-178.

Başuğur, İ.,D. (2009), Interactive Software Usage in Music Education, *National Music Education Symposium*, Ondokuz Mayıs University, p.1-3, 23-25 September, Samsun

Demirel, Ö., Seferoğlu, S. and Yağcı, E. (2001). *Educational technologies and development of material*, Ankara: Pegem Publications.

Koç, A. (2004), *1924–2004 Symposium Manifest on Music Teacher Training since "Music Teacher Schools" to Our Day*, SDÜ, 7–10 April 2004, Isparta.

Langenberg, D.N & Spicer, D.Z (2001). *The Modern Campus. Technology Leadership Communication and Information Systems in Higher Education*, New Directions for Higher Education, No. 115 (Eds. George R. Maughan), 2001

SaY, A. (1997). *Music History*, Encyclopaedia of Music Publications, Ankara.

Tecimer, B. (2006), Internet and Life-Long Music Education, *MÜZED*, Volume: 15, p. 8-9.

Tecimer, B. (2007), Use of Technology in Piano Courses, *Journal of Orchestrate*, 387, p. 32-36.

Wilkinson, S., (1997), "*Anathomy of a home studio*", EM Boks, Emeryuille, C.A. www.muzikegitimcileri.net, Bilgin, B., *Music Teacher and Education Technology*

Supportive Learning: Linear Learning and Collaborative Learning

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ABSTRACT
This ia a conceptual paper which is trying to look at the educational technology is not limited to high technology. However, electronic educational technology, also known as e-learning, has become an important part of today's society, which consists of a wide variety of approaches to digitization, components and methods of delivery. In the literature, researchers used narrative literature review to describe the current states of both art (i.e., practice) and science (i.e., research) in focused areas of inquiry. Researchers collect all the important points of discussion, and synthesis them here with reference to the specific field where this paper is originally based on. The findings show that Computer-based training (CBT) initially delivered content via CD-ROM, and is usually presented linear content, much like reading an online book or manual. Computer supported collaborative learning (CSCL) use teaching methods that are designed to encourage or require students to engage in learning tasks. CSCL is similar in concept to the term, "collaborative learning network", "e-learning 2.0" and (NCL).

Keywords: Supportive Learning, Linear Learning, Collaborative Learning

INTRODUCTION

Educational technology is the effective use of technology tools in learning. As a concept, it involves a wide range of devices, such as media, machines and network equipment, as well as the underlying theoretical perspectives for effective application (Richey, 2008; D. Randy and Terry, 2003).

Educational technology is not limited to high technology (D. Randy Garrison and Terry Anderson, 2003). However, electronic educational technology, also known as e-learning, has become an important part of today's society, which consists of a wide variety of approaches to digitization, components and delivery methods (Selwyn, 2011). For example, m-learning emphasizes movement, but otherwise indistinguishable in principle from educational technology (Moore, Dickson-Deane, Galyen, 2011).

Educational technology includes a wide range of media that delivers text, audio, images, animation and video streaming, and includes applications such as technology and process audio or video tape, satellite TV, CD-ROM, and computer-based learning, as well as local intranet / extranet and web-based learning. Information and communication systems, either alone or by either the local network or the Internet in the learning network, underlies much of the e-learning (Tavangarian, Leypold, Nolting, Roser, 2004).

Theoretical perspectives and scientific testing affect instructional design. Use theories of human behavior to derive the input of technology education teaching theory, learning theory, educational psychology, media psychology and human performance technology.

Educational technology and e-learning can take place inside or outside the classroom. It can be self-directed, asynchronous learning or instructor-led it, synchronous learning. It is ideal for distance learning and, together with face-to-face learning, called blended learning. Educational technology is used by students and educators in homes, schools (both K-12 and higher education), business, and other settings.

METHOD

Researchers collect all the important points of discussion, and synthesis them here with reference to the specific field where this paper is originally based on.

LINEAR LEARNING

Computer-based training (CBT) refers to independent learning activities are sent to a computer or handheld device such as a tablet or smartphone. CBT content initially delivered via CD-ROM, and is usually presented linear content, much like reading an online book or manual. For this reason, CBT is often used to teach static processes, such as using software or completing mathematical equations. Computer-based training is a concept similar to the web-based training (WBT) sent over the Internet using a web browser.

Assessing learning in a CBT frequently by assessments that can be easily scored by a computer such as multiple-choice questions, drag-and-drop, radio button, simulation or other interactive means. Rating easily scored and recorded via online software, providing immediate feedback to end users and ready status. Users are often able to print completion records in the form of a certificate.

CBTs stimulate learning outside traditional learning methodology from textbook, manual, or classroom-based instruction. CBTs can be a good alternative for learning materials printed since rich media, including videos or animations, can be embedded to enhance the learning process.

However, CBTs pose some learning challenges. Usually, the creation of effective CBTs requires substantial resources. The software for developing CBTs (such as Flash or Adobe Director) is more complex than a subject matter expert or teacher can use. The lack of human interaction can limit both the type of content that can be presented and type of assessment can be done, and may need to supplement with online discussion or other interactive elements.

The computer is a general purpose tool that can be programmed to carry out a set of arithmetic or logic operations automatically. Because the order of operations can be easily changed, the computer can solve more than one problem.

Conventionally, the computer comprises at least one processing element, typically a central processing unit (CPU), and some forms of memory. Processing elements perform arithmetic and logical operations and sequencing and control unit can change the order of operations in response to the information stored. Peripheral devices allow information to be retrieved from an external source, and results of operations are stored and retrieved.

Mechanical analog computer began to appear in the first century and was used in medieval era for astronomical calculations. In World War II, a mechanical analog computer was used for special military applications such as counting torpedo target. At this time the first electronic digital computer was developed. Originally they were the size of a large room, consuming as much power as several hundred modern personal computers (PC) (Fuegi, and Francis, (2003).

Modern computers based on integrated circuits are millions to billions of times more capable than the earliest computer, and occupies a fraction of the space (Kempf, 1961). Computer is small enough to fit in your mobile device, and mobile computers can be powered by a small battery. Personal computers in various forms are icons of the Information Age and is generally regarded as "computer". However, the embedded computers found in many devices from MP3 players to fighter aircraft and from electronic toys to industrial robots are the most numerous.

The Internet is a global system of interconnected computer networks that use Internet protocol suite (TCP/IP) to connect billions of devices worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks of local to global scope, which is associated with a broad array of electronic, wireless and optical networking technologies. Internet brings a wide range of information resources and services, such as documents concerning the application of hypertext and the World Wide Web (WWW), e-mail, phone, and peer-to-peer network to share files.

Although Internet protocol suite has been widely used by academics and the military industrial complex since the early 1980s, the events of the late 1980s and 1990s as more powerful computers and more affordable, the arrival of the optical fiber, the popularization of HTTP and Web browsers and a push towards open technologies for trading services and technology ultimately incorporated into almost every aspect of contemporary life.

The origins of the Internet dates back to the research and development carried out by the United States, United Kingdom and France in 1960 to build robust, fault-tolerant communication via computer networks (IPTO, 2000). The work, led to a major pioneer network, ARPANET, the United States, Mark 1 network coverage in the United Kingdom and the Cyclades in France. The connection of regional academic network in 1980 marked the beginning of the transition to the modern Internet (Ian, 2014). From 1980 onwards, the network experienced exponential growth as the generation of maintaining institutional, personal, and portable computer is connected to.

Internet usage is growing rapidly in the West from the mid-1990s and the late 1990s in developing countries. In the 20 years since 1995, Internet use has grown 100 times, measured for a period of one year, more than one third of the world population (World Stats, 2012).

Most traditional communications media, such as telephone and television, are reshaped or redefined by the Internet, the birth of new services such as mobile Internet and Internet television. Newspapers, books, and other printed publications adapting to Web site technology, or are reshaped into blogging and web feeds. The entertainment industry was initially the fastest growing segments on the Internet. Internet has enabled and accelerated new forms of personal interaction through instant messaging, Internet forums, and social networks. Shopping online has grown tremendously for both major retailers and small traders and artisans. Business-to-business financial services in the Internet affect supply chains across entire industries.

Internet has no centralized governance in either implementation or policies for access and use of technology; each constituent network sets its own policies (Strickland, 2014). Only the overreaching definitions of the two principal name spaces in the Internet, the Internet Protocol address space and the Domain Name System (DNS), directed by the organization, the Internet Corporation for Assigned Names and Numbers (ICANN). Which is the basis of technical and standardization of the core protocols of the Internet Engineering Task Force (IETF), a non-profit organization loosely affiliated international participants that anyone may associate with by contributing technical expertise (Hoffman and Harris, 2006).

WORLD WIDE WEB

Many people use the terms Internet and World Wide Web, or simply Web, interchangeably, but the two terms are not synonymous. World Wide Web is the main application that billions of people use the Internet, and it has changed the lives of those who are far (Pew Research Center, 2015). However, the Internet provides many other services. Web is a global set of documents, images and other resources, logically interrelated by hyperlinks and referenced with a Uniform Resource Identifier (URI). URI symbolically identify services, servers and other databases, and documents and resources that they can provide. Hypertext Transfer Protocol (HTTP) is the main access protocol of the World Wide Web. Web services also use HTTP to allow software systems to communicate in order to share and exchange business logic and data.

World Wide Web browser software, such as Microsoft Internet Explorer, Mozilla Firefox, Opera, Apple Safari and Google Chrome, let users navigate from one site to another via hyperlinks embedded in the document. These documents may also contain any combination of computer data, including graphics, sound, text, video, multimedia and interactive content that runs while the user interacts with the page. The client software can include animation, games, office applications and scientific demonstrations. Through a search engine keyword-driven Internet research using as Yahoo! and Google, users worldwide have easy, instant access to a huge amount and variety of information online. Compared to print media, books, encyclopedias and traditional libraries, the World Wide Web has enabled the distribution of information on a large scale.

The Web has also enabled individuals and organizations to publish ideas and information to a potentially large audience online with reduced expense and time delays. Publishing web site, blog, or building a website involves little initial cost and many of the services are provided. However, publishing and maintaining large, professional web sites with attractive, diverse and up-to-date information is still a difficult and expensive proposition. Many individuals and some companies and groups use web logs or blogs, which are largely used as online diaries easily updatable. Some commercial organizations encourage staff to communicate advice in their area of specialization in the hope that visitors will be impressed by the expert knowledge and free information, and attracted to the corporation as a result.

One example of this practice is Microsoft, whose product developers publish their personal blogs in order to attract people to their work. [Original research?] The collection of personal web pages published by large service providers remain popular and have become increasingly sophisticated. Whereas operations such as Angelfire and GeoCities have existed since the early days of the Web, newer offerings from, for example, Facebook and

Twitter now has a large number of followers. These operations often brand themselves as social network service and not only as a host site.

Advertising on popular web pages can be lucrative, and e-commerce or sale of products and services directly through the site continues to grow.

If the site developed in the 1990s, the site regularly kept in the form completed by the web server, are formatted in HTML, complete to be sent to the web browser in response to the request. Over time, the process of creating and serving web pages has become a dynamic, creating a flexible design, layout, and content. Websites are often created using content management software with, initially, very little content. Contributors to this system, which can be paid staff, members of the organization or the public, fill underlying databases with content using editing pages designed for that purpose, while visitors view and read this content in the form of HTML. There may or may not be editorial, approval and security systems built into the process of taking a new content in and make it available to the target visitors.

COMMUNICATION

E-mail is an important communications service available on the Internet. The concept of sending electronic text messages between parties in the same way with the letter of correspondence or memos predates the creation of the Internet. Pictures, documents, and other files sent as e-mail attachments. E-mails can be cc-ed to multiple email addresses.

Internet telephony is another common communications service made by the creation of the Internet. VoIP stands for Voice-over-Internet Protocol (VoIP), referring to the protocol that underlies all Internet communication. The idea began in the early 1990s with walkie-talkie voice applications such as personal computers. In recent years, many VoIP systems have become as easy to use and as easy as a regular phone. The benefit is that, as the Internet carries voice traffic, VoIP can be free or much cheaper than traditional phone calls, especially over long distances and especially for those who always have an Internet connection such as cable or ADSL. VoIP matured into a competitive alternative to traditional telephone services. Interoperability between different providers has improved and the ability to call or receive calls from traditional phone available. Simple, inexpensive VoIP network adapters are available that eliminate the need for a personal computer.

Voice quality can still vary from call to call but is often equal to and can even exceed that of traditional calls. Remaining problems for VoIP include emergency telephone number dialing and reliability. At present, some VoIP providers provide an emergency service, but it is not universal. Old traditional phones with no "extra features" might just power line and operate during a power failure; VoIP cannot do so without a backup power source for the phone equipment and Internet access devices. VoIP has also become increasingly popular for gaming applications, as a form of communication between players. Popular VoIP clients for gaming include Ventrilo and TeamSpeak. Modern video game consoles also offer VoIP chat features.

DATA TRANSFER

File sharing is an example of transferring large amounts of data on the Internet. Computer files can be emailed to clients, colleagues and friends as an attachment. It can be uploaded to a website or file transfer protocol (FTP) server for easy download by others. It can be put into a "shared location" or onto a file server for instant use by colleagues. Load download bulk to many users can be eased by using a "mirror" servers or peer-to-peer network. In any of these cases, access to files that can be controlled by user authentication, transit files over the Internet can be obscured by encryption, and money may change hands for access to the file. The price may be paid by charging much funds from, for example, a credit card whose details are also passed - usually fully encrypted - on the Internet. The origin and authenticity of the file received may be checked by digital signatures or MD5 or other message digests. This feature is easy to Internet, more globally, changing the production, sale, and distribution of anything that can be reduced to a computer file for transmission. This includes all forms of print publications, software products, news, music, film, video, photography, graphics and other art. This in turn has led to seismic changes in the existing industries that previously controlled the production and distribution of these products.

Streaming media is the delivery of real-time digital media for immediate use or enjoyment by the end user. Many radio and television broadcasters provide Internet audio and video feeds of their lives. They may also allow time-shift viewing or listening such as Preview, Classic Clips and Listen Again features. Providers have been accompanied by a variety of pure Internet "broadcasters" who never had a license into the air. This means that the device connected to the Internet, such as a computer or something more specific, can be used to access online media in much the same way as previously possible only with a television or radio receiver. A wide range of

existing content is wider, from specialized technical webcasts to on-demand popular multimedia services. Podcasting is a variation on this theme, in which - usually audio - material is downloaded and played back on a computer or shifted to a portable media player to hear the motion. These techniques using simple equipment allow anybody, with little censorship or licensing control, to broadcast audio-visual material worldwide.
Model live media increase the demand for network bandwidth. For example, the image quality standard requires 1 Mbit / s link speeds for SD 480p, 720p HD quality requires 2.5 Mbit / s, and the quality HDX top-of-the-line requires 4.5 Mbit / s for 1080p (Morrison, 2010).

Webcam is a continued low cost of this phenomenon. While some webcams can give full-frame-rate video, the picture is usually either small or updates slowly. Internet users can watch animals around an African waterhole, ships in the Panama Canal, traffic at a local roundabout or monitor their own premises, live and in real time. Video chat rooms and video conferencing are also popular with many uses being found for personal webcams, with and without two-way sound. YouTube was founded on 15 February 2005 and is now leading website for free streaming video with a large number of users. It uses a flash-based web player to stream and show video files. Registered users can upload unlimited videos and build their own personal profile. YouTube claims that its users watch hundreds of millions, and upload hundreds of thousands of videos daily. At this time, YouTube also uses HTML5 player (YouTube Fact Sheet, 2009).

Web browser (usually referred to as a browser) is a software application for retrieving, presenting, and traversing information resources on the World Wide Web. Resource information identified by Resource Identifier (URI/URL) uniform and can be web pages, images, video or other piece of content (Jacobs & Walsh, 2004). Hyperlinks in resources that allow users to easily navigate their browsers to related resources.

Although browsers are primarily intended to use the World Wide Web, they also can be used to access information provided by Web servers in private networks or files in the file system.

The major web browsers are Firefox, Internet Explorer / Microsoft Edge (Fitzpatrick, 2009), Google Chrome, Opera, and Safari.

FUNCTION
The main purpose of a web browser is to bring information resources to users ("recover" or "fetching"), which allows them to view information ("Display", "give"), and then access other information ("cruise", " The following links").

The process starts when a user inputs a Uniform Resource Locator (URL), for example http://en.wikipedia.org/, into the browser. URL prefix, the Uniform Resource Identifier or URI, specifying how it will be interpreted. The most commonly used type of URI starts with http: and identifies a resource to be taken on the Hypertext Transfer Protocol (HTTP) (Browser Information, 2012). Many browsers also support a variety of other prefixes, such as https .: for HTTPS, ftp : for File Transfer Protocol, and files: local files. Prefix that web browsers can not directly handle are often handed off to another application entirely. For example, mailto: URI usually left to the default e-mail application users, and news: URIs passed to the default newsgroup reader users.

