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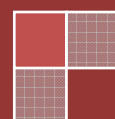
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Contact Address:
Prof. Dr. Aytekin İŞMAN
TOJET, Editor in Chief
Sakarya-Turkey

Message from the Editor-in-Chief

Dear Colleagues,

The Turkish Online Journal of Educational Technology (TOJET) is a refereed international online journal sponsored by Sakarya University and other international universities (Ohio University, Governor State University, Georgia State University and others). The main mission of TOJET is to diffuse how to use technology in education all over the World.

TOJET is interested in academic articles on the issues of educational technology. The articles should talk about using educational technology in classroom, how educational technology impacts learning, and the perspectives of students, teachers, school administrators and communities on educational technology. These articles will help researchers to increase the quality of both theory and practice in the field of educational technology.

The guest editors of this issue were Assoc. Prof. Dr. Betül Czerkawski, Director of Educational Technology Programs, The University of Arizona- South Campus Science and Technology Park and Assistant Prof. Dr. Christopher Johnson, Educational Technology, The University of Arizona South, ISTE SPA Co-Coordinator, Council for the Accreditation of Educator Preparation. TOJET thanks and appreciate the guest editors and the editorial board who have acted as reviewers for one or more submissions of this issue for their valuable contributions. TOJET's reviewers are drawn quite widely from all over the world.

TOJET, Sakarya University-Turkey and AIC at Chicago will organize the 14th International Educational Technology Conference (IETC 2014) between September 03-05, 2014 at AIC in Chicago, USA. The web page of IETC is "www.iet-c.net".

Call for Papers
TOJET invites article contributions. Submitted articles should be about all aspects of educational technology and may address assessment, attitudes, beliefs, curriculum, equity, research, translating research into practice, learning theory, alternative conceptions, socio-cultural issues, special populations, and integration of subjects.

The articles should also discuss the perspectives of students, teachers, school administrators and communities. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJET. All authors can submit their manuscripts to tojet.editor@gmail.com for the next issues.

July 01, 2014
Prof. Dr. Aytekin İŞMAN
Editor-in-Chief of TOJET

Editorial Board

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A FEASIBILITY STUDY OF USING ICT IN IRANIAN SECONDARY SCHOOLS: THE CASE OF TEHRAN PROVINCE

Kourosh FATHI VAJARGAH
Professor of Curriculum Studies
School of Education, Shahid Beheshti University
PO Box 1983963113, Tehran. Iran
Fax: 00982122431688
Tel: 00989121480486
E-mail:kouroshfathi@hotmail.com

Ayat SAADATTLAB
PhD Candidate in Higher Education Development
School of Education, Shahid Beheshti University
PO Box 1983963113, Tehran. Iran
Fax: 00982122431688
Tel: 00982129902418
E-mail: saadattalab2009@gmail.com

ABSTRACT
This research presents the results of a feasibility assessment on implementing ICT in Tehran high schools. Mixed method research (both qualitative and quantitative) was employed and due to the nature of research, data collection included two stages: library and field study. Using the cluster method with 362 subjects, data was collected using a researcher-made questionnaire with 0.86 Alpha reliability coefficients, and then analysis was performed at two levels, using descriptive and inferential statistical approaches (frequencies, T-test and priority setting by Li-Hi test).

The results demonstrate that teachers agree on the types and features of ICT. In addition, they believe that the current status of resources, facilities and conditions for implementing ICT in schools is insufficient. The teachers confirmed the facilitating factors of ICT applications in secondary schools, which are also discussed in this paper.

Keywords: ICT application; ICT literacy; secondary school teacher's competencies; ICT feasibility study

INTRODUCTION
In the new millennium, advances in information and communication technology (ICT) have enabled its rapid proliferation throughout the world, and it now affects various aspects of human life. ICT helps expand learning opportunities, access to educational resources, expedite and facilitate the education process (Abbasi & Jalali, 2004; Yaghma, 2001). Training is the first and most important activity influenced by this constantly developing technology (Kasal, 2007). Altering the style of learning by using ICT is more than using computers in the classroom. Real change occurs when ICT broadens the thinking horizon of trainers and trainees, provides new skills and connects them to a world of new ideas and learning resources (Fathi Vajargah & Sobhani Nejad, 2007; Ontario, 2001). Garrison and Anderson (2003) acknowledged that the use of information and communication technology is inevitable for everyone to achieve the objectives of qualitative learning.