In the case of http, https, file, and others, when the resource is taken web browser will display it. HTML and related content (images, files, format information such as CSS, etc.) approved for browser layout engine to change from markup to an interactive document, a process known as "performances". Aside from HTML, web browsers can generally display any kind of content that can be part of the site. Most browsers can display images, audio, video, and XML files, and often have plug-in to support Flash applications and Java applets. When encountering unsupported file types or files are set to be downloaded from the display, the browser prompts the user to save the file to disk.

Sources of information may contain links to other information sources. Each link contains the URI of the resource to go to. When the link is clicked, the browser navigate to the source indicated by the link target URI, and the process of bringing content to the user begins again.

FEATURES
Web browsers are available in a wide range of features from minimal, text-based user interface with a bare-bones support for HTML to rich user interface that supports a variety of file formats and protocols. Browsers include additional components to support e-mail, Usenet news and Internet Relay Chat (IRC), sometimes referred to as the "Internet suite" rather than mere "web browser" (Mozilla Foundation, 2008).

All major web browsers allow the user to open multiple information resources simultaneously, either in a different browser window or tab different the same window. Major browsers also include pop-up blockers to prevent unwanted windows from "popping up" without the user's consent (Andersen & Abella, 2004).

Most web browsers can display a list of sites that the user has bookmarked so that users can quickly return to them. Bookmarks are also known as "Favorites" in Internet Explorer. In addition, all major web browsers have some form of built-in web feed aggregator. In Firefox, formatted web feeds as "live bookmarks" and behave like a bookmark folder that corresponds to the recent inclusion in food (Bokma, 2009). In the opera, the more traditional feed readers include a store and display content feeds (Opera Software, 2009).

Furthermore, the browser can be extended via plug-in, download the components that provide additional features.

COLLABORATIVE LEARNING

Computer supported collaborative learning (CSCL) use teaching methods that are designed to encourage or require students to engage in learning tasks. CSCL is similar in concept to the term, "e-learning 2.0" and "learning network" (NCL) (Trentin, 2010).

Collaborative learning is distinguished from traditional approaches to instruction in which teachers are the primary source of knowledge and skills. For example, the new "e-learning 1.0" refers to the direct transfer method in learning and computer-based training (CAL). In contrast to the linear transmission of content, often directly from the instructor, CSCL using blogs, wikis, and cloud-based document portal (such as Google Docs and Dropbox). With the introduction of Web 2.0 technologies, the sharing of information between multiple people in a network that has become easier and consumption have increased (Crane, 2009). One of the main reasons for its use states that it is "a breeding ground for creative and compelling business education (Crane, 2009)".

Using Web 2.0 social tools in the classroom allows students and teachers to work together, discuss ideas, and promote the information. According to Sendall (2008), blog, wiki, and social skills are found to be significantly useful in the classroom. After an initial briefing on the use of tools, the students reported increases in knowledge and comfort level for using Web 2.0. Collaboration tools provide students with technology skills needed in today's workforce.

Locus of control remains an important consideration in the success of e-student involvement. According to the work of Cassandra B. Whyte, constant attention to aspects of motivation and success with respect to e-learning should be kept in context and together with the efforts of other education. Information about the tendency of motivation can help educators, psychologists, and technologists develop insights to help students perform better academically (Whyte & Lauridsen, 1980).

Another type of instrument is a collaboration application that allows students and teachers to interact while learning. One example is MathChat, which allows problem-solving and cooperative response to feedback (MathChat, 2015). Some applications may also provide an opportunity to revise or learn new topics independently in a classroom simulation. One popular example is the Khan Academy Khan Academy, 2015), which offers materials in mathematics, biology, chemistry, economics, art history and many others. It has the advantage of combining learning styles as the app offers more videos for visual and auditory learners, as well as training and tasks to complete for kinesthetic learners. Other applications designed after the game, providing a fun way to check. When the experience is fun the students become more involved. The game also usually come with a sense of development, which can help keep students motivated and consistent when trying to improve. Examples of educational games is Dragon Box, Mind Snacks, Code spells and more (News.uci.edu., 2015).

CLASS 2.0

Classroom 2.0 refers to various online user virtual environments (mauves) connecting schools in geographic boundaries. Known as "eTwinning", computer-supported collaborative learning (CSCL) allow students in the school to communicate with students in another that they would not get to know otherwise (Scuola-digitale.it., 2013), to improve educational outcomes [citation needed] and cultural integration. Examples of classes application is 2,0 Blogger and Skype (Pumila, 2012).

E-LEARNING 2.0

E-learning 2.0 is a kind of collaborative learning (CSCL), which supported the computer system developed by the emergence of Web 2.0 (Karrer, 2007). From the perspective 2.0 e-learning, e-learning system is based on

conventional teaching package, which is delivered to students using assignments. Tasks that have been evaluated by the teacher. On the other hand, places the new e-learning increased emphasis on social learning and the use of social software such as blogs, wikis, podcasts and virtual worlds such as Second Life (Redecker, 2009). This phenomenon has been referred to as the Long Tail Learning.

E-learning 2.0, in contrast to e-learning systems not based on CSCL, assumes that knowledge (as meaning and understanding) is socially constructed. Learning takes place through conversations about content and interaction depth of the problem and action. Proponents of social learning claim that one of the best ways to learn something is to teach it to others (Brown & Adler, (2008).

In addition to virtual classroom environments, social networks have become an important part of the E-learning 2.0. Social networks have been used to foster online learning communities around subjects as diverse as test preparation and language education (Manprit, 2011). Mobile Assisted Language Learning (MALL) is the use of handheld computers or cell phones to assist in language learning. Traditional educators may discourage social networking unless they are communicating with their friends own (Crane, 2009).

Virtual Learning Environments (VLEs) and Personal Learning Environments (ples) provides an easy to use system to deliver flexible learning materials, activities and support to students in all institutions. Administrators, a VLE provides a set of tools that allow students to course content and will be managed efficiently and provide a single point of integration with student records system (Mohammed, 2009).

MEDIA

Media education and tools that can be used to:

- Support the restructuring tasks: help with how to perform tasks (procedures and processes),
- Access to the knowledge base (help users find the required information)
- alternative forms of knowledge representation (knowledge representation, eg video, audio, text, images, data)

Various types of physical technology is being used (Forehand, 2010): digital cameras, video cameras, interactive whiteboard tools, document cameras, electronic media, and LCD projectors. The combination of these techniques include blogs, collaborative software, ePortfolios, and virtual classrooms.

AUDIO AND VIDEO

Radio provides a vehicle synchronous education, while streaming audio via the internet with a webcast and podcast are asynchronous. Grade microphones, often wireless, can enable students and teachers to interact more clearly.

Video technology (Decker, Lane, O'Brien, & Kyger 2009) have entered VHS tape and DVD, as well as on-demand and simultaneous methods with digital video through a web-based server or as streaming video from YouTube, Teacher Tube, Skype, Adobe Connect, and web cameras. Telecommuting can be connected to speakers and other experts. Interactive digital video games used in higher education institutions (Biocchi 2011) and K-12.

COMPUTER, TABLET AND MOBILE DEVICES

Collaborative learning is a group-based learning approach where students engage with in order to achieve the goal of learning or solve learning tasks. With recent developments in smartphone technology, processing power and storage capacity of a modern mobile phone allows for more rapid development and use of applications. Many application developers and educational experts have been exploring the smartphone and tablet apps as a medium for collaborative learning.

Tablet computers and allows students and educators to access websites and programs such as Microsoft Word, PowerPoint, PDF files, and images. Many mobile devices support m-learning.
Mobile devices such as clickers and smart phones can be used for interactive audience response feedback. Mobile learning can provide performance support to check the time, set reminders, get the worksheet, and instruction manual (Terras & Ramsay, 2012).

Open Course Ware (OCW) provides free public access to information used in the programs of undergraduate and graduate. Institutions that participated were MIT (Kiyoshi & Kumar, 2008) and Harvard, Princeton, Stanford, the University of Pennsylvania and the University of Michigan (Lewin, 2012).

CONCLUSION

The supportive learning environment can support and encourage individuals to confirm attendance and participation. Linear students learn the most thorough and efficient, while the material presented to them in a logical, ordered progress. The power of collaboration to promote student learning to approach each other to solve problems and share knowledge not only build collaboration skills but lead to learning and better understanding. E-learning may be either synchronous or asynchronous. Synchronous Learning occurs in real time, with all participants interacting at the same time, while asynchronous learning is self and allow participants to engage in an exchange of ideas or information without the dependency of other participants involvement at the same time. The extent to which the e-learning or replace other learning and teaching approaches are different, ranging on a continuum from none to online distance learning entirely. Various descriptive terms used (somewhat inconsistently) to categorize the extent of the technology used. For example, the 'hybrid learning' or 'blended learning' can refer to aid classroom and laptops, or can refer to an approach in which traditional classroom time is reduced but not eliminated, and replaced with some online learning. 'Distributed Learning' can explain whether the e-learning component of a hybrid approach, or fully online distance learning environment. On the other hand, the convergence of media technology is the result of a long process of adjusting their communication resource for the history of evolutionary change every second.

REFERENCES

Andersen, S. & Abella, V. (2004). Part 5: Enhanced Browsing Security. *Changes to Functionality in Microsoft Windows XP Service Pack 2*. United States: Microsoft

Biocchi, M. (2011). Games in the classroom. *Gaming in the classroom*. Retrieved Jan 26, 2016 from http://educationtech.ca/2011/03/24/games-in-the-classroom

Bokma, J. (2009). *Mozilla Firefox: RSS and Live Bookmarks*. USA: Mozilla

Brown, J. & Adler, R. P. (2008). Minds on Fire:Open Education, the Long Tail, and Learning 2.0. *Educause review (January/February 2008),(*pp. 16–32).

Browser Information . (2012). *Browser Information.* New Jersy: Digital Beam Forming

Crane, B. E. (2009). *Using Web 2.0 Tools in the k-12 Classroom*. Chicago: Neal-Shuman Publishers Inc., (pp. 3).

D. Randy, G &Terry, A. (2003). Definitions and Terminology Committee . *E-Learning in the 21st Century: A Framework for Research and Practice.* UK: Routledge.

Diecker, L., Lane, A., O'Brien, B. & Kyger, F. (2009). Evaluating Video Models of Evidence-Based Instructional Practices to Enhance Teacher Learning. *Teacher Education and Special Education 32 (2), (pp. 180–196)*

Fitzpatrick, J. (2009). *Five Best Web Browsers. Lifehacker.* New York: Gawker Media.

Forehand, M. (2010). *Bloom's Taxonomy. From Emerging Perspectives on Learning, Teaching and Technology.* Georgia: University of Georgia.

Fuegi, J. & Francis, J. (2003). Lovelace & Babbage and the creation of the 1843 notes. IEEE Annals of the History of Computing 25 No. 4 (October–December 2003), *Digital Object Identifier.*

Hoffman, P. & Harris, S. (2006). *The Tao of IETF: A Novice's Guide to Internet Engineering Task Force*. Chicago: RFC4677.

Ian, P. (2014) *So, who really did invent the Internet?, The Internet History Project, 2004.* USA: Net History

Iiyoshi, T. & Kumar, M. S. (2008). *Opening up education: the collective advancement of education through open technology, open content, and open knowledge*. Cambridge: Mass MIT Press.

IPTO. (2000). IPTO Information Processing Techniques Office. *The Living Internet, Bill Stewart (ed).*

Jacobs, I. & Walsh, N. (2004). URI/Resource Relationships. *Architecture of the Architecture of the World Wide Web, Volume One.*

Karrer, T (2007). *Understanding eLearning 2.0.* UK: Learning circuit

Kempf, K. (1961). *Historical Monograph: Electronic Computers Within the Ordnance Corps*. USA: Aberdeen Proving Ground (United States Army).

Khan Academy . (2015). *Khan Academy: learn math, biology, chemistry, economics, art history and almost anything for free on the App Store*. India: App Store.

Manprit Kaur (2011). *Using Online Forums in Language Learning and Education*. Bristol: StudentPulse.com.

MathChat. (2015). *Join the Math Homework Help Community on the App Store*. India: App Store.

Mohammed Al-Zoube .(2009). *E-Learning on the Cloud* . Jordan: Princess Sumaya University for Technology

Moore, J. L., Dickson, D. C. & Galyen, K. (2011). E-Learning, online learning, and distance learning environments: Are they the same?. *The Internet and Higher Education 14 (2), (pp. 129–135).*

Morrison, G. (2010). *What to know before buying a 'connected' TV – Technology & science – Tech and gadgets – Tech Holiday Guide*. USA: Holiday Tech Guide.

Mozilla Foundation. (2008). *The SeaMonkey Project.* Australia: SeaMonkey

News.uci.edu. (2015). UCI's iMedEd Initiative named a 2012-13 Apple Distinguished Program. USA: UCI EDU

Opera Software. (2009). RSS newsfeeds in Opera Mail. Norway: Opera Software ASA

Pews Research Center. (2014). *World Wide Web Timeline*. USA: Pews Research Center
Pumilia, G. P. (2012). *Didactic Strategies and Technologies for Education: Incorporating Advancements.* UK:IGI Global
Redecker, Christine (2009). Review of Learning 2.0 Practices: Study on the Impact of Web 2.0 Innovations on Education and Training in Europe. *JRC Scientific and technical report. (EUR 23664 EN – 2009).*
Richey, R.C. (2008). Reflections on the 2008 AECT Definitions of the Field. *Scuola-digitale.it. TechTrends 52 (1), (pp. 24–25).*
Selwyn, N. (2011). *Education and Technology: Key Issues and Debates.* London: Continuum International Publishing Group.
Sendall, P., Ceccucci, W. & Peslak, A. (2008). Web 2.0 Matters: An Analysis of Implementing Web 2.0 in the Classroom. *Information Systems Education Journal 6 (64).*
Strickland, J. (2014). *Who owns the Internet?* USA: How Stuff Works Tech.

Tavangarian D., Leypold, M., Nölting, K. & Roser M. (2004). Is e-learning the Solution for Individual Learning? *Journal of e-learning.*
Terras, M. & Ramsay. (2012). The five central psychological challenges facing effective mobile learning. *British Journal of Educational Technology 43 (5), (pp. 820–832).*
Trentin G. (2010). *Networked Collaborative Learning: Social Interaction And Active Learning.* Cambridge: Woodhead Publishing Limited.
YouTube Fact Sheet. (2010). *YouTube Fact Sheet.* California: YouTube, LLC.
Whyte, C. B. & Lauridsen, K. (1980). An Integrated Learning Assistance Center. New Directions Sourcebook, Jossey-Bass, Inc. *World Wide Web, Volume One.* USA: World Wide Web Consortium.
World Stats. (2012). World Stats. *Internet World Stats.* USA: Miniwatts Marketing Group.

The Effect of Blended Learning and Social Media-Supported Learning on the Students' Attitude and Self-Directed Learning Skills in Science Education

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ABSTRACT
The main purpose of this study is to investigate the effect of blended learning and social media supported learning on the students' attitude and self-directed learning skills in Science Education. This research took place with the 7th grade 74 students attending to a primary school in Kadikoy, Istanbul and carried out "Our Body Systems" unit at 2011-2012 Academic Year. The design of the study was pretest–posttest control group design. Control Group is taught by using the traditional face to face approach with the 5E learning cycle, one of the experimental groups received blended learning model (face to face and internet based learning) with the 5E learning cycle and the other experimental group received social networking supported based on face to face approach and the 5E learning cycle model. Data were collected using the Science Teaching Attitude Scale and the Self-directed Learning Skills Scale. Quantitative data were analyzed by One-Way Anova, t-Tests and Kolmogorov Smirnov-Z Test of SPSS 17 Statistic Program. As a result, while blended learning experimental group increase science attitude and self-directed learning skills significantly than the control group; social media supported learning group has a positive impact on attitude and self-directed learning skills, although this change didn't make a significant difference compared with the control group.

Keywords: Blended learning, social media supported learning, social media, science education

INTRODUCTION
The use of computers, one of the key elements of the information era we are in, and the internet that has been developing in a meteoric pace since the 90s continue to become widespread in the world rapidly. This proliferation transforms societies as well. In conjunction with the rapid development of technology we have also been experiencing significant developments in the area of education in recent years. The education system needs to reflect the changes in all the sub-systems of the society in its structure as fast as possible and thus, it is in the struggle of using the technologies based on computers and the internet widely and effectively (Garrison & Kanuka, 2004).