Preparing teachers with appropriate ICT application training and development is an important factor in the successful introduction of ICT into schools. However, this preparation should not be limited to conventional computer literacy (Attaran, 2006) nor teachers, students need to be prepared to successfully live and work with technological tools and they require information management strategies and technical skills (Cola, 2001).

Nowadays, society expects education systems to offer a universal education that encourages creativity and innovation, not restrict the teaching and learning context to textbooks, the class teacher or school environment. The developments in ICT have paved the way to achieve this (Frazinpour, 2004).

Currently, the main issue is not whether ICT should be used in schools, but how better to utilise ICT in secondary schools. In other words, what is the extent of possibilities in using ICT in secondary schools? Therefore, this research attempts to investigate the conditions, facilities and resources (human, financial, and

environmental) of different domains of ICT in secondary schools. Finally, the facilitating factors and barriers to exploiting this technology are explored.

ICT Education: Iranian Context
During the past two decades, computers have been used for administrative purposes in some Iranian schools; especially schools in cities such as Tehran and non-profit schools. After 1990, the Ministry of Education initiated the development of educational information technology, gradually designing and implementing comprehensive informatics systems. The ministry's objective was to establish Management Information Systems (MIS), automated operational procedures and modern information tools for planning, implementing and monitoring the expansion of qualitative and quantitative educational activities, all of which were the drivers to introduce ICT into the education system in Iran (Ebadi, 2005). Therefore, the Ministry of Education, together with the private sector, implemented several ICT projects to apply these new technologies in schools and other areas of the educational system.

One of the significant indicators of ICT application development at schools is computer-student ratio. According to reports published in 2006, this ratio has been increased from 1:300 to 1:48 at secondary schools, whereas, this ratio is under 10 in European countries (Council of Strategic ICT, 2007). The Iranian government's ICT strategic plans now include ICT application development in education and actions to improve the competency of Iranian authorities to transition from traditional education to e-learning and the provision of computer skills to students. Accordingly, the Iranian IT community involved with institutions of education is positively affected by ICT developments and the overall improvements in the Ministry of Education of Iran (Ayti, 2006). Communication technologies, such as the cassette recorder, video and TV, and more recent word processors and internet are considered important tools in collecting, recording and presenting data in different ways (Herne, Jessel, Griffiths, 2001; Mohammadi, 2002; Raees Dana, 2002).

ICT in education is more than just hardware: It is a culture, a program, an active educational process that defines the content of modern education. To be effective however, it needs to be a profitable culture, one that exploits the utility of ICT tools in educational environment (Ebadi, 2004).

Effective use of ICT is accompanied by special advantages for the student, contributing to the student learning process and increasing their motivation. In addition, it fosters student competition and enhances their self-confidence and self-esteem (Williams, Nicholas & Jamali, 2006). Guttman (2001) stated that high school curriculum has adapted to accommodate ICT educational aims and Lockard and Abrams (2001) acknowledged that while some educators still resist ICT educational tools, the majority commit to it. Once educators believe in the positive effect of ICT to students' pedagogical achievements, they readily adopt its use in teaching and research (Van Melle, 2005).

Previous research has suggested that lack of skill and preparation of teachers are the most important barriers to the adoption of ICT in education, whereas success has resulted from serious and purposeful efforts to train teachers (Attaran, 2004; Hakkarainen et al., 2000; Orhun, 2004; Williams, Wilson, Richardson, Tuson, & Coles, 1998).

Davis, Bagoozy and Varsaw (1989) in their research showed that the technology acceptance model and reasoned action theory indicated the mental implication of students: The effectiveness and usefulness of technology affected students' decision to use technology, while students' mental interpretation of the effort of using the technology had lesser affect on their decision to use it.