Technology that has become an integral part of life now impacts education positively and brings along a number of opportunities. Learning – teaching approaches are changing and science education receives its share from these improvements. In the 21st century, the internet is being used in every area, particularly in the area of education frequently. Thus, it has become a requirement that, rather than using a single learning approach, multiple learning approaches are implemented in a blended way and also that the internet, portals providing content related to education and the social media are made use of effectively. This requirement poses the learning model of blended learning and the social media-supported learning model.

As technology and the internet developed, the convenience for access to information has increased superiorly and this has brought into question the probability that the significance of face-to-face learning environments will decrease over time. Thereupon, researchers have designed electronic learning environments and some universities and institutions have even applied programs to realize their education by electronic learning solely and have researched the issue whether this probability would come true (Driscoll, 2002; Singh, 2003; Osguthorpe & Graham, 2003). Electronic learning has become widespread gradually and it is being used along with the face-to-face learning model. Thus, blended learning has emerged as a learning model.

A review of the literature provides us with various definitions regarding blending learning. In international literature the model is referred to as blended learning, mixed learning and hybrid learning and in national

literature it is referred to as blended or mixed learning. In the model the favorable aspects of face-to-face learning and web-based learning are used and various methods and techniques are combined (Singh & Reed, 2001; Driscoll, 2002; Garnham & Kaleta, 2002; Graham, Allen & Ure, 2003; Osguthorpe & Graham, 2003; Wilson & Smilanich, 2005; Graham, 2006; Uluyol ve Karadeniz, 2008).

While the blended learning environment offers a number of strong aspects to the learners such as being able to study at desired places and desired times for desired periods and also to receive immediate feedback/correction/reinforcement through a web-based learning environment, it also offers other strong aspects such as discussions in the face-to-face learning environment, having direct interaction and communication with the teacher and learners, the learners are being able to see and review each other's learning products.

A number of researchers have mentioned the advantages of blended learning. These advantages are; i) providing flexibility and convenience in the learning environment ii) increase in the learning level and achievement, iii) increase in the permanence of knowledge, iv) increase in the interest in learning, v) increase in the motivation in the course, vi) interaction and vii) cost efficiency (Singh and Reed, 2001; Garnham & Kaleta, 2002; Young, 2002; Carman, 2002; Collis, 2003; Osguthorpe & Graham, 2003; Rovai & Jordan, 2004; Sancho, Corral, Rivas, Gonza´lez, Chordi & Tejedor, 2006; Cavalli, Gnudi, Iovino, Lorenzi & Malvisi, 2007; Lilje & Peat, 2007; Akın, 2007; Orhan, 2007; Altun, Gülbahar ve Madran, 2008; Finch, 2008; Karaman, Özen, Yıldırım ve Kaban, 2009; Uluyol ve Karadeniz, 2009; Uzun ve Şentürk, 2010).

In this century as the information technologies have been developing, in addition to social, cultural and economic life, learning and teaching processes have also been refashioned. As the technologies called Web 2.0 emerged after 2005 providing the opportunity for communication and interaction between the users and enabling sharing of videos and pictures, social media sites such as Facebook, Youtube etc. have been established. An overwhelming change was experienced in many social network sites and their popularities grew. In addition, the time the users spend in social networks, where numerous people from different age groups subscribe, has shown a substantial increase during the time between today and the emergence of the social networks (Gülbahar, Kalelioğlu ve Madran, 2010).

Social network sites are web-based services that allow individuals to construct a public or semi-public profile within a system bounded with rules, to view the lists of other users they are in connection with, to view and traverse their list of connections in the system (Boyd & Ellison, 2008). Social media is usually used for communication, socializing, friendship and sharing. However, recently using the social media technologies in education has also become an issue.

Social media sites are flexible and user-friendly. Therefore, compared to other learning management systems, they are used more easily. A number of educators and researchers can generate a community with simple steps, can share many things between each other and can communicate with each other. All these aspects provide facilities for the users. Social media sites can enrich education by providing blended learning experiences and they can provide benefits for educational institutions supporting the teaching and assessment processes (Jones, Blackey, Fitzgibbon & Chew, 2010).

It is believed that the significance of blended and social media supported learning will increase gradually. Therefore, it is of vital importance that research for both blended learning and also the social media is carried out with regard to a number of factors.

In the light of all these developments, the aim of this study is to examine the impact of blended and social media-supported learning on the self-directed learning skills and attitudes of the learners in science education experimentally.

The hypotheses that have been developed in line with the aims of the study have been listed below:
1- "Is there a meaningful difference between the attitudes of the students in the primary 7th grade science and technology lesson regarding the science course, for whom blended learning, social media supported learning and face-to-face learning were applied?"
2- "Is there a meaningful difference between the self-directed learning skills of the students in the primary 7th grade science and technology lesson, for whom blended learning, social media supported learning and face-to-face learning were applied?"

THE STUDY
In this study, that aims to examine the impact of blended learning and social media-supported learning on the

self-directed learning skills of the students and their attitudes regarding the science course in science education, an experimental design with pre-test-posttest control group has been used. Experimental designs are research designs at which data to be observed is produced under the control of the researcher in order to attempt to identify the cause and effect relationships (Karasar, 2005).

In this study quantitative data has been collected and analyzed. Quantitative researches attempt to justify the relations between the variables, searching for the reasons for these relations and explaining them. In quantitative research the researchers generate the general formation of the widely agreed stages that will guide them and it is expected that the model has been specified in advance (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz ve Demirel, 2009). The design of the research used in the study is displayed in Table 1.

Table 1 Research design

	Learning model	Pre-tests	Post-tests
Control Group	Face to face learning	SAS,SDLSS	SAS,SDLSS
Experimental Group-1	Blended learning	SAS,SDLSS	SAS,SDLSS
Experimental Group-2	Social media-supported learning	SAS,SDLSS	SAS,SDLSS

SDLSS: Self-directed learning skills scale, SAS: Science attitude scale

As is displayed in Table 1, control and experimental groups were formed and face-to-face learning was applied in the control group, blended learning was applied in experimental group-1 and social media supported learning was applied in experimental group-2.

Study group

The study group of the study comprises a total of 74 students in the 7th grade of a public school in the academic year 20111 – 2012 in Istanbul city, Kadıköy district. The groups were selected randomly and their distribution is displayed in Table 2.

Table 2 Gender distribution of the control and experimental groups

Gender	Control Group	Experimental Group-1	Experimental Group-2	Total
Female	13	15	14	42
Male	11	10	11	32
Total	24	25	25	74

According to Table 2, 42 of 74 students are girls and 32 are boys.

Data collecting tools

The following quantitative data collecting tools have been used to collect data:

1. Science attitude scale (SAS): The "Science Attitude Scale" used in the study was developed by Akınoğlu (2001) and its reliability coefficient (Cronbach Alfa) was specified as 0.89. In the attitude scale there are 20 judgment-related negative and positive statements regarding the attitudes of the students towards science classes. The scale comprising of expressions specifying whether the students like science classes and whether they enjoy activities related to this lesson is a 5-point likert scale. In this study the reliability coefficient of the scale (Cronbach Alfa) has been calculated as 0.85.

2. Self-Directed Learning Skills Scale (SDLSS): The "Self-Directed Learning Skills Scale" used in the study was developed by Aydede and Kesercioğlu (2009).

In this scale there are 25 judgment-related negative and positive statements regarding the self-directed learning skills of the students in science classes. The scale is a 5-point likert scale. It was given to 446 primary students and the reliability coefficient for the whole scale (Cronbach Alpha) was found 0.86 (Aydede and Kesercioğlu,

2009, p.53). In this study the reliability coefficient of the scale (Cronbach Alfa) was calculated as 0.79.

Implementation

The practices during this study were carried on for 32 hours (8 weeks). SAS and SDLSS were given to all groups in the school in two lessons in the first week as pre-test and in the last week they were given in two lessons as post-test and it was identified by the SPSS package program whether there was a meaningful difference between the results. The implementation periods of the tests were excluded from the study implementation time.

Control Group (Face-to-face Learning) Practices: In the control group the activities that were realized according to the learning outcomes in the unit "Systems in Our Body" were applied face-to-face in line with constructivist learning approach and in accordance with the 2005 science and technology curriculum.

In the control group all classes were started in line with the suggestions in the primary seventh grade science and technology teacher's book. The stages for testing previous knowledge and arousing curiosity, discovery, explanation, development and evaluation were carried out in weekly 4 lessons again in line with the 5E cycle lesson plan in the teacher's book. Methodologies used in the lessons were question – answer, discussion, group work, problem solving etc; the course book, student workbook, posters and laboratory materials were used as resources. Appropriate activities regarding the unit in the course book and student workbook were selected and carried out. At the end of each lesson homework from the course book and workbook was given for the students to come prepared to the next class. Homework was checked and assessed in the next class.

Experimental Group-1 (Blended Learning) Practices: In the Experimental Group-1 the activities carried out in line with the learning outcomes in the unit "Systems in Our Body" were applied in line with constructivist learning approach and in accordance with the 2005 science and technology curriculum by blended learning as face-to-face and supported by the internet.

As in the control group, in the Experimental Group-1 the classes were carried out in accordance with the 5E cycle lesson plan in weekly 4 hours, adapting these to the blended learning model as a combination of face-to-face and internet-supported learning. In this group, two lessons of the weekly 4-hour science and technology course were given to face-to-face activities and the other two lessons to web-based activities. While the face-to-face activities were carried out in the same way as for the other groups, some of these activities were carried out at the same time with the web-based activities. Some web-based activities were realized in the informatics class individually and as group work. Besides the course book, student workbook, posters and laboratory materials as resources, a virtual class practice (education portal) was also used. The unit activities in the course book and the student workbook, the animations, videos, interactive activities and screening tests on the portal and when necessary, presentations, videos and pictures from other sites were selected and carried out.

Before the study, a virtual classroom was created on the education portal in this group and it was provided that the students registered in this virtual class. The researcher selected interactive animations and videos on this portal outside class and prepared homework for the students to come prepared for the topics in the next lesson, which was sent to the virtual class. Also, in order to evaluate the learning outcomes for the previous lesson, homework comprising of screening tests and questions to be solved was prepared on the virtual class and sent to the students. It was monitored daily whether the students received the homework and worked on it. The students' percentage for completing the homework was followed up and the relevant learning outcomes were concentrated on more. The student scores, their answers and the correct answers on the screening tests sent were followed up on the system based on the outcomes and the topics that were not comprehended sufficiently were repeated briefly in the next lesson and additional homework was prepared.

Experimental Group -2 (Social Media-Supported Learning) Practices: In the Experimental Group-2 the activities were carried out according to the learning outcomes in the unit "Systems in Our Body". They were applied face-to-face and social media-supported outside class in line with the 2005 science and technology curriculum and according to the constructivist learning approach.

In the Experimental Group-2 the classes were carried out in accordance with the 5E cycle lesson plan in the teacher's book in weekly 4 hours. The lessons were conducted face-to-face with techniques such as question – answer, discussion, group work, problem solving etc.; the course book, student workbook, posters and laboratory materials were used as resources. Appropriate activities of the unit in the course book and the student workbook were selected and carried out.

In the Experimental Group-2 a Facebook page for the students was opened and it was provided that the students

subscribed to the page with their Facebook accounts. Outside class the students signed in at times they specified and followed what the teacher shared and took notes according to the teacher's instructions. Their notes were checked and assessed in the next lesson. Student interaction was provided by enabling the students to share videos, visuals, questions, documents, presentations and educational games on the Facebook page. The students asked questions to their peers and the teacher about the topics they could not understand and they also answered other questions.

Besides the Facebook page, other social media tools such as YouTube, Slide share, Dailymotion, Flickr were made use of. Videos over YouTube, presentations and pdf files with notes over Slide share and photographs and pictures related to the lesson were shared over Flickr. The resources on these sites were announced to the students on the Facebook page and they were also shared with them. The students made interpretations on what they learned at the shared resources and a discussion environment was created. The resources they shared and their interpretations were checked by the teacher continuously and feedback was provided.

Data analysis

In order to specify whether the data obtained provided normal distribution, the data received from applying SDLSS and SAS pre-test – post-test were evaluated by the One Sample Kolmogorov Smirnov-Z test.

Table 3 Data displaying normal distribution conformity of the pre- and post-tests applied to the control and experimental groups

	SAS Pre-test	SAS Post-test	SDLSS Pre-test	SDLSS Post-test
Kolmogorov-Smirnov (Z)	0,710	0,713	0,553	0,621
p	0,694	0,689	0,920	0,835

The meaningfulness (p) values stated in Table 3 were higher than 0.05 level which shows that the pre-test data of the students in the control and experimental groups have normal distribution. Therefore, the inter-group data were evaluated with one-way analysis of variance (anova) from parametric tests. Also, Tukey HSD as a post hoc technique was used in order to identify the group, from which the inter-group difference was arising.

FINDINGS

Findings for the first hypothesis

The first hypothesis of the study is to specify whether there is a meaningful difference between the SAS pre-test-post-test score averages of the students in the primary 7th grade science and technology lesson, for whom blended learning, social media supported learning and face-to-face learning was applied.

Table 4 Arithmetic mean and standard deviation results regarding SAS pre-test-post-test scores of the control and experimental group students

		Pre-test		Post-test	
Dimensions	N	$\bar{x}$	sd	$\bar{x}$	sd
Control Group	24	72,042	11,771	72,667	12,430
Experimental Group-1	25	74,040	9,071	82,920	8,944
Experimental Group-2	25	73,320	9,720	78,840	9,547
Total	74	73,149	10,122	78,216	11,080

A review of Table 4 identifies that while the average of the SAS pre-test scores of the control group is 72.042, this value changed to 72.667 in the post-test. Also, it was identified that while the SAS pre-test average of the Experimental group-1 was 74.040, a review of their post-test stated that it increased to 82.920. The SAS pre-test average of the Experimental group-1 had the value 73.320 and this value increased to 78.840 at the post-test. When the results were evaluated, it was found out that while at the end of the study there had almost been no change in the SAS scores of the control group, the SAS scores of the students in the Experimental group-1 and Experimental group-2 had increased. The highest increase occurred at the Experimental group-1.

Table 5 Results of the one-way analysis of variance carried out for the SAS pre-test scores of the control and experimental group students

Source of Variation	Sum of squares	df	Mean square	F	p
Between groups	50,007	2	25,003	0,239	0,788
Within groups	7429,358	71	104,639		
Total	7479,365	73			

According to Table 5, when the SAS data applied before the study are analyzed, it is specified that there is no meaningful difference between the attitudes of the control and experimental groups regarding the science and technology lesson ($p>0.05$). This result shows that before the study the attitudes of all groups regarding the science lesson were equal.

Table 6 Results of the one-way analysis of variance carried out for the SAS post-test scores of the control and experimental group students

Source of variation	Sum of squares	df	Mean square	F	p
Between groups	1302,007	2	651,004	6,034	0,004
Within groups	7660,533	71	107,895		
Total	8962,541	73			

According to Table 6, when the SAS data applied after the study are analyzed, it is specified that there is a meaningful difference between the attitudes of the control and experimental groups regarding the science and technology lesson ($p<0.05$). In order to find out between which groups this cumulative difference obtained from the one-way analysis of variance arose, Tukey HSD test from post hoc techniques based on the homogeneity of the variances was carried out and the results are displayed in Table 7 (levene's value= 1,254 and $p>0,05$).

Table 7 Tukey HSD test results carried out for the SAS post-test scores of the control and experimental groups' students

I	J	Mean difference (I-J)	p
Experimental Group-1	Control Group	10,253	0,003
Experimental Group-2	Control Group	6,173	0,101
Experimental Group-1	Experimental Group-2	4,080	0,352

According to the results in Table 7, while there is a meaningful difference between the SAS post-test scores of the control group and experimental group-1 students in favor of the experimental group-1 ($p<0.05$), there is no meaningful difference between the experimental group-2 and the control group students and the experimental group-1 and experimental group-2 students in terms of the post-test scores ($p>0.05$). The rather high score average that the experimental group-1 students obtained compared to the control group may imply that blended learning improves the attitude regarding the science course. Although the Experimental Group-2 students increased their scores regarding the attitude towards the science course, no meaningful difference was obtained according to the control group. However, although this increase in the scores does not create a meaningful difference, it shows that social media-supported learning impacts the attitude regarding the science course positively.

Findings for the 2nd hypothesis

The second hypothesis of the study is to specify whether there is a meaningful difference between the self-directed learning skills pre-test-post-test score averages of the primary 7th grade students in the science and technology class, to whom blended learning, social media-supported learning and face-to-face learning were applied.

Table 8 Arithmetic mean and standard deviation results regarding SDLSS pre-test-post-test scores of the control and experimental group students

		Pre-test		Post-test	
Boyutlar	N	$\bar{x}$	sd	$\bar{x}$	sd
Control Group	24	88,583	12,029	89,292	11,145
Experimental Group-1	25	89,200	11,026	100,240	11,674
Experimental Group-2	25	90,040	11,156	96,360	11,431
Total	74	89,284	11,262	95,378	12,145

A review of Table 8 shows that while the score average of the control group at the SDLSS pre-test was 88.583, this value was 89.292 in the post-test. The SDLSS pre-test average of the experimental group-1 was 89.200 and it was specified at the examination of the post-test scores that it had increased to 100.240. While the SDLSS pre-test average of the experimental grou-2 received a value of 90.040, this value reached 96.360 at the post-test. An evaluation of the results obtained shows that while there has been almost no change in the SDLSS scores of the control group, the SDLSS scores of the Experimental group-1 and Experimental group-2 students have increased.

Table 9 Results of the one-way analysis of variance carried out for the SDLSS pre-test scores of the control and experimental group students

Source of variation	Sum of squares	df	Mean square	F	p
Between groups	26,247	2	13,124	0,101	0,904
Within groups	9232,793	71	130,039		
Total	9259,041	73			

Table 9 shows that before the study there was no meaningful difference between self-directed learning skills of the control and experimental groups ($p>0.05$). According to this result, it can be postulated that before the study the self-directed learning skills of all groups were equal.

Table 10 Results of the one-way analysis of variance carried out for the SDLSS post-test scores of the control and experimental group students

Source of variation	Sum of squares	df	Mean square	F	p
Between groups	1504,127	2	752,064	5,764	0,005
Within groups	9263,278	71	130,469		
Total	10767,405	73			

According to Table 10, there is a meaningful difference between the self-directed learning skills of the control and experimental groups after the study ($p<0.05$). In order to find out between which groups this cumulative difference obtained from the one-way analysis of variance arose, Tukey HSD test from post hoc techniques based on the homogeneity of the variances was carried out and the results are displayed in Table 11 (levene's value = 0.462 and $p>0,05$).

Table 11 Tukey HSD test results carried out for the SDLSS post-test scores of the control and experimental groups' students

I	J	Mean difference (I-J)	p
Experimental Group-1	Control Group	10,948	0,004
Experimental Group-2	Control Group	7,068	0,084
Experimental Group-1	Experimental Group-2	3,880	0,457

According to the results in Table 11, while there is a meaningful difference between the SDLSS post-test scores of the control group and the experimental group-1 students in favor of the experimental group-1 ($p<0,05$), no meaningful difference has been observed between the experimental group-2 and control group students and the experimental group-1 and experimental group-2 students in terms of post-test scores ($p>0,05$). The rather high score average that the experimental group-1 students obtained compared to the control group may imply that

blended learning improves self-directed learning skills. Although the Experimental Group-2 students increased their scores regarding self-directed learning skills, no meaningful difference was obtained according to the control group. However, this increase in the scores shows that social media-supported learning impacts self-directed learning skills positively.

CONCLUSIONS

As a result, while blended learning increases the attitude towards the science course and the self-directed learning skills meaningfully compared to the control group, social media-supported learning does not create a meaningful difference compared to the control group although it impacts self-directed learning skills and the attitude towards the science course positively.

In this study it is observed explicitly that blended learning succeeds in changing the attitude towards the science class positively. This impact has come forward in other studies as well (El-Deghaidy & Nouby, 2008; Kirişcioğlu, 2009; Oh & Park, 2009; Korkmaz ve Karakuş, 2009). In his study on examining the effectiveness of blended learning in science laboratory lessons from different aspects, Kirişcioğlu (2009) determined that the perceptions of students towards the science laboratory lesson and regarding blended learning are positive.

There are also studies, in which differences in favor of traditional instruction in students' attitudes have been specified. In his doctoral thesis at North Texas University, Pearcy (2009) compares blended learning methodology to traditional face-to-face and web-based distance learning and investigates the impact on the academic performances of students, their attitudes towards the class and their level of satisfaction. It was specified that while the general level of satisfaction of students was rather high, there was a meaningful difference in their attitudes towards the lesson in favor of traditional instruction.

Although the scores of the social media-supported learning group for the attitudes towards the science lesson were higher than the attitude scores of the face-to-face learning group, statistically there was no meaningful change. However, using the social media with different methodologies in the science lesson may provide this positive change to create a meaningful difference.

According to the results of this study, blended learning improves self-directed learning skills of the students. It is believed that the meaningful difference created by blended learning in terms of self-directed learning skills arises from a better organized and comprehensive internet implementation and from effective use of the internet.

The suitability of both face-to-face activities and interactive activities over the web may have provided the improvement of these skills for the students in the blended learning group. It is also believed that the materials in the portal used by the blended learning group being at hand for the students to reach videos, visuals, resources or questions like a library, following students' performances on an electronic environment in a more organized way and taking the necessary measures, the organization of the resources providing the students to take notes on their own and giving them the opportunity to review the resources without time limitations improved the self-directed learning skills of this group.

The social media-supported learning group improved their self-directed learning skills less compared to the blended learning group and more compared to the face-to-face learning group. According to the personal observations of the teacher, it is believed that the lesser extent of improvement of the self-directed learning skills of the social media-supported learning group compared to the blended learning group arises from the facts that the social media environment is not a very well-organized environment, that the students show a greater interest to the friends contact feature of the social media, that the desired information can only be reached by a search in an environment organized restricted by time, which sometimes becomes boring.

When all the above are taken into consideration, using those social media tools which are more suitable for education can both create a difference in the attitude regarding the science class and can also improve self-directed learning skills. The establishment and use of social network sites used for education only such as Edmodo in recent years will help increase the significance of social media-supported learning. Blended learning environments and social media practices are needed for the students to reach information without any difficulty from the internet and education sites with virtual libraries and from videos and visuals sharing sites and to acquire the habit of using this information in their learning.

REFERENCES

Akın, M. (2007). Bilgisayar ve internet teknolojilerinden yararlanmanın uygulama alan bilgisi oluşturma yönünde etkisi (Erzincan Eğitim Fakültesi Örneği). *Erzincan Eğitim Fakültesi Dergisi, 9(2)*, 49-70.

Akınoğlu, O. (2001). *Eleştirel düşünme becerilerini temel alan fen bilgisi öğretiminin öğrenme ürünlerine etkisi.* Yayımlanmamış Doktora Tezi, Hacettepe Üniversitesi, Ankara.

Altun, A., Gülbahar, Y. & Madran, O. (2008). Use of a content management system for blended learning: perceptions of pre-service teachers. *Turkish Online Journal of Distance Education-TOJDE, 9 (4),* 138-153.

Aydede, M. N. & Kesercioğlu, T. (2009). Fen ve teknoloji dersine yönelik kendi kendine öğrenme becerileri ölçeğinin geliştirilmesi. *Çukurova Üniversitesi Eğitim Bilimleri Dergisi, 3 (36),* 53-61.

Boyd, D. M. & Ellison, N. B. (2008). Social network sites: definition, history and scholarship. *Journal of Computer- Mediated Communication, 13 (1),* 210-230.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö.E., Karadeniz, Ş. & Demirel, F. (2009). *Bilimsel araştırma yöntemleri.* Ankara: Pegem-A Yayıncılık.

Carman, J. M. (2002). Blended learning designs: five key ingredients, knowledgenet. Retrieved from http://ipislam.edu.my/kplir/bahan/Blended-Learning-Design.pdf

Cavalli, E., Gnudi, A., Iovino, D., Lorenzi, A. & Malvisi, L. (2007). Lecturer perception of the effectiveness of blended learning and institutional support mechanisms, *EDEN 2007 Annual Conference*, Naples, Italy.

Collis, B. (2003). Course redesign for blended learning: modern optics for technical professionals. *International Journal of Continuing Engineering Education And Lifelong Learning, 13 (1/2),* 22-38.

Driscoll, M. (2002). Blended learning: let's get beyond the hype. *LTI Newsline: Learning & Training Innovation.* Retrieved from http://www-07.ibm.com/services/pdf/blended_learning.pdf

El-Deghaidy H. & Nouby, A. (2008). Effectiveness of a blended e-learning cooperative approach in an Egyptian teacher education programme. *Computers & Education, 51,* 988–1006.

Finch, A. E. (2008). Using course software (moodle) to provide an effective blended learning curriculum. *Media in Foreign Language Teaching and Learning, Proceedings of CLASIC 2008,* 155-159.

Garnham, C, & Kaleta, R. (2002). Introduction to hybrid courses. *Teaching with technology today, 8* (6). Retrieved from http://www.uwsa.edu/ttt/articles/garnham.htm

Garrison, D. R. & Kanuka, H. (2004). Blended learning: uncovering its transformative potential in higher education. *Internet and Higher Education, 7 (2),* 95-105.

Graham C. R. (2006). *Blended learning systems: Definition, current trends, and future directions. The handbook of blended learning global perspectives, local designs.* SanFrancisco, CA: Pfeiffer. Retrieved from http://www.publicationshare.com/graham_intro.pdf

Graham, C. R., Allen, S. & Ure, D. (2003). *Blending learning environments: a review of the research literature.* Unpublished manuscript, Prove, UT.

Gülbahar, Y., Kalelioğlu, F. ve Madran, O. (2010). Sosyal ağların eğitim amaçlı kullanımı. *XV. Türkiye'de İnternet Konferansı.* İstanbul: İstanbul Teknik Üniversitesi. Retrieved from http://orcun.madran.net/yayinlar/sosyal_aglarin_egitim_amacli_kullanimi.pdf

Jones, N., Blackey, H., Fitzgibbon, K. & Chew, E. (2010). Get out of MySpace! *Computers & Education, 54(3),* 776–782.

Karaman, S., Özen, Ü., Yıldırım, S. ve Kaban, A. (2009). Açık kaynak kodlu öğretim yönetim sistemi üzerinden internet destekli (harmanlanmış) öğrenim deneyimi. *Akademik Bilişim Konferansı 2009,* Harran Üniversitesi, Şanlıurfa.

Karasar, N. (2005). *Bilimsel araştırma yöntemi.* Ankara: Nobel Yayın Dağıtım.

Kirişçioğlu, S. (2009). *Fen laboratuvar derslerinde harmanlanmış öğrenme etkinliğinin çeşitli boyutlarda incelenmesi.* Yüksek Lisans Tezi, Celal Bayar Üniversitesi Fen Bilimleri Enstitüsü, Manisa.

Korkmaz, Ö. ve Karakuş, U. (2009). The impact of blended learning model on student attitudes towards geography course and their critical thinking dispositions and levels. *TOJET-The Turkish Online Journal of Educational Technology, 8 (4), 51-63.*

Lilje, O. & Peat, M. (2007). Use of traditional and elearning components in a blended learning environment. *Uniserve Science Teaching and Learning Research Proceedings,* 177-180. Retrieved from http://science.uniserve.edu.au/pubs/procs/2007/35.pdf

Oh, E. & Park, S. (2009). How are universities involved in blended instruction? *Educational Technology & Society, 12 (3),* 327–342.

Orhan, F. (2007). Applying self-regulated learning strategies in a blended learning instruction. *World Applied Sciences Journal, 2(4),* 390-398.

Osguthorpe, R. T. & Graham, C. R. (2003). Blended learning environments definitions and directions. *The Quarterly Review of Distance Education, 4* (3), 227-233.

Pearcy, A. G. (2009). *Finding the perfect blend: a comparative study of online, face to face and blended instruction.* Yayınlanmamış Doktora tezi, University Of North Texas, USA.

Rovai, A. P. & Jordan, H. M. (2004). Blended learning and sense of community: a comparative analysis with traditional and fully online graduate courses. *The International Review of Research in Open and Distance Learning, 5 (2),* 1-13

Sancho, P. Corral, R., Rivas, T., Gonza´lez, M. J., Chordi, A. & Tejedor, C. (2006). Instructional design and assessment: A blended learning experience for teaching microbiology. *American Journal of Pharmaceutical Education, 70 (5)*, Article 120.

Singh, H. & Reed, C. (2001). *A white paper: Achieving success with blended learning. Lexington.*MA: CentraSoftware. Retrieved from http://chriscollieassociates.com/BlendedLearning.pdf

Singh, H. (2003). Building effective blended learning programs. *Issue of Educational Technology, 43 (6)*, 51-54.

Uluyol, Ç. & Karadeniz, Ş. (2008). Harmanlanmış öğrenme ortamlarında proje temelli öğrenmeye ilişkin öğrenci görüşleri, *International Educational Technology Conferenece (IETC)*, 257–262.

Uluyol, Ç. & Karadeniz, Ş. (2009). Bir harmanlanmış öğrenme ortamı örneği: öğrenci başarısı ve görüşleri. *Yüzüncü Yıl Eğitim Fakültesi Dergisi, 6(1)*, 60-84.

Uzun, A. & Şentürk, A. (2010). Blending makes the difference: comparison of blended and traditional instruction on students' performance and attitude in computer literacy. *Proceedings of International Educational Technology Conference - IETC (1)*, 242-246.

Wilson, D. & Smilanich, E. (2005). *The Other Blended Learning: a classroom-centered approach*. San Francisco, CA: Pfeiffer.

Young, J. R. (2002). Hybrid teaching seeks to end the divide between traditional and online instruction. *The Chronicles of Higher Education, A33*. Retrieved from http://chronicle.com/article/Hybrid-Taching-Seeks-to/18487

The Influences of Technical Support, Self Efficacy and Instructional Design on the Usage and Acceptance of LMS: A Comprehensive Review

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ABSTRACT
Innovation, globalization and the rapid expansion of technologies are the current trend now, which lead to the use of latest technologies in several different sectors, including education sector without exception. Learning management system (LMS) that is used for delivering education has become one of the most important innovative tools that is widely used and implemented by educational institutes and universities all over the world. Therefore, it is clear that LMS provides its users with huge benefits. Although LMS has been successful in developed countries and its huge benefits have been gained, the implementation of LMS in developing countries has failed either partly or fully, and its utilization is not complete and considered below the satisfactory level. For an example, in Saudi Arabia, which is considered as one of the developing countries, LMS has been implemented by universities for many years, however its utilization is still under the satisfactory level among both the academic staffs and the students. Organizational, technological and self factors, such as the technical support, self efficacy and instructional design of LMS are believed to be the barriers in Saudi Arabia that may have prevented or decreased the utilization of LMS. Therefore, this paper intends to review the literatures that are related to all the studies that used Technology Acceptance Model (TAM) recently to investigate empirically the influence of factors, majorly the technical support, self efficacy and instructional design, along with other factors that may influence the usage and acceptance of LMS. By reviewing the literatures, it is found herein that enjoyment and self efficacy factors within the context of LMS are mostly examined empirically by using TAM, while technical support, self efficacy and instructional design of LMS have not been empirically and simultaneously examined by using TAM at the global level.

Keywords: Learning management system, Technology acceptance model, external factors, self efficacy, technical support, instructional design.

INTRODUCTION
learning management system (LMS) is a web-based application that carries out the implementations of internet services and web based supporting mechanisms, namely producing, delivering and maintaining online courses, enrolling and administration of students, and performance reporting of students (Dagger et al., 2007). Furthermore, Goh et al (2013) explained that LMS supports and manages students with 24/7 (always available) mode to all subject materials, while also monitors and reports students activities. In term of features, the LMS platform provides an online based educational environment, including quizzes and questionnaires, which operate under web 2.0 platforms (Goh et al, 2013).

As an emerging technology, many academic institutions in higher education have adopted and operating LMS platform, whether it is in commercial perspective, through Blackboard platform, and open source perspective, through Moodle platform (Al-Busaidi & Al-Shihi, 2010). In order to prove the significance of LMS, it was found that 90% of the higher academic institutions in the United States of America (USA) provide its courses and programs via LMS platform (Jones, Morales, & Knezek, 2005, p. 219). Apart from the USA, countries in the Asia (Bonk, Lee, & Reynolds, 2009), some countries under the Gulf Cooperation (Dutta& Mia, 2011), the UK

Universities (Walker et al, 2011), and the Australian Universities have increasingly adopted the LMS platform into the operations (Curtis & Lawson, 2001 ; Ellis et al, 2006). Similarly, Middle East countries have realized the promising features of LMS and henceforth actively adopting the platform into the academic systems (Robinson and Ally, 2009). In a more detailed study, Abdallah (2010) reported that 96% of the Arab universities adopted LMS platform as the engine to operate the e-learning services to provide real-time support and learning environments.