The study by Hu, Clark and Ma. (2003) indicated that there was a meaningful relationship between the use of computers and the Internet in training teachers and the learning progress of students. Teachers were more successful when using computers and accessing the network, which correlated to a significant progress in students' learning and positive reinforcement of the teachers' decision to utilise ICT.

Ghasemi-Nejjad (2005) reported that to accommodate ICT in the teaching environment, some changes were required; Curriculum structure, reforms to existing lessons, new content for lessons, changes to performance measurement tools and staff training. It may also be necessary to change the way staff participate in the decision-making process and provide feedback on the current contribution to teaching and learning made by technology and its future challenges.

RESEARCH QUESTIONS
Main Question:
To what extent is it the possible to use ICT developments in secondary schools in Tehran?
Specific Questions:
 (1)   What areas of ICT are applicable to secondary schools?
 (2)   What conditions, ICT equipment and resources (human, financial, material, and environmental) are currently available at secondary schools?
 (3)   What conditions, ICT equipment and resources (human, financial, material, and environmental) are required at secondary schools?
 (4)   What are the main barriers to using ICT for teaching and learning at secondary schools?
 (5)   What are the main factors that facilitate the use of ICT for teaching and learning at secondary schools?

RESEARCH METHODOLOGY
To meet the study aims, which were to examine the feasibility of using ICT in secondary schools in Tehran, the researchers selected the descriptive-survey research methodology, where they assessed the status quo and present situation with respect to the feasibility of using ICT and surveyed teachers opinions on the feasibility of using ICT in secondary schools.

The research population included 6,431 high school teachers (male) in Tehran. Cluster sampling was used to select the research sample from the 19 educational districts of Tehran, divided into five geographical categories of north, south, east, west, and centre, with one educational district randomly selected later. (The breakdown of the selected districts is shown in Table 1.)

Table 1. Selected educational districts from cluster sample.

Row	Category	Educational Districts
1	North	1
2	South	15
3	Centre	6
4	East	14
5	West	9

Data collection employed a researcher-made questionnaire, with 67 questions designed for the Likert scale, which exhibited 0.86 Alpha reliability coefficients. To develop the questionnaire, the items were designed according to the research objectives and theoretical framework on five issues: The applicability of ICT features, the present situation of ICT use, desired conditions for ICT use, obstacles to ICT use, and facilitating factors in using ICT. The questionnaire was tested for validity by seven ICT experts, following which some items were modified.

Data analysis was done at two levels of descriptive and inferential statistic interpretations (frequencies, T-test and priority setting by Li-Hi test) and the significance level set for this research was $\alpha = 0.05$.

FINDINGS
The teachers' responses in relation to the feasibility of applying ICT in Tehran secondary schools (shown in Table 2) all have a mean above two and achieved a value for *t* with significance level of $\alpha = 0.05$, which suggests that from the teachers point of view, all the ICT items are applicable in secondary schools and are crucially important.

Table 2. Results of t-test for the most applicable area of ICT in secondary schools.

	Indicator				Test Value = 2		
	Item	Frequency	Mean	Standard Deviation	t	df	Sig. Level
1	Accessibility of digital library and global Internet information in secondary schools.	362	2.5880	.57697	19.130	361	./…
2	Feasibility of using website and email to announce the exam programs.	362	2.6160	.53578	21.876	361	./…
3	Providing the facilities for	362	2.4724	.60061	14.964	361	./…