Currently, most of the success stories of LMS implementations were limited to the educational institutes in developed countries, where these countries significantly benefitted from the advantages of LMS platform (Paulsen, 2003). However, LMS platform was not widely successful in the developing countries due to not meeting the requirements of a developing nation (Borstorff and Lowe, 2007; Khan et al, 2010; Saeedikiya et al, 2010). Khan et al (2010) reported that the developing countries are still lagging behind in the area of e-services compared to the developed countries, where there are several shortcomings including the limitations of human resources and technical competencies. As a result, the shortcomings lead to a further widening of gap between developed and developing countries toward the implementation of e-services. In a study conducted by Ssekakubo et al (2011), 5 Universities from the region of Africa were considered for the investigation of the underlying problems that induced the failure of LMS platform. The study revealed that low familiarity with LMS platform, insufficient know-how competency of the platform, insufficient support system, and poor marketing strategy were among the reasons that caused the failure of the implementation of the platform.

In other studies in Saudi Arabia, it was found that LMS is adopted and applied in higher academic institutions for many years, but the overall usage of LMS platform is insignificant and hence has not met the required usage level (Woods et al, 2004; Al-Judi, 2011; Bousbahi and Alrazgan, 2015). For LMS platform in Saudi Arabia, the factors that may have prevented the sufficient usage of LMS could be due to organizational, technology and personal barriers, which include the technical support, computer self efficacy and instructional design of LMS platform (Asiri et al, 2012). Therefore, this paper intends to review the recent literatures to investigate on the empirical studies that focused and examined on these particular factors, and how these factors relatively influenced the LMS use and acceptance by using Technology Acceptance Model “TAM”. The following section will discuss on the details of TAM and justify on the candidacy of TAM to examine the factors within this review instead of other theories of technology acceptance.

Technology Acceptance Model (TAM)

The founding model of TAM was carried out by Davis (1989), and defined as a theory of information system that models and explains the user perception and acceptance toward a technology. In the exact context of Davis (1989), TAM provides "An explanation of the determinants of technology acceptance that is generally capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis, 1989, p. 985).

There are 5 different constructs in the TAM model, namely perceived ease of use ”PEU”, perceived usefulness “PU”, attitude towards use ”ATT”, behavior intention to use “BI” and actual use “AU”. As reported by Davis (1989) on TAM, PU and PEU are internal belief constructs, which are the initial determinants for users to create a positive or negative perception towards a technology. PU can be defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p.320). PEU can be defined as “the degree to which a person believes that using a particular technology would be free from effort” (Davis 1989, p.320). It is clear from the definitions of PEU and PU that PU has a dependency to PEU, which means that if an individual finds a technology “easy to be used”, then the perception towards the technology would be “useful”. The overview of TAM Model is illustrated in the following figure.

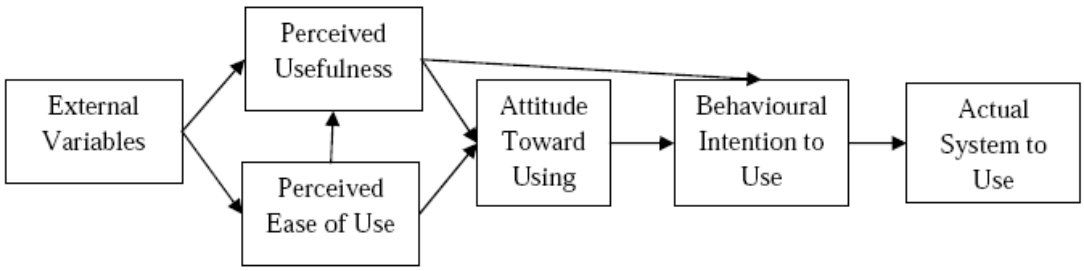

Figure: the Technology Acceptance Model (TAM)
Source: (Davis, Bagozzi & Warshaw, 1989)

There are theories that provide many different perspectives of users' aspect and acceptance towards a technology. The well known theories that cover users' aspect and acceptance are theory of the diffusion of innovation, theory of planned behavior (TPB), the DeLone and McLean model of IS success[36], and as well as the chosen TAM for the research framework herein. As stated, TAM is picked as the candidate for the research framework herein because the model was found to be widely used, greatly predictive, and directly influences the perception, acceptance and adoption of information technology (Davis, et al., 1989; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008; Al-Busaidi & Al-Shihi,, 2010; Alharbi, Drew, 2014). Furthermore, TAM had been empirically validated and proven to be operated with exceptionally high quality (Chau, 1996; Adams, Nelson & Todd, 1992). TAM is also known for its flexibility towards applications since it can operate with wide range of external variables and dependent variables, namely varying work environment, culture, and various features within worldwide technologies (Seyal & Rahman, 2007; Chuttur, 2009). Besides, TAM is being widely adopted as the tool to examine the e-learning process, however, currently applying TAM to the LMS application is not a popular research work (Psycharis et al, 2011; as cited in Alharbi and Drew, 2014).Therefore, due to the enormous studies conducted on TAM without covering the essentials for LMS, the proposed investigation will analyse the recent empirical studies on the contribution of external factors toward the usage and acceptance of LMS. Some of the important external factors will be considered for this investigation are self-efficacy, technical support, instructional design and along with other minor factors,

The external factors that influence on LMS use

In this paper, the investigation will primarily focus on the analysis of the recent empirical studies on external factors that influenced LMS via TAM, namely self-efficacy, technical support, instructional design and along with other minor factors. However, it is also important to have a deep understanding of these factors prior to the meta-analysis that will be carried out and discussed in the upcoming sections.

Technical support

Technical support is one of the key external factors, which basically conducted by providing support when required by experts to end-users on software and hardware related products. The support can be carried out through various mediums, while the well known mediums are online, over the phone or fax, help desk, machine-readable method for knowledge bases, remote login, and other least used mediums (Ralph , 1991). In a study conducted by Igbaria (1990), the proposed techniques for technical support were carried out in two directions. The first direction was to support end-users through software tools, relevant documents and manuals, whereas the second direction was through the management support by directly providing large pool of resources.

In an actual e-learning environment, technical support is one of the essential elements that convince end-users to have a positive perception and accept a technology (Hofmann, 2002; Sumner & Hostetler, 1999; Williams, 2002; Sa´nchez et al 2013; Mirani & King, 1994). A very helpful technical support system will create a positive perception among the system users and information technology experts, which will lead to a higher chance of success for a new technology (Igbaria, 1990,; Sa´nchez and Hueros, 2010). Contrarily, a weak support system will be an obstacle for a technology to succeed. For an example, it is believed in Saudi Arabia that the technical support is considered as one of the organizational barriers that may prevent learners from using and accepting LMS (Asiri et al, 2012).

Computer self efficacy

Self-competency of using computers or better known as Computer self efficacy (CSE) is the ability of an individual to perform and organize multitasking actions to achieve the required performance. In this context, efficacy does not only refer to the skills possessed by an individual, but also the method of applying the relevant skills to achieve the desired goal (Bandura, 1986). As reported by Marakas et al (1998), CSE can be categorized as task-specific and general. The Task-specific CSE is the ability of an individual to use any applications or systems in a single generic computer domain, whereas an individual that is able to work on cross-platform computers is known to have the general CSE.

In the CSE domain, literatures revealed that technology acceptance is a primary criterion (Brown, 2002; Miller et al, 2003; Hayashi et al, 2004; Grandon et al, 2005). On the other hand, it was found that individuals who were weak in CSE lose the motivation of carrying out computer related tasks compared to those who were competent in CSE (Compeau and Higgins, 1995).

In the context and applications of LMS, CSE is achieved when an individual could operate and work based on self ability without requiring any external aid. In most cases, end-users with sufficient CSE will likely to have positive perceptions of PEU and PU toward a system. Contrarily, when end-users have lower CSE towards a

system, considering LMS system within this context, the users' judgment would be either "difficult to use" or "less useful" towards the system.

Instructional design

Instructional design is known as the complete system structuring and design cycle that can be categorized into several layers, namely understanding the desired knowledge, preparing all requirements for design, exhibiting the process of authoring, aligning the prepared materials and the requirement, followed by the evaluations of effectiveness and efficacy toward the material (Seels & Richey, 1994). As reported by Chang (1999) and Barker (2003), the processes of e-learning system design can be similar to a classroom format, where the processes are explaining the course details, followed by its contents, objectives, aims, purposes, and method of evaluation. Most importantly, meticulous considerations should be given to the interactions among students and instructors during the design and development phase of the content of the e-learning system (Picciano, 2001). Therefore, it is important that LMS adopts the instructional interactivities among students and instructors and correlate it with its content.

METHODOLOGY

The review of literature is an objective that requires summarising and analysing critically the related available literature regarding specific topic being studied (Hart, 1998). Its main objective is to make the reader aware of the latest available literature regarding a specific topic and build the basis for achieving another objective, such as the need and justification for carrying out further researches in that specific field. An ideal review of literature involves gathering information regarding a specific topic from many different resources. Literature review should be well written and well structured. It should also take account of a clear selection strategy and research (Carnwell and Daly, 2001). Moreover, the ideal structuring is of utmost importance for enhancing the readability as well as the flow of the review. The use of accurate terminologies is essential, jargons have to be kept to minimum, and the referencing should also be used accurately within the review (Colling, 2003). Therefore, all these aspects have been given due consideration while doing the current review. This study aims to review all the recent published articles that used Technology Acceptance Model (TAM) as the theoretical framework to examine the effects of external factors, namely technical support, computer self efficacy and instructional design of LMS along with any other factors related to the usage and acceptance of LMS. The initial approach adopted to conduct this investigation involves searching through numerous electronic databases, namely ProQuest, Web of science, IEEExplore, digital library and Google scholar. The keywords used to find the related publications include Technology Acceptance Model AND Learning Management System, TAM AND LMS, TAM and e-learning Systems. The search process resulted in more than 45 publications, which of only 12 are chosen as these papers were falling within the scope of the topic and were meeting the following criteria: 1- The study should use Technology Acceptance Model (TAM) to examine the influence of any external factors on LMS usage and acceptance, and 2- All studies should be published within the period of 2010 to present. By carrying out in-depth reading of the papers, combined with notes and discussions on TAM as well as the external factors that are mainly focusing on technical support, self efficacy, and instructional design along with other used factors, the influencing mechanisms on the usage and acceptance of LMS are summarised. The next section will present the results of the review, and will be followed by the discussions.

Result I

N	year	Author/s	Location	Technical support	Computer self efficacy	Instructional design	Other External factors used in the study	The purpose of the research/ scope of the study
1	2010	Al-hawari and Mouakket	United Arab Emirate "UAE"	✗	✗	✓	Enjoyment	To show the significance of TAM's original factors with some external factors of "enjoyment" on students' usage and acceptance of LMS
2	2011	Almarashdeh, Sahari, Mat Zin, and Lambadi	Malaysia	✗	✗	✗	None, the authors only used the original constructs of TAM	To examine the influence of original TAM factors on students and instructors' use of LMS, and to test the applicability of TAM
3	2012	Al-Aulamie, Mansour, Daly, and Adjei	UK	✗	✗	✗	Enjoyment and computer playfulness	Relying on TAM, this study aimed to propose an extended model to investigate the influence of enjoyment, computer playfulness on undergraduate and postgraduate, and students' use of LMS.

4	2013	Sa´nchez, Hueros and Ordaz	Spain	✓	✓	✗	None	to investigate the factors of technical support and self efficacy that determine the acceptance of LMS among students
5	2013	Cheng	Taiwan	✗	✗	✗	Interactivity and enjoyment	To examine the influence of interactivity and enjoyment factors on students' intentions to use and the actual application of LMS
6	2013	COŞKUNÇAY and ÖZKAN	Turkey	✗	✓	✗	Technology complexity, compatibility and subjective norms	To examine the factors of technology complexity, compatibility and subjective norms on academics' intention to use and the application of LMS.
7	2014	Alharbi and Drew	Saudi Arabia	✗	✗	✗	LMS usage experience and job relevance	To propose an extended TAM model, and examine the influence of LMS usage experience and job relevance toward the academics' intention of using LMS.
8	2014	Majdalawi, Almarabeh and Mohammad	Jordan	✗	✗	✗	GPA, academic year, and faculty	To examine the influence of some external factors, including GPA, academic year, and faculty on students' intention of using LMS
9	2014	Juhary	Malaysia	✗	✗	✗	None, the author used the original constructs of TAM	To investigate the influence of the original TAM constructs", including both PEU and PU on students' intention of using LMS.
10	2015	Bousbahi and Alrazgan	Saudi Arabia	✓	✗	✗	Motivation, load anxiety	To examine the influences of motivation, technical support and load anxiety on academics' usage and acceptance of LMS
11	2015	Shin and Kang	South Korea	✗	✓	✗	System accessibility and subjects norms	To investigate the influence of system accessibility and subjects norms on students' usage and acceptance of LMS through the mobile learning platform
12	2015	Fathema, Shannon and ross	United states	✗	✓	✗	System quality and facilitation condition	To investigate the factors of system quality, self efficacy and facilitation condition that influenced the academics' intention to use and the actual application of LMS.

As indicated in the table I, there are interests in investigating the factors that may have influenced the usage and acceptance of LMS by applying TAM. In the year of 2015, there were three studies that examined the influences of external factors on the usage and acceptance of LMS (Fathema et al 2015; Shin and Kang 2015; Bousbahi and Alrazgan 2015). These studies revealed the trend and value of using TAM to extend and investigate the LMS empirically into several different factors. Some of these studies focused the investigation of the influence of the external factors on the usage and acceptance of LMS towards academic members, students, or both. Furthermore, only two particular articles used the original TAM constructs of PEU and PU to examine the impacts on the usage and acceptance of LMS. Rest of the articles used TAM and extended it to include other external factors that influenced the usage and acceptance of LMS. The following section will elaborate the results into more details.

DISCUSSION

A- The factors that influenced usage and acceptance of LMS:

Based on the meta-analyses that has been summarized in table I, it is clear that several different external factors and their influences on the usage and acceptance of LMS have been investigated by using TAM. Some examples of these factors are instructional design, enjoyment, self efficacy, motivation, load anxiety, system actability and along with other factors. However, it is notable that some of the external factors, including enjoyment and self efficacy are used in several studies.

Most developing countries did not experience a successful implementation of the LMS system, hence the system could not apply its complete potential in these countries and resulted in partial or full failure. (Borstorff and Lowe, 2007; Khan et al, 2010; Saeedikiya et al, 2010). In the African continent, Ssekakubo et al (2011) carried out investigations across 5 universities and found the possible reasons that induced the failure of LMS, namely low familiarity, trouble to operate, insufficient support, little knowledge in ICT area among students, and poor marketing strategy. Based on the meta-analyses conducted herein, some of the failures in implementing LMS are low comfort level with the technology or low self efficacy, and insufficient technical support as stated by Ssekakubo et al (2011), have been examined by Sa´nchez et al (2013), COŞKUNÇAY and ÖZKAN (2013), and Bousbahi and Alrazgan (2015).

On the other hand, there were institutes implemented LMS in developed countries and successfully enjoyed its enormous advantages (Paulsen, 2003). Therefore, it is no surprise that most of the studies shown in the table I are focused toward developing countries, including Jordan, Saudi Arabia, United Arab Emirate, Malaysia and among others. Furthermore, these countries aimed to increase the utilizations of LMS among its users as the implementation of LMS has not been successful (Ssekakubo et al ,2011: Bousbahi and Alrazgan, 2015). However, the implementation of LMS cannot be successful until unless there are investigations into the factors that may have prohibited and prevented end-users, both students and academics, from using LMS. Adzharuddin & Ling (2013) reported on the importance of knowing the factors that changed the perception of students' toward a technology, because this will directly aid the academicians and administrators to attract increased number of students that preferred the learning environment that directly utilized a technology.

In Saudi Arabia, many studies have confirmed that the utilization of LMS was below the satisfactory level (Woods et al, 2004; Al-Judi, 2011; Bousbahi and Alrazgan, 2015). It is believed that some of the factors such as technical support, self efficacy and instructional design of LMS, as stated by Asiri et al (2012), may influence on the LMS usage. As indicated in the meta-analyses, only two studies are using TAM to probe and examine some factors that may influence the LMS usage in Saudi Arabia. Alharbi and Drew (2014) pioneered the research work on TAM that operated with many external variables, namely, user experience of LMS, job relevancy to investigate factors influencing on academic members' behavior intention to use LMS. Results showed that these factors either directly or indirectly influence on academic behavior intention to use LMS. Thereafter, Bousbahi and Alrazgan (2015) reported an alternative study involving external factors for TAM, including load anxiety; motivation and organization support, to examine the impacts of the these external factors on faculty members' usage and acceptance of LMS . Results showed that these external factors play a significant role in influencing the perception of usefulness of LMS among them. Both studies clearly demonstrated that external factors significantly influenced the academicians' perception toward the use of LMS. However, the studies by Alharbi and Drew (2014) and Bousbahi and Alrazgan (2015) did not unveil the behavior of students toward LMS, and concurrently failed to include some important factors suggested by Asiri et al (2012), namely technical support, self efficacy and instructional design for the usage and acceptance of LMS. Interestingly, based on the meta-analyses shown in table I , the three factors that believed to be barriers, have not yet investigated empirically and simultaneously together using TAM not only in Saudi context, but even globally. Therefore, there is a need to conduct an empirical investigation into these factors to find out whether these factors influence on students' intention to use and their actual use of LMS.