	teachers to be aware of their promotion situation via a website or email.						
4	Providing the facilities for teachers to use website or email for official correspondence.	362	2.6796	.52849	24.465	361	./…
5	Producing digital educational resources (book, pamphlet, slide, problem solve, newspaper etc.) for students.	362	2.4282	.61521	13.242	361	./…
6	Providing the facilities for teachers to use website or email for the result of transfusion.	362	2.5249	.57239	17.446	361	./…
7	Providing the facilities for teachers to use website or email for assigning homework and receiving the solution from students.	362	2.3260	.58023	10.689	361	./…
8	Providing the facilities for student's parents to use website or email for checking the curriculum situation and exams results of their children.	362	2.6630	.54920	22.968	361	./…
9	Providing the facilities for student and their parent to communicate with school administrator and teachers.	362	2.6878	.49855	26.251	361	./…
10	Providing the facilities for school administrator and teachers to use website or email to communicate with administrator and teachers of other schools for discourse.	362	2.7541	.47403	30.269	361	./…
11	Providing the facilities for holding the online exams through Internet or local network of the school.	362	2.6436	.53423	22.923	361	./…
12	Assigning or encouraging students to use software related to specific courses or used for doing calculations better, solving the problem, drawing the shapes, typing and …	362	2.4365	.62947	13.193	361	./…

The overall results (see Table 3) to questions on the available conditions, ICT equipment and resources (human, financial, material, and environmental) in secondary schools, show all the items have a mean below two, have achieved a value for t with significance level of $α= 0.05$, and that from a teachers point of view, the current situation—conditions, ITC equipment and resources—is not suitable for using ICT in the surveyed secondary schools.

To use ICT effectively in the classroom, a certain level of ICT infrastructure, equipment and resources (human, financial, material, and environmental) is required in schools. What can be inferred from the teachers' responses is that they believe that the present conditions, equipment and resources in secondary schools are inadequate for the application of ICT.

Table 3. Results of t-test for current conditions, equipment and resources for using ICT in secondary schools.

	Indicator				Test Value = 2		
	Item	Frequency	Mean	Standard Deviation	t	df	Sig. Level
1	Access to digital libraries & information on the web.	362	1.1685	.49575	-31.912	361	./…
2	Careful planning of computer workshops in schools.	362	1.2431	.54850	-26.255	361	./…
3	Providing appropriate scientific & educational magazines at computer workshops in schools.	362	1.2155	.49706	-30.030	361	./…
4	To make the computer workshops equipped to various types of computer hardware suitable for teachers and students.	362	1.2680	.55950	-24.894	361	./…
5	Availability of classroom equipped with PC projectors for teachers' presentations.	362	1.3149	.55225	-23.603	361	./…
6	Preparing teachers to use computer in workshops at schools.	362	1.2348	.52905	-27.519	361	./…
7	Providing digital copier material equipment in schools.	362	1.3591	.57490	-21.210	361	./…
8	Facilities for teachers to use the Internet in schools.	362	1.3039	.58744	-22.547	361	./…
9	Availability of inexpensive Internet for teachers and students.	362	1.2486	.53577	-26.683	361	./…
10	Schools have access to necessary budgets for the development of ICT.	362	1.1989	.50941	-29.921	361	./…
11	Expansion of accessible communication networks.	362	1.3895	.60028	-19.350	361	./…
12	Providing personal web sites for teachers.	362	1.1740	.48819	-32.191	361	./…

The overall results from the questions about the required conditions, ICT equipment and resources to use ICT effectively in schools (shown in Table 4), show all the items have a mean above two and achieved a value for *t* with significance level of α= 0.05. From the teachers point of view, the results indicate that significant improvements to the conditions, ICT equipment and resources are required to apply ICT effectively in teaching and learning.

Table 4: Results of t-test for the required conditions, IT equipment and resources to use ICT at secondary schools.

	Indicator				Test Value = 2		
	Item	Frequency	Mean	Standard Deviation	t	df	Sig. Level
1	Access to digital libraries & information on the web.	362	1.1685	.49575	-31.912	361	./…
2	Careful planning of computer workshops in schools.	362	1.2431	.54850	-26.255	361	./…
3	Providing appropriate scientific & educational magazines at computer workshops in schools.	362	1.2155	.49706	-30.030	361	./…
4	To make the computer workshops equipped to various types of computer hardware suitable for teachers and students.	362	1.2680	.55950	-24.894	361	./…