It is also notable from the table that even though there is a trend moving towards the usage of TAM to investigate the factors that influence the usage and acceptance of LMS, it is still considered insufficient amount of studies for TAM compared to other technologies, namely e-learning, digital technologies and others. As reported by Park (2009), usage of TAM was rapidly increasing as an explanatory tool to investigate the e-learning process, however applying TAM to predict LMS did not receive much attention so far (Psycharis et al, 2011; as cited in Alharbi and Drew, 2014). Therefore, there is a need for more researches to probe into the factors that may influence the LMS usage by applying TAM.

B- The potential benefits of LMS and the importance of empirically examining the factors:
Benefits of LMS

The advantages of applying LMS was reported by Alecu et al (2011), namely easier learning compared to traditional classroom learning, creates interactive and collaborative learning experiences among students, facilitates learning at own pace, very flexible learning system, and students gain access to latest materials.

The advantages of LMS also affect institutions and academicians. Due to the benefits of reduced cost, higher efficiency, flexibility, scalability, accessibility, and improved learning experience, educational institutions in developing countries are actively implementing LMS system (Borstorff and Lowe, 2007; Cavus et al, 2007; Welsh et al, 2003). Similarly, academicians/instructors recognize the advantages of LMS and the possibility of improving learning experiences of students (O'Leary and Ramsden, 2002). Furthermore, LMS also inherently motivates the students in a positive manner (de Lange et al., 2003; Follows, 1999; Potter and Johnston, 2006).
On the other hand, it is important to understand that dedicated involvement with LMS is required to enjoy its enormous benefits. Klobas and McGill (2010) reported in a study that active involvement from students was required to observe a successful implementation of LMS. In other word, the benefits of LMS are directly proportional to the intensity of the involvement of the students (Klobas and McGill, 2010). As mentioned earlier, involving students and even instructors with LMS and increasing its utilization cannot be achieved without a proper understanding and a deep investigation into the factors that may influence on them with LMS use. Therefore, the meta-analyses that are shown in the table I, shows the more efforts toward investigating into the factors that my influence on LMS use and acceptance, as they aim to increase the utilization and the involvement of LMS by empirically understanding the factors that my influence on their users to accept LMS. Furthermore, many gaps related to the factors that need to be studied have been identified, where the suggestions will be discussed in the following section.

FURTHER SUGGESTIONS

It is clear that even though LMS is implemented in some developing countries to support the learning and teaching activities, the utilization of LMS is still below the satisfactory level. Therefore, there is a move towards investigating into the factors that may prevent or decrease the utilization of LMS among its users. Examining empirically the impact of some external factors that may lead to better and increased utilizations of LMS, hence gain the huge benefits of LMS as mentioned earlier. The review of the previous studies herein examined the impact of various factors on LMS usage and acceptance and revealed the factors that have already investigated and those that are not investigated. For example, in Saudi Arabia, there is a believe that technical support, self efficacy and instructional design of LMS are the factors that may prevent or decrease the utilization of LMS among its users. Based on the review, it is clear that these specific factors have not been empirically and simultaneously examined with TAM. Furthermore, it is a fact that some of these factors have been investigated individually or with other factors (self efficacy and technical support). Therefore, there is a need to empirically probe into these factors to provide a better understanding about its influences on LMS usage and acceptance. In the same regards, Ssekakubo et al (2011) identified the reasons of LMS failure, namely a low comfort level with the technology, the usability issues of LMS, insufficient technical and user support, high rates of illiteracy of ICT among students, and the poor marketing strategy. These particular factors have not been empirically and simultaneously examined by using TAM. In general, this review has provided researchers and even developers of LMS with many gaps that have not been empirically examined, and also revealed the factors that influenced the usage and acceptance of LMS. Therefore, the present review is considered as a benchmark where a researcher can start empirical probing into the factors that have not been investigated by using TAM, hence, increasing the utilization of LMS and even involvement that will result in gaining its huge benefits.

CONCLUSION

This paper has performed an end-to-end review on the literatures and revealed a shifting trend towards the investigation of the factors that may influence the usage and acceptance of LMS by applying TAM. It was found that the factors that were mostly investigated are enjoyment and self efficacy, while other factors have rarely been examined by using TAM. Part of the study, it was found that LMS provides its users, irrespective of students or instructors, with numerous benefits. However, those benefits cannot be gained without the maximum utilization and involvement with LMS, which inherently requires understanding and investigation into the factors that may influence the usage and acceptance of LMS among its users. Most importantly, this review provided researchers with many new information on the factors that have not been investigated, and also on those which were already examined within LMS by using TAM. Further investigations regarding the factors that may influence the LMS usage, using TAM are needed, because of its lacking literatures compared to other technologies, namely e-learning and other technologies.

REFERENCES

Abdallah, S. (Ed.). (2010). ICT Acceptance, Investment and Organization: Cultural Practices and Values in the Arab World: Cultural Practices and Values in the Arab World. IGI Global.

Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: a replication. MIS quarterly, 227-247.

Adzharuddin, N. A., & Ling, L. H. (2013). Learning Management System (LMS) among University Students: Does It Work. International Journal of e-Education, e-Business, e-Management and e-Learning, 3(3), 248-252.

Alecu, I. N., Marcuta, L., Marcuta, A., & Angelescu, C. (2011). The role of an E-learning platform in the sustainable development of the online learning at the University of Agricultural Sciences and Veterinary Medicine. Distance Learning Department, Bucharest, Scientific Papers Series–Management, Economic Engineering in Agriculture and Rural Development, 11(2), 5-8.

Asiri, M. J., bt Mahmud, R., Bakar, K. A., & bin Mohd Ayub, A. F. (2012). Factors influencing the use of learning management system in Saudi Arabian Higher Education: A theoretical framework. Higher Education Studies, 2(2), p125.

Alharbi, S., & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems. learning, 5(1).

Almarashdeh, I. A., Sahari, N., Zin, N. A. M., & Alsmadi, M. (2011). Acceptance of learning management system: A comparison between distance learners and instructors. Advances in Information Sciences and Service Sciences, 3(5).\

Al-Busaidi, K. A., & Al-Shihi, H. (2010). Instructors' Acceptance of Learning Management Systems: A Theoretical Framework. Communications of the IBIMA, 2010, 2010.

Al-Judi, M. G. (2011, February). Enhancement of the performance of Taif University staff members in the area of information technology: A training need assessment. In 2nd international conference of e-learing and distance education: unique learning for next generation (pp. 21-24).

Al-hawari, M. A., & Mouakket, S. (2010). The influence of technology acceptance model (TAM) factors on students'e-satisfaction and e-retention within the context of UAE e-learning. Education, Business and Society: Contemporary Middle Eastern Issues, 3(4), 299-314.

Al-Aulamie, A., Mansour, A., Daly, H., & Adjei, O. (2012, June). The effect of interinsic motivation on learners' behavioural intention to use e-learning systems. In 2012 International Conference on Information Technology Based Higher Education and Training (ITHET).

Barker, A. M. (2003). Faculty development for teaching online: Educational and technological issues.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.

Bonk, C. J., Lee, M. M., & Reynolds, T. H. (Eds.) (2009). Preface.A special passage through Asia e-learning. Chesapeake, VA: AACE, 2009.

Bousbahi, F., & Alrazgan, M. S. (2015). Investigating IT Faculty Resistance to Learning Management System Adoption Using Latent Variables in an Acceptance Technology Model. The Scientific World Journal, 2015.

Borstorff, P. C., & Lowe, S. K. (2007). Student perceptions and opinions toward e-learning in the college environment. Academy of Educational Leadership Journal, 11(2), 13.

Brown, I. T. (2002). Individual and technological factors affecting perceived ease of use of web-based learning technologies in a developing country. The Electronic Journal of Information Systems in Developing Countries, 9.

Carnwell, R., & Daly, W. (2001). Strategies for the construction of a critical review of the literature. Nurse education in practice, 1(2), 57-63.

Cavus, N., Uzunboylu, H., & Ibrahim, D. (2007). Assessing the success rate of students using a learning management system together with a collaborative tool in web-based teaching of programming languages. Journal of educational computing research, 36(3), 301-321.

Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. Journal of Asynchronous learning networks, 5(1), 21-34.

Cheng, Y. M. (2014). Roles of interactivity and usage experience in e-learning acceptance: a longitudinal study. International Journal of Web Information Systems, 10(1), 2-23.

Chau, P. Y. (1996). An empirical assessment of a modified technology acceptance model. Journal of management information systems, 185-204.

Chang, V. (1999). Evaluating the effectiveness of online learning using a new web based learning instrument. In Proceedings Western Australian Institute for Educational Research Forum.

Chuttur, M. Y. (2009). Overview of the technology acceptance model: Origins, developments and future directions. Working Papers on Information Systems,9(37), 9-37.

Colling, J. (2003). Demystifying the clinical nursing research process: The literature review. Urologic Nursing, 23(4), 297.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. MIS quarterly, 189-211.
Coskuncay, D., & Ozkan, S. (2013). A Model for Instructors' Adoption of Learning Management Systems: Empirical Validation in Higher Education Context. Turkish Online Journal of Educational Technology-TOJET, 12(2), 13-25.
Dagger, D., O'Connor, A., Lawless, S., Walsh, E. and Wade, V.P. (2007), "Service-oriented e-learning platforms: from monolithic systems to flexible services", IEEE Internet Computing, 11 (3), 28-35.
Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. MIS Quarterly, 13(3), 319–340.
Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. Management science, 35(8), 982-1003.
De Lange, P., Suwardy, T., & Mavondo, F. (2003). Integrating a virtual learning environment into an introductory accounting course: determinants of student motivation. Accounting Education, 12(1), 1-14.
Dutta, S. &Mia,I (2011). The global information technology report 2010–2011. Geneva: World Economic Forum. Retrieved from http://www3.weforum.org/docs/WEF_GITR_Report_2011.pdf
Fathema, N., Shannon, D., & Ross, M. (2015). Expanding The Technology Acceptance Model (TAM) to Examine Faculty Use of Learning Management Systems (LMSs) In Higher Education Institutions. Journal of Online Learning & Teaching, 11(2).
Follows, S. B. (1999). Virtual learning environments. THE Journal (Technological Horizons In Education), 27(4), 100.
Grandon, E. E., Alshare, K., & Kwun, O. (2005). Factors influencing student intention to adopt online classes: A cross-cultural study. Journal of Computing Sciences in Colleges, 20(4), 46-56.
Goh, W. W., Hong, J. L., & Gunawan, W. (2013). Exploring Students' Perceptions of Learning Management System: An Empirical Study Based on TAM. IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE), (pp. 367-327). Bali Dynasty Resort, Kuta, Indonesia.
Hart, C. (1998). Doing a literature review: Releasing the social science research imagination. Sage.
Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2004). The role of social presence and moderating role of computer self efficacy in predicting the continuance usage of e-learning systems. Journal of Information Systems Education, 15, 139-154.
Hofmann, D. W. (2002). Internet-based distance learning in higher education. Tech Directions, 62(1), 28–32.
Igbaria, M. (1990). End-user computing effectiveness: A structural equation model. Omega, 18(6), 637-652.
Jones, james g.; morales, cesareo; knezek, gerald a.(2005). 3-dimensional online learning environments: examining attitudes toward information technology between students in internet-based 3-dimensional and face-to face classroom instruction, educational media international, 42 (3), 219–236.
Juhary, J. (2014). Perceived usefulness and ease of use of the learning management system as a learning tool. International Education Studies,7(8), p23.
Khan, G. F., Moon, J., Rhee, C., & Rho, J. J. (2010). E-government skills identification and development: Toward a staged-based user-centric approach for developing countries. Asia Pacific Journal of Information Systems, 20(1), 1-31.
Klobas, J. E., & McGill, T. J. (2010). The role of involvement in learning management system success. Journal of Computing in Higher Education, 22(2), 114-134.
Majadlawi, Y., Almarabeh, T., & Mohammad, H. (2014). Factors affecting students' usage of learning management system at The University of Jordan. Life Science Journal, 11(6), 666-671.
Marakas, G. M., Yi, M. Y., & Johnson, R. D. (1998). The multilevel and multifaceted character of computer self-efficacy: Toward clarification of the construct and an integrative framework for research. Information systems research, 9(2), 126-163.
Miller, M. D., Ranier, R. K., & Corley, J. K. (2003). Predictors of engagement and participation in an on-line course. Online Journal of Distance Learning Administration, 6(1).
Mirani, R., & King, W. R. (1994). Impacts of end-user and information center characteristics on end-user computing support. Journal of Management Information Systems, 11(1), 141–166.
Nof, L., & Hill, C. (2005). On the Cutting Edge–A Successful Distance PhD Degree Program: A Case Study. The Internet Journal of Allied Health Sciences and Practice, 3(2).
O'Leary, R., & Ramsden, A. (2002). Virtual learning environments. Learning and Teaching Support Network Generic Centre/ALT Guides, LTSN. Retrieved July, 12, 2005.
Paulsen, M. F. (2003). Experiences with learning management systems in 113 European institutions. Journal of Educational Technology & Society, 6(4), 134-148.
Park, S. Y. (2009). An analysis of the Technology Acceptance Model in understanding university students' behavioral intention to use e-learning. Educational Technology & Society, 12 (3), 150–162.
Picciano, A. G. (2001). Distance learning: Making connections across virtual space and time. Merrill Prentice Hall.

Potter, B. N., & Johnston, C. G. (2006). The effect of interactive on-line learning systems on student learning outcomes in accounting. Journal of accounting education, 24(1), 16-34.
Ralph, W. (1991), Help! The Art of Computer Technical Support, Peachpit Press of Berkely,
California, CA.
Robinson, M., & Ally, M. (2009). Transition to e-Learning in a Gulf Arab Country. In The 2nd Annual Forum on e-Learning Excellence in the Middle East, Dubai, UAE.
Seels, B., & Richey, R. (1994). Instructional technology: The definition and domains of the field. Association for Educational Communications and Technology.
Seyal, A. H., & Rahman, N. A. (2007). The influence of external variables on the executives' use of the internet. Business Process Management Journal,13(2), 263-278.
Sumner, M., & Hostetler, D. (1999). Factors influence the adoption of technology in teaching. Journal of Computer Information Systems, 40(1), 81–87.
Sánchez, R. A., & Hueros, A. D. (2010). Motivational factors that influence the acceptance of Moodle using TAM. Computers in human behavior, 26(6), 1632-1640.
Saeedikiya, M., Mooghali, A., & Setoodeh, B. (2010). STAGES OF THE IMPLEMENTION OF E-LEARNING IN TRADITIONAL UNIVERSITIES. Edulearn10 Proceedings, 6620-6624.
Sánchez, R., Hueros, A., & Ordaz, M. (2013). E-learning and the University of Huelva: a study of WebCT and the technological acceptance model. Campus-Wide Information Systems, 30(2), 135-160.
Ssekakubo, G., Suleman, H., & Marsden, G. (2011, October). Issues of adoption: have e-learning management systems fulfilled their potential in developing countries?. In Proceedings of the South African Institute of Computer Scientists and Information Technologists Conference on Knowledge, Innovation and Leadership in a Diverse, Multidisciplinary Environment (pp. 231-238). ACM.
Shin, W. S., & Kang, M. (2015). The use of a mobile learning management system at an online university and its effect on learning satisfaction and achievement. The International Review of Research in Open and Distributed Learning, 16(3).
Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management science, 46(2), 186-204.
Venkatesh, Viswanath, & Bala, Hillol. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision sciences, 39(2), 273-315.
Walker, D., Livadas, L., & Miles, G. (2011). Key Influencing Factors Behind Moodle Adoption in Irish Small to Medium Sized Higher Education Colleges.European Journal of Open, Distance and E-Learning.
Welsh, E. T., Wanberg, C. R., Brown, K. G., & Simmering, M. J. (2003). E-learning: emerging uses, empirical results and future directions. International Journal of Training and Development, 7(4), 245-258.
Williams, P. (2002). The learning Web: the development, implementation and evaluation of Internet-based
Woods, R., Baker, J. D., & Hopper, D. (2004). Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction. The Internet and Higher Education, 7(4), 281-297.