5	Availability of classroom equipped with PC projectors for teachers' presentations.	362	1.3149	.55225	-23.603	361	./…
6	Preparing teachers to use computer in workshops at schools.	362	1.2348	.52905	-27.519	361	./…
7	Providing digital copier material equipment in schools.	362	1.3591	.57490	-21.210	361	./…
8	Facilities for teachers to use the Internet in schools.	362	1.3039	.58744	-22.547	361	./…
9	Availability of inexpensive Internet for teachers and students.	362	1.2486	.53577	-26.683	361	./…
10	Schools have access to necessary budgets for the development of ICT.	362	1.1989	.50941	-29.921	361	./…
11	Expansion of accessible communication networks.	362	1.3895	.60028	-19.350	361	./…
12	Providing personal web sites for teachers.	362	1.1740	.48819	-32.191	361	./…

The overall results for barriers to using ICT in secondary schools (shown in Table 5), revealed all the items have a mean above two, achieved a value for *t* with significance level of α= 0.05, and from the teachers point of view, the items are significant barriers to using ICT successfully in secondary schools and need to be addressed.

Table (5): Results of t-test for main barriers to ICT use in secondary schools.

| | Indicator | | | | Test Value = 2 | | |
	Item	Frequency	Mean	Standard Deviation	t	df	Sig. Level
1	The lack of computer hardware knowledge of teachers and students.	362	2.4006	.60221	12.655	361	./…
2	Not holding introductory computer classes for teachers and students.	362	2.5442	.55148	18.775	361	./…
3	The lack of motivation to use computers in educational issues among teachers.	362	2.5663	58350	18.466	361	./…
4	Teachers' lack familiarity with software helpful in teaching.	362	2.6022	.53342	21.480	361	./…
5	Teachers and students lack familiarity with the Internet and its use.	362	2.5580	.56510	18.788	361	./…
6	Teachers lack of belief about the impact of ICT to improve education.	362	2.4392	.65560	12.747	361	./…
7	The lack of morale and cooperative motivation in schools staff to embrace the new environment.	362	2.5718	.55359	19.653	361	./…
8	The lack of facilities such as digital copiers, CD copiers etc. in schools.	362	2.4144	.58571	13.460	361	./…
9	The lack of financial resources to buy computers, PC projectors and	362	2.6713	.54157	23.583	361	./…

	other necessities.						
10	The lack of classrooms and sites equipped with computers, PC projector and other necessities.	362	2.6492	.52748	23.416	361	./…

The overall responses from teachers on the factors that may facilitate the use of ICT in secondary schools (shown in Table 6) all have a mean above two and achieved a value for *t* with significance level of α= 0.05. The results show from the teachers' point of view that the items mentioned as factors to facilitate the use of ICT in secondary schools are crucial and expected to be effective.

Table 6: Results of t-test for factors that facilitate the application of ICT at secondary schools.

	Indicator				Test Value = 2		
	Item	Frequency	Mean	Standard Deviation	t	df	Sig. Level
1	Holding training courses on windows operating system.	362	2.6050	.54826	20.995	361	./…
2	Holding training courses on an introduction to internet.	362	2.6657	.50084	25.291	361	./…
3	Holding training courses on software such as Word, PowerPoint, Excel, Access etc.	362	2.6022	.54371	21.073	361	./…
4	Holding training courses on email.	362	2.5414	.54156	19.022	361	./…
5	Holding training courses on online database and websites.	362	2.6878	.48731	26.856	361	./…
6	Providing correspondence instruction in different areas of ICT for teachers and students.	362	2.5801	.56239	19.626	361	./…
7	Providing financial support and enough ICT budget for teachers.	362	2.6575	.53551	23.359	361	./…
8	Propensity of students to attend the computer lab and use its equipment.	362	2.6630	.49059	25.712	361	./…
9	Teachers' familiarity with software which can helpful in teaching	362	2.7928	.42583	35.423	361	./…
10	Adequate budget to equip classrooms with necessary ICT hardware.	362	2.7956	.45542	33.238	361	./…
11	Positive morale and cooperative motivation of school staff to embrace the new environment.	362	2.7707	.43391	33.795	361	./…
12	Careful planning of computer workshops in schools.	362	2.7514	.46371	30.830	361	./…
13	Teachers and students have a reasonable level of computer knowledge.	362	2.7459	.44851	31.640	361	./…
14	Computer workshops are equipped with computer hardware required for teachers and students.	362	2.7210	.47316	28.992	361	./…

Table 7: Ranking the research items (areas for ICT, current situation of ICT, required conditions for ICT, barriers to ICT, and factors facilitating ICT).