Using Blended Learning to Enhance Student Learning in American Literature Courses

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ABSTRACT
This study taps the English learners' interest in and attitudes toward the use of technology in English literature classes. It also investigates the influence of integrating the blended learning approach on the English literature students' learning and on the changes in their attitudes and behavior toward computer technology usage.

Questionnaires as well as the recordings on the platform dedicated to the course were employed to gather the required data. The Modular Object-Oriented Dynamic Learning Environment (MOODLE) platform had been used as a tool for applying the experiment. In addition, the online program; the Text Content Analyzer had been used to analyze the learners' participations on the forum.

The results showed the learners' positive attitudes toward using CT in learning English literature courses. They also highlighted the main obstacles impeding application, and the proper strategies that could be taken into consideration for efficient integration of CT components in the learning process. The results also showed the effectiveness of using the BL in the American Literature Course for developing and improving the learners' performance in quantity and quality; and its effect on the students' learning and behavior toward using CT.

The early interest in integrating computer technology (CT) into the educational process approximately started in the 1950s. Yet, from the 1980s forward, the idea started to occupy a noticeable position in research and application. This in turn has led to significant developments in the educational system as a whole in terms of the teaching approaches, methodologies, and learning strategies. It has also stimulated more research and exploration of the potentials of utilizing CT within the teaching-learning process in general, and teaching languages in particular.

Both theoretical and empirical evidence have testified to the effectiveness of CT in enhancing the teaching-learning process through various multimedia (Krause 2008; Mustafa 2008; Oblender 2002; Teeter 1997; Edwards and Fritz 1997). CT has been showed to provide concepts, presentations, photographs, fixed drawings and animations as well as written texts, graphs, music, and other features, in a way which simulates real-life situations. This, in turn, stimulates the learners' activity, facilitates acquisition of knowledge, and helps in keeping and employing this knowledge in real life situations. All those contributions can lead to more learning, and give learning additional meaning and significance.

In the realm of language learning, CT is used as a tool alongside other components and as a supportive or supplementary ingredient that helps language learners improve their four skills, thus creating a rich, active learning environment. The term used to express the process of using C T in learning languages is, Computer Assisted Language Learning (CALL), which in turn constitutes a prominent feature within the blended learning approach (BLA). E-Learning was perhaps the first threshold of using modern technologies in the educational process. It came as a response to the deficiency of the dominant traditional teaching approaches on the one hand and the demand for new advancements on the other. In fact, the advent of e-learning brought out the teaching-learning process from its traditional structure and concept. Traditionally, the teacher was the determiner, the obtainer and the imparter of knowledge and the students' role was restricted to passive recipients of knowledge.

E-learning brought to the teaching-learning process a broader and more progressive outlook; where the teacher has become an instructor, facilitator and planner while the learner became a researcher for information, hence, more active and effective in the teaching-learning process.

The advancements of computer technology and the advent of Internet in the late 20th century had given E-learning the impetus to expand its tools and methods in communication and delivery. It had become the phenomenon of the era. People would be able to access a wealth of online information, to learn about an endless set of subjects and to improve their different skills. It has, therefore, changed the whole landscape of the teaching-learning environment by enabling learners to learn anywhere, at any time, and at their own pace, hence, overcoming place and time constraints.

Nevertheless, E-learning is not absolutely optimal without flaws. Some educators had explored the e-learning approaches in depth and concluded that it suffers from a number of disadvantages and drawbacks. Their claims and arguments manifested the urgent need to new alternatives, which prompted the stakeholders to search for new approaches that combine the properties of both, the traditional learning and E-learning and, to overcome the deficiencies of both at the same time.

The way therefore was paved for the emergence of the blended learning approach (BLA) which blends different forms of traditional learning with various varieties of E-learning. In this sense, the BLA created an innovative teaching-learning methodology that increased the effectiveness of the teaching-learning situation and offered new opportunities for the creation of an interactive learning environment.

The main focus of this study is exploring the possibility of integrating computer technology in a more efficient way within the educational systems of Palestinian universities, particularly, the home institution of the researchers, Hebron University. But it is necessary prior to that to present a brief overview about CT status in the Palestinian educational institutions in general.

One may argue that the usage of instructional technology within the Palestinian institutions is at its lowest levels. At the formal level, administrative authorities and educational policy makers are not giving the instructional technology in general and the BLA in particular the attention they deserve. Instructional technology and BL are not adopted in the educational system, nor are they implemented or funded to be implemented in any of the educational institutions.

STATEMENT OF THE PROBLEM

The technical advances of information technology (IT) around the globe have significantly impacted the English language teaching-learning process. This impact has prompted many educational institutions to search for ways and invest more efforts in integrating CT within their educational systems. However, and despite all efforts, the available technological capacity is still at a lower level than that needed to confront the challenges of integrating technology into the educational systems on the ground.

On the national and international levels, for instance, the researcher found plenty of research tackling the influence of technology on language learning in general, yet very few studies which investigate the use of technology in teaching English literature specifically. This might be due to the erroneous perception that literature courses are better taught in a traditional manner.

In the case of Hebron University and despite the availability of the necessary equipment and infrastructure, instructional technology is not utilized to serve the teaching-learning process effectively. Technology is only used superficially for marginal purposes, e.g., uploading the academic plan, adding some electronic resources (videos, recordings…etc), and to some extent receiving and delivering assignments.

The above-mentioned factors at Hebron University instructional environment, in addition to the significant gap in research and the scarcity of studies related to the use of instructional technology in teaching literary courses, stimulated the researchers to conduct this study, with a specific choice of "American Literature Course" to be the subject of the experiment which will hopefully contribute to bridging the theoretical gap in the domain and to adding new practical evidence that CT in general and the BLA in particular can contribute enormously to the effective learning of English literature courses.

The choice of "American Literature" to be the subject of the experiment emerged from the fact that it is the only course in the plan about the topic; which means that teaching the course traditionally confines students to the content and topics presented in the textbook and by the teacher within the classroom lectures. Using technology,

on the other hand, may offer wider vistas and additional prospects of exposure to authentic American literature and culture.

THE PURPOSE OF THE STUDY

The researchers ultimately aim at enhancing the views and calls concerning technology effectiveness in the teaching-learning process in general, and in teaching literary courses in particular. To achieve firm results with authentic supportive evidence, the researchers have conducted an empirical project within Hebron University through applying the BLA in teaching one of the English Major Courses, namely, "American Literature".

The researchers expect through the experiment to obtain positive results concerning the influence of the BLA on the students' learning and attitudes which could support integrating technology in teaching literary courses. And in case of success it might lead to redesigning this course to be taught via the BLA.

RESEARCH QUESTIONS

The following questions will be addressed in this study:

1- What are the attitudes of the learners at Hebron University toward technology implementation in English Literature courses?
2- What is the influence of integrating the BL components in the traditional literature course “American literature” on learners’ attitudes and their learning at Hebron University?

LITERATURE REVIEW

Studies which explored the potentials of using technology in teaching literature provided supportive evidence to such an orientation. Jain (2012) asserted that using Information Communication Technology (ICT) in teaching English literature can provide a supplementary pillar and an additional resource to the traditional mode. It can make the process more interesting for learners and teachers and it brings vitality to the subject. Moreover, it motivates the learners and prompts their engagement.

Furthermore, it increases learners' comprehension and improves their proficiency. It also helps the teacher in research in various fields of literature and to use variant methods of teaching. Jain concludes by emphasizing the importance of ICT in teaching and learning literature in all languages.

A study introduced by Amiri (2012) based on the assumption that technologies have always been interesting to the students. To prove the validity of this assumption, Amiri reviewed some scholars' perceptions. His aim was discussing to which extent ICT and Virtual Learning Environment (VLE) could contribute to the teaching of English language and literature.

Depending on Carol (1998), Krashen (2007), Priston (2005), Kim (2005) and Hoven (1999); Amiri provided supportive evidence and asserted the invaluable contributions of ICT & VLE to the domain. He concluded that language and literature learning is not restricted to classroom. It should extend to daily-life and real situations out of classroom. Amiri suggested also that both learners and teachers should persist in the continuous usage of the available technological devices as advantageous tools for literature learning and teaching.

An empirical study conducted by Arikan (2009) provided evidence that using visual materials to support literature classes had positive impact on learners' success in final achievement scores. It also influenced the classroom environment positively.

Those results had supported the view that using technology in literature learning can develop both learners' knowledge of literature, and knowledge of computer and internet technologies. It is obvious that the new technologies offer new educational possibilities that may be employed in teaching literature; for instance, the possibility of combining auditory and visual presentation interactively, and the prospects of access to literary journals, blogs and discussion forums.

Another empirical study was conducted in the college of education in Ankara, by Arikan (2008). The study revolved about applying internet technology into the teaching of American and British literatures through using "Internet Groups". The researcher aimed at exploring how students use the Internet Group in the learning of literature; and to discuss the effect of using Internet Group on learning literature. The participants were 132 prospective ELT teachers who did not had experience in studying literature through the medium of the internet.

The results indicated that this new medium got the learners' appreciation and met their needs and interests. The majority of the participants manifested satisfaction for using cyberspace, which facilitated their interaction and exposed them to massive literary input.

Literature, therefore, no longer confined to books; literary discourse has become available electronically; a fact which should be taken into consideration. This newly imposed fact necessitates acceptance of the challenge by including the new forms of literary discourse in recent plans and methodologies.

Chambers and Gregory (2006) asserted that "modern societies are moving from a word-and-print to an image-and-icon world and it would be pertinent for teachers to include elements of this image-and-icon world in their literature classes in order to engage their students". Building on this view, Yesilbursa (2012) had conducted an empirical study in teaching poetry to a group of Turkish prospective EFL teachers through multimedia materials. The researcher concluded that literary works can fit well within the currently popular communicative framework of teaching foreign languages; and that the use of audio-visual materials in teaching poetry had led to learners' enjoyment and better outcomes in learning.

A similar study conducted by Nurulhady (2010). He explored the possibilities in using audio-visual means and online media to improve students' involvement, enjoyment and creativity in English Drama class. The results indicated that using online media had a great impact on the learners' participation and creativity. It developed students' participation and promoted their creativity. In addition, using online resources helped greatly in upgrading the learners' understanding of literary elements of drama.

To conclude, it can be said that online media has become indispensible means to be adopted in teaching literature. It is a promising field worthy of attention and exploration; it must get the best from the courses designers and the educators' consideration.

Population and Sample

The targeted sample in this study included English learners enrolled in "American Literature" course at Hebron University during the first semester of the academic year 2014/2015.

This group represented the source of data about applying the BLA in teaching "The American Literature Course" specifically.

The learners in this group were taught traditionally for a half of the semester then, they were taught via the BLA for the remaining period of the semester. This group consisted of 26 learners as follows:

Table (2): Demographic data of the participants

Gender		Total	Level		Total
Male	Female		3rd year	4th year	
3	23	26	2	24	26

RESULTS

Introduction

This section provides statistical description of the collected data pertaining to the experimental part of the study: *Applying the BLA in learning the American Literature Course.* Two instruments were employed to collect the required data that may provide answers to the research questions; a questionnaire which was dedicated specifically to the experimental group; and the web-based instrument, the recordings of the online forum participations.

The results of this questionnaire will be compared with the forum recordings results to highlight the differences in the learners' performance. These differences in turn, would reflect the influence of using the BLA on the learners' learning through the experiment that had been conducted in learning the American Literature Course via the BLA. The comparison results in this sense represent the answers for the second research question concerning the influence of integrating the BL components in the traditional literature course "American Literature" on the learners' learning.

The questionnaire

The targeted sample of this questionnaire is 26 learners enrolled in the American Literature Course during the first semester of the academic year 2014/2015. The questionnaire and the demographic data related to the

participants were described previously. The researcher distributed the questionnaire and 25 of the participants had filled the required information. Below is the statistical information included in it:

Part (1): Personal information:

Table (12): Personal information of the participants:

Variables		Frequency	Percent	Missing values
Currently, I am studying in the	Third year	2	8.0	---
	Fourth year	23	92.0	
Do you have experience in learning by using blended learning approach?	Yes	10	40.0	---
	No	15	60.0	
Have you enrolled in any of the English literature courses?	Yes	18	72.0	---
	No	7	28.0	
If yes, number of courses	1	3	16.7	7
	2	4	22.2	
	3	3	16.7	
	5	3	16.7	
	6	3	16.7	
	8	1	5.6	
	9	1	5.6	

The collected data showed that all the participants are advanced learners, 92.0% are in their 4th academic year. It also showed that some of them 40.0% have an idea about learning via the BLA. Additionally, a considerable number of the participants 72.0% are familiar with literary courses and have enrolled at least in one literary course.

Part (2):
This part investigated the extent of using the BLA in Hebron University. To explore this issue, the researcher divided the collected data into three domains: the availability of CT for learners at home and university, the usage of CT by learners at home and university, and the employment of CT by the learners.

Availability of computer technology:
This domain had been explored through four items as shown in table 13:

Item	Yes	No	Total	Missing value
Do you have a personal computer of your own at home?	23 92.0	2 8.0	25 100.0	
Do you have access to Internet at home?	23 92.0	2 8.0	25 100.0	
Is access to internet available in the classroom?	4 16.6	20 83.3	24 100.0	1
Do you use computers in your English Literature Classes?	6 25.0	18 75.0	24 100.0	1

The resulted data showed that the vast majority of the participants 92.0% have their own personal computers and have access to internet at their homes. The collected data showed also that a considerable number of the participants 83.3% asserted the unavailability of internet in their classrooms, and 75.0% of the respondents asserted the lack of computer usage in their literature classes.

Usage of computer technology:
This domain had been explored through two items as shown in table (14):

How often do you use computers?		
Frequency		Percent
Once a week	2	8.0
2-3 times a week	4	16.0
4-5 times a week	6	24.0
6 or more times a week	13	52.0
Total	25	100

How many hours per week do you use Internet?		
Frequency		Percent
3-4	5	20.0
5-6	2	8.0
7-8	8	32.0
9-10	5	20.0
More than 11 hours	5	20.0
Total	25	100

The collected data showed that 76.0% of the participants used computers more than four times a week, and 72.0% used internet more than seven hours a week; a suitable frequency and period that may constitute a good base to be developed and harnessed in serving the learning-teaching process.

Employment of computer technology:
This domain has been explored through four questions as represented in table 15:

Do you use internet for learning purposes?			
Yes		No	
Frequency	Percent	Frequency	Percent
23	92.0	2	8.0

What do you use computers for?		
Item	Number %	Order
Doing assignments	22 88.0	1st
Materials preparation	20 80.0	2nd
Electronic mail	15 60.0	3rd
Entertainment	14 56.0	4th
Surfing internet	10	5th
Chat rooms	9	6th
Contacting teachers and classmates	7 28.0	7th
Games	7	7th

How many hours per week do you use the internet for learning purposes?		
	Frequency	Percent
Less than 2 hours	4	16.0
3-4 hours	7	28.0
5-6 hours	7	28.0
7-8 hours	4	16.0
9-10 hours	3	12.0
Total	25	100.0

What types of activities do you usually use?		
Item	Number %	Order
Text chatting	25 100.0	1st
On-line dictionaries	16 64.0	2nd
Quizzes	13 52.0	3rd
Web surfing	7 28.0	4th
Games	7	4th
Crosswords	6	5th
Puzzles	4	6th
Voice chatting	4	6th

The collected data showed that the vast majority of the participants 92.0% are using the internet for learning purposes; and that only 28.0% of the participants used the internet for learning purposes more than seven hours per week.

Regarding the targeted activities, the results showed that the superior usage was for entertainment. All the respondents reported that they used the internet for text chatting. In the second place came doing assignments 88.0%; followed by materials preparation 80.0%; then came online dictionaries 64.0%.

Part (3):
The attitudes of learners toward implementing CT in general (Items 1-4), and the BL in particular (Items 5-15), in English literature courses:

This part had been explored through 15 items as indicated in table16. The participants were asked to respond to items on a five Likert Scale from strongly disagree to strongly agree; below are the obtained results:

Table (16): Means, standard deviations of the attitudes of learners toward computer technology and Blended learning implementation in English literature courses arranged in order according to their importance.