Questionnaire Text Research Questions	1	2	3	4	5	6	7	8	9	10	11	12	13	14
The ICT areas most applicable to secondary schools	2	1	1	2	2	1	4	2	2	1	4	3		
Current conditions, ICT equipment and resources in secondary schools	4	3	4	3	1	3	1	2	3	4	1	4		
Required conditions, ICT equipment and resources to use ICT in secondary schools	2	2	1	1	4	3	4	1	1	1	3			
The barriers to using ICT in secondary schools	4	2	2	2	2	2	2	4	1	1				
Factors that facilitate the application of ICT in secondary schools	3	3	4	4	2	4	3	3	1	1	1	1	1	2

The factors were ranked using the Li Hi method (results are shown in Table 7), based on the teachers' responses to the survey questions. The highest and lowest ranked items are listed below.

High Ranking Items—ICT Areas Most Applicable to Secondary Schools
- Providing a website and emails to announce the exam programmes
- Providing a website or email facilities to announce teachers' promotions
- Providing website or email facilities for teachers to use for the result of transfusion
- Providing website or email facilities for school administrator and teachers to communicate with administrator and teachers of other schools

Low Ranking Items—ICT Areas Most Applicable to Secondary Schools
- Providing facilities for holding exams online, through the Internet or local network of the school
- Providing website or email facilities for teachers to assign homework and receive solution from students

High ranking items—Current Conditions, ICT Equipment and Resources in Secondary Schools
- Expansion of accessible communication networks
- Providing digital copier materials and equipment in schools
- Availability of classrooms equipped with PC projector for teachers' presentation

Low ranking items—Current Conditions, ICT Equipment and Resources in Secondary Schools
- Providing appropriate scientific and educational magazines at computer workshops in schools
- Providing personal web sites for teachers
- Access to necessary budgets for the development of ICT
- Access to digital libraries and information on the Internet

High Ranking Items—Required Conditions, ICT Equipment and Resources to Use ICT in Secondary Schools
- Availability of inexpensive Internet for teachers and students
- Equip computer workshops with required computer hardware for teachers and students
- Access to Internet facilities for teachers in schools
- Access to necessary budgets for the development of ICT
- Expansion of accessible communication networks
- Provide appropriate scientific and educational magazines at school computer workshops

Low Ranking Items—Required Conditions, ICT Equipment and Resources to Use ICT in Secondary Schools
- Providing digital copier and equipment in schools
- Availability of classrooms equipped with PC projectors for teachers' presentation

High Ranking Items—Barriers to Using ICT in Secondary Schools
- Lack of classrooms and sites equipped with computers, PC projectors and other necessary facilities
- The lack of financial resources to buy computers, PC projectors and other necessities

Low Ranking Items—Barriers to Using ICT in Secondary Schools
- Lack of facilities such as digital copier, CD copier and other equipment in schools
- The lack of computer hardware knowledge of teachers and students

High Ranking Items—Factors That Facilitate the Application of ICT in Secondary Schools
- Teachers and students have a reasonable level of computer knowledge
- Adequate budget to equip classrooms with necessary computer hardware
- Positive morale and cooperative motivation of school staff to embrace the new environment
- Careful planning of computer workshops in schools
- Teachers' familiarity with software which can helpful in teaching

Low Ranking Items —Factors That Facilitate the Application of ICT in Secondary Schools
- Holding training courses on software such as Word, PowerPoint, Excel, Access etc
- Holding training courses on email
- Providing correspondence instruction in different areas of ICT for teachers and students