No	Items	Mean	Std. Deviation	The degree
1	Computers are effective tools in language instruction	4.16	1.07	High
2	Technology must be used for language learning	4.12	0.88	High
3	Technology offers learners and teachers different options in learning and teaching	4.08	0.70	High
4	Technology facilitates the teaching- learning process	4.04	0.93	High
5	Blended learning promotes the learner's motivation	4.00	0.65	High
6	Blended learning approach helps in improving language skills	4.00	0.76	High
7	The learner feel more interested while using the blended learning approach	3.92	0.95	High
8	Using blended learning in English literature classes helps improving linguistic and multi-cultural knowledge and competence	3.80	0.87	High
9	Using blended learning in English literature classes can offer comfortable teaching- learning environment	3.76	0.83	High
10	Blended learning promotes the learner's achievement	3.76	0.66	High
11	Blended learning facilitates language acquisition	3.72	0.89	High
12	Blended learning can improve interactivity in English literature courses	3.64	0.76	Average
13	Using blended learning in English Literature classes can shift the teaching-learning process to learner-centered approach	3.60	0.91	Average
14	Blended learning can be used effectively in teaching literature courses	3.60	0.91	Average
15	Using blended learning in English Literature classes offers exposure to authentic materials and audience	3.56	0.82	Average
	total degree	3.85	0.48	High

(For detailed information by numbers and percentage see appendix A, table 4).

The results showed that the attitudes of the learners toward CT usage and implementing the BLA in literature classes were high in total degree by (mean=3.85). The first four items concerning CT implementation had gained a high degree of agreement among the respondents by (mean=4.16, 4.12, 4.8, 4.4) respectively.

Regarding the BLA implementation, the items 5 & 6 gained the highest degree of agreement among the respondents by (mean=4.0) for each; followed by the item number 7 by (mean=3.92). The items 15, 14, 13, respectively had attained the least degree by (mean=3.56, 3.60, 3.60) respectively.

Part (4):
The main obstacles impeding the implementation of the BL in English literature courses: This part had been explored through 15 items as indicated in table 17; below are the obtained results

Table (17): Means, standard deviations of the obstacles impeding the implementation of blended learning in English literature courses arranged in order according to their importance

No	Items	Mean	Std. Deviation	The degree
1	There is a lack of blended learning based facilities in literature courses	4.00	1.00	High
2	Computers are not available in English literature classes	3.88	1.33	High
3	Using computers in literature courses is energy and time consuming	3.40	1.22	Average
4	Educational courses designers and supervisors pay little attention to include blended learning in literature courses	3.32	1.18	Average
5	Teachers' levels of computer literacy are insufficient to implement blended learning in literature courses	3.24	0.93	Average
6	Teachers lack knowledge about blended learning methodology and implementation	3.20	1.04	Average
7	It is difficult to implement blended learning in literature classes	3.16	1.14	Average
8	Learners' levels of computer literacy are insufficient to implement blended learning in literature courses	3.16	0.94	Average
9	Instructional technology is too costly	3.16	1.11	Average
10	Bad connection of the internet impedes blended learning implementation	3.12	1.01	Average
11	I prefer traditional approaches of teaching	3.12	1.36	Average
12	There is scarcity of computer-based materials for literature courses	2.96	0.89	Average
13	I am not familiar with blended learning technology	2.92	1.15	Average
14	Teachers lack competence to develop computer-based materials for literature courses	2.92	1.04	Average
15	Computers cannot be used for different language skills and activities	2.44	1.26	Average
	total degree	3.20	0.55	Average

(Detailed information by numbers and percentage is provided in appendix A, table 5).

The results showed that the first three items gained the highest degree as the main obstacles impeding the BL implementation in English literature classes by (mean=4.00, 3.88, 3.40) respectively. Meanwhile, the items 15, 14, 13, attained average degree as obstacles impeding the BL implementation by (mean=2.44, 2.92, 2.92) respectively.

Part (5):
The main suggestions to be taken into consideration to include the BL in English literature courses:
This part had been explored through 8 items as indicated in table 18; below are the obtained results:

Table (18): Means, standard deviations of the suggestions to be taken in consideration to include Blended learning in English literature courses arranged in order according to their importance:

No	Items	Mean	Std. Deviation	The degree
1	It is necessary to provide EFL teachers with adequate facilities to implement blended learning	4.32	0.85	High
2	Workshops and meetings on how to implement blended learning in EFL courses can help its realization	4.16	0.69	High
3	Providing EFL teachers with enough class time to implement blended learning is an important requirement	4.04	0.89	High
4	Updating EFL teachers' knowledge about new blended learning software ensures development	4.00	0.76	High
5	Blended learning must receive more financial support	4.00	0.82	High
6	Cooperative efforts of EFL teachers in blended learning materials production can lead to success	3.96	0.93	High

7	Including blended learning in teacher training educational programs can increase the implementation considerably	3.92	0.81	High
8	Awareness-raising programs and sessions on the uses and benefits of blended learning can lead to more acceptance of it	3.92	0.86	High
	Total degree	4.04	0.58	High

(Detailed information by numbers and percentage is provided in appendix A, table 6).

The results showed that the raised suggestions had obtained high total degree of agreement among the respondents. All of the suggestions had gained high degree of approval amongst the respondents by (mean ranged from 4.32 to 3.92).

The forum recordings:
This section is an analysis of the forum recordings over the period of the BL program. The aim of this analysis is to provide authentic supportive evidence which could be reliable indicative proof regarding the influence of using the BLA on the learners' learning. The resulted information could also provide evidence concerning the degree of acceptance among the learners toward using the BLA.

The first criterion that could be an indicative sign is the count of access operations to the course and the targeted activities during access. These could indicate the scope of interactivity and interest with the experience. The other criterion is the results of the learners' participations content analysis. These participations on the forum can provide indicative data about the learners' performance quantitatively and qualitatively; in addition, an included evidence of positive or negative attitudes toward the experience.

Access to the course

Table (19): Total access operations to the course over the period of the blended learning program All activity (all roles)

Period ending (Week)	Guest	Student	Teacher	All
27 December 2014	18	896	111	1025
20 December 2014	0	1077	0	1077
13 December 2014	16	515	18	549
6 December 2014	97	1038	6	1141
29 November 2014	42	966	53	1061
22 November 2014	11	627	34	672
15 November 2014	133	1822	146	2101
8 November 2014	228	2757	8	2993
1 November 2014	0	47	0	47

Students' total access operations: 9745
Teacher's total access operations: 376
The recorded data showed that the students had performed 9745 access operations in total over the period of the program duration. These access operations were ranged from 515 access operations at minimum to 2757 at maximum per week. This enormous number of access operations to the course activities can reflect evidently the extent of interest and interactivity of the learners with the new mode of learning.

The data showed also that the teacher had performed 376 access operations over the period of the program duration; an indicative sign reflecting the extent of teacher-student interactivity through the program.

The targeted activities
The activities included in the plan to be practiced online consisted of reading texts; watching videos; reviewing references; discussions on the forum; doing quizzes and assignments; and comments and suggestions. Table 20 below presents details about the targeted activities by number of logs for each activity per week and the total logs over the period of the program duration.

Table (20): Numbers of logs and the targeted activities *(Original version about the recorded logs in appendix B)*:

Week	Reading text	Watching videos	Reviewing references	Discussion on the forum	Quizzes & Assignments	Comments & Suggestions
1	108	92		1209	318	72
2	65	52	591	564	266	75
3	66	49	406	547	548	
4	40	16	314			
5	40	37	303		440	
Total	319	246	1614	2320	1572	147
Total logs	**6218**					

The recorded data showed a total of 6218 access operations by the students to the course activities during the program. The access operations were distributed as shown in the above table. 319 logs for reading texts; 246 for watching videos; 1614 for reviewing references; 2320 for discussions on the forum; 1572 for doing quizzes and assignments; and 147 for comments and suggestions.
The most targeted activity was the forum discussions by total logs=2320; followed by reviewing references by total logs=1614. The least targeted activities were comments and suggestions by total logs=147; followed by watching videos by total logs=246.

Content analysis of learners' participations
Because of the difficulty involved in analyzing the massive amount of learners' participations, the researcher decided to select a systematic random sample from the participants in order to analyze their posts during the period of the program. Four participants were selected as a sample. Their posts were collected through three stages; the first week, the third week, and the fifth week. Afterwards, contrastive analysis had been conducted to monitor the changes in their performance through the three stages. Table 21 below presents the results of the text content analysis of the learners' online participations:

Table (21): Content analysis of the learners' participations:

Week	Participant	Total words count	Total unique words	Number of sentences	Number of paragraphs	Hard words	Lexical density
	1st						
1st		111	66	7	1	4	59.46
3rd		138	94	6	2	14	68.12
5th		150	92	5	3	11	61.33
	2nd						
1st		33	26	1	1	3	78.79
3rd		550	265	19	3	27	48.18
5th		684	280	25	8	42	40.94
	3rd						
1st		54	41	3	1	4	75.93
3rd		141	98	6	5	16	69.50
5th		447	170	18	5	22	38.03
	4th						
1st		48	34	2	1	1	70.83
3rd		381	186	13	5	27	48.82
5th		835	328	32	7	58	39.28

(A version of the learners' participations is provided in appendix B)

The results from learner participation analysis showed remarkable quantitative and qualitative development in the learners' performance standards. As shown through table 21 by numbers and percentage relying on the determined criteria, there were significant variations in the participants' production from one stage to the other. The data showed evidently that the learners' production had developed greatly in quantity and quality.

CONCLUSION

Modern societies are living in the era of global technology; to the extent that technology components became an inseparable feature from the daily-life landscape. Owing to its infinite advantages and potentials in serving societies, technology imposed itself as an essential and indispensable requirement for evolution and development in all domains and activities.

No doubt, the educational domain is one of the essential pillars of any development within the society in which CT should be utilized effectively to keep pace with the era demands. CT certainly can contribute extremely to the educational domain. In spite of this fact, it is not utilized effectively in the Palestinian educational system, particularly the context of Hebron University, the target of this study.

This study actually came as a stride on the track of filling the gap in this issue. The study had investigated the extent of using CT at Hebron University. Strikingly, the study had provided evidence that in spite of the advanced technological infrastructure, CT is not tapped efficiently in serving the teaching-learning process, particularly in learning English language and English literature.

The study also explored the attitudes of the learners toward the usage of CT and the contributions of the BLA in literature classes. The vast majority of the learners had expressed positive attitudes and high degree of agreement upon the enormous benefits of CT and the BLA in English literature classes. The most prominent obstacles they raised were related to the unavailability of computers in their classes, and the lack of instructional technology-based facilities in literature courses.

However, the experimental part of the study had proved aptly the advantageous contributions of CT and the BLA in particular. It also manifested the positive attitudes of the participants. They revealed significant changes in their learning behavior and achievement. The experiment results also have provided clear evidence concerning the effectiveness of the BLA in uplifting the teaching-learning process and improving its outcomes in quantity and quality. Which in turn, based on the splendid success of the experiment prompted adopting the BLA in teaching the American Literature course beginning from the second semester of the academic year 2014/2015.

REFERENCES

Allen, E. & Seaman, J. (2010). Class Differences: Online Education in the United States. *Babson Survey Research Group.*

Amiri, E. (2012). A Study of The Application of Digital Technologies In Teaching And Learning English Language And Literature. *International Journal of Scientific & Technology Research.* Vol 1, Issue 5, June 2012.

Arikan, A. (2009). Visual Materials in the Teaching of Literature: a Short Story Application. Ondokuz Mayis University. *Journal of Education 01/2009.*

Arikan, A. (2008). Using Internet Groups in the Learning of Literature. *H. U. Journal of Education* 34: 19-26 [2008].

Arikan, A. (2005). An Evaluation of Literature Curriculum in H.U. English Language Teaching Department. *Hacettepe University Journal of Education*, 29, 40-49.

Babu M, Sameer (2009). One Plus Two Is Not Always Three: A Look Into the Merits of Blended Learning. *Mytrei College, University of Delhi, Delhi 2009.* http://www.slideshare.net/SameerM3/blended-learning-a-new-strategy

Chambers, E., & Gregory, M. (2006).Teaching and Learning English Literature. London: *Sage Publications Ltd.*

Davidson, C. & Tomic, A. (1994). *ELT Journal* 48, 3, 205-214.

Delacey, B, J. & D. A. Leonard. (2002). Case study on technology and distance in education at the Harvard Business School**.** *Educational Technology & Society* 5 (2) 2002. ISSN 1436-4522.

Driscoll, M. (2002). Blended Learning: Let's Get Beyond the Hype. *IBM Global services.*

Duff, A., & Maley, A. (2007). *Literature.* Oxford: Oxford University Press.

Dziuban, D; Hartman, L; Moskal, D. (2004). Blended Learning. Volume 2004, Issue 7. March 30,2004.

Edwards, C. & Fritz, JH. (1997). Evaluation of three Educational Online Delivery Approaches. *Mid-South Instructional Technology Conference Proceedings.* (2nd Murfreesboro, TN, April 6-8 1997).

Fahimi, M; Motallebzadeh, Kh. & Sazegar, Z. (2011). The Effect of E-mailing on Vocabulary Retention of Iranian Lower Intermediate EFL Learners. *Journal of Language Teaching and Research,* Vol. 2, No. 6, pp. 1385-1391, November 2011.

Graham, C.R. (2004). Blended Learning Systems: Definition, Current Trends, and Future Directions. San Francisco, CA: Pfeiffer Publishing.

Grgurović , M. (2011) Blended Learning in an ESL Class: A Case Study.*CALICO Journal,* 29 (1) , p- p 100-117.

Harriman, G (2004). What is Blended Learning? *E-Learning Resources. Gary Harriman.Com.*
Itmazi,J. (2011). E-Learning Systems and Tools, An Arabic Text Book by Dr. Jamil Itmazi. https://books.google.ps.
Jain, M. (2012). ICT as an Aid in Teaching English Literature and Bridging the Digital Divide. *Bhatter College Journal of Multidisciplinary Studies*, Vol. 2, 2012.
Keshta, A.S.; Harb, I.I. (2013). The Effectiveness of a Blended Learning Program on Developing Palestinian Tenth Graders' English Writing Skills. *Education Journal.* Vol. 2, No. 6, 2013, pp. 208-221.
Kilickaya, F. & Krajka, J. (2010). Comparative Usefulness of Online and Traditional Vocabulary Learning. *TOJET: The Turkish Online Journal of Educational Technology* – April 2010, volume 9 Issue 2.
Krause, K (2008). Blended Learning Strategy. Griffth University**.** January 2008- Document number 2008/0016252.
Lazar, G. (1993) Literature and Language Teaching: A guide for Teachers and Trainers. Cambridge: Cambridge University Press.
Levy, M. (1997). CALL: Context and Conceptualization. Oxford: Oxford University Press.
Mackey, A. & Susan M. Gass. (2005). Second Language research, Methodology and Design. *TESL- EJ Top*, 9 (3). December 2005.
Meloni, C. (1999). The Internet in the Classroom. *ESL Magazine*, 1, 1, 10-16.
Michael, B; Horn and Heather Staker (2011). The Rise of K-12 Blended Learning. *Innosight Institute*, New York.
Miyazoe, T. & Anderson, T. (2009). Learning Outcomes and Students' Perceptions of Online Writing: Simultaneous Implementation of a Forum, Blog, and Wiki in an EFL Blended learning Setting. *An International Journal of Educational Technology and Applied Linguistics.* Volume 38. Issue 2. June 2010.
Nurulhady, E.F. (2010). Teaching Drama With A Combination of Regular and Online Course: The Use of Online Media in Teaching Literature. http://eprints.undip.ac.id/34501/1/.
Oblender. Th. (2002). A Hybrid Course Model: One Solution to the High Online Drop-Out Rate. *Learning and Leading with Technology*, Volume 29 Number (6). 42-46.
Parkinson, B., & Reid Thomas, H. (2000). Teaching Literature in a Second Language. Edinburgh: Edinburgh University Press.
Reis, L. (1995). Putting the Computer in its Proper Place- Inside the Classroom. *English Teaching Forum*, Vol 33 No 4, 28-29.
Rossett, A.; Felicia D.; Rebecca V,F. (2003). Strategies for Building Blended Learning. *Learning Circuits*, ASTD. June 30, 2003.
Sivert, S. & Egbert,J. (1995). Using A Language Learning Environment Framework to Build A Computer-Enhanced Classroom. College ESL Vol 5 No 2.
Soltani, N. & Tabatabaei, O. (2012). The Impact of Blended Online Learning on Iranian EFL Learners' Vocabulary Achievement. *ELT Voices, India.* Vol 2, Issue 5. October 2012.
Teeter, T. (1997). Teaching on the Internet. Meeting the Challenge of Electronic Learning. *ERIC No. ED 418957.*
Warschaure,M. & Healey, D. (1998). Computers and Language Learning: an overview. *Lang. Teach.* 31, 57-71. Printed in the United Kingdom © 1998 Cambridge University Press.
Yesilbursa, A. (2012). Teaching Poetry With Multimedia Materials: Tennyson's "The Lady of Sharlot". *Novitas-Royal* (Research on Youth and Language), 6 (2), 154-168. 2012.