CONCLUSION

It is imperative to employ ICT in education to improve learning outcomes and incorporate communication technologies pervasive in all aspects of students' lives. Review of existing research illustrated the extensive impact of ICT in education around the world. Based on the driving need to incorporate ICT in education, our main concern was to assess the feasibility of applying ICT in Iranian secondary schools. Specifically, we examined five main issues: 1) The most applicable areas for ICT; 2) the current conditions, ICT equipment and resources; 3) the required conditions, ICT equipment and resources; 4) the barriers to using ICT; and 5) the factors that facilitate the use ICT in secondary schools.

The results, from 362 teachers at Tehran secondary schools, identified the important areas ICT can be applied in secondary schools. The results stressed that the current conditions, equipment and resources for the application of ICT in secondary schools were not sufficient or appropriate for the successful application of ICT in secondary schools and the teachers also listed and ranked conditions, equipment and resources that they considered essential to the future of ICT in secondary schools. The barriers to ICT proposed in this study were corroborated by the teachers, suggesting that these issues, if unresolved, may hinder future deployment of ICT in secondary schools along with teacher and student development, and these issues should be addressed through appropriate measures by educational officials. In addition, policy makers should to pay serious attention to the facilitative factors teachers confirmed and ranked in this study, as these play an important role in the successful application of ICT.

When the advantages of using ICT in education are clearly understood, policy makers pay more attention to developing and applying technology in schools: Observed measures and activities in Iran and across the world around the world confirm this fact. The effective use of ICT in schools also requires that teachers believe in the benefits of technology for themselves and their students. There is a growing awareness among teachers that ICT can deliver many new opportunities, such as the capability to play a new role in the teaching/learning process: The role of knowledge facilitator instead of just a knowledge transmitter. Moreover, it should be noted that the improvement of teacher's skills and knowledge, in addition to their viewpoint, is of utmost important.

When dealing with an ICT programme of this size and scale, it is essential to address two key areas of technology risk: 1) prepare the appropriate technology infrastructure to decrease the current gap between the current and desired situation as much as possible; and 2) eliminate barriers to using ICT in schools. By achieving this, we can claim that applying ICT will create an environment that fosters creativity.

Based on the findings of the present study the following suggestions are made to pave the way for applying ICT secondary schools:
- Expand accessible communication networks
- Effective and useful planning and policy-making for the extensive use of ICT at secondary schools
- Increase school budgets to make use of ICT
- Improve the quality and quantity of classes utilising ICT in teaching and learning
- Improve the computer and internet knowledge and skills of teachers and students
- Motivate teachers and educate staff to support ICT-enabled environments
- Provide financial support for teachers to buy a computer and accessories
- Equip schools with a variety of necessary computer hardware
- Encourage teachers and students to use ICT facilities
- Create personal websites for teachers to build interest and teachers' cooperation
- Provide more facilities, such as digital libraries, and equipment for teachers' use
- Encourage teachers and students to use electronic communication with colleagues from other national or international schools both nationally and internationally.

- Acculturate the new mode of teaching and learning with effective ICT in secondary schools

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A RESEARCH INTO THE PEDAGOGIC FORMATION, FOREIGN LANGUAGE AND COMPUTER RELATED KNOWLEDGE OF TRACK AND FIELD TRAINERS IN TURKEY

Hacı Ahmet PEKEL
Gazi University, School of Physical Education and Sports

ABSTRACT
Foreign language, computer programs and social network applications or web sites are widely used by many people nowadays for various aims. In the literature, the number of studies investigating over university departments of physical education or more specifically to say, taking sports students' and teachers' foreign language and social networking usage ability as a research area is highly limited. Besides, the data extracted from trainers in regarding to their skills in foreign language and computer usage is not common enough in this research area. This research was done for the track and field trainers in Turkey. The participants of the study were comprised of 97 men and 45 women. The data were collected by the researcher and analyzed by with SPSS (22.0 for Mac, IBM Corp, Armonk, NY, USA); descriptive statistics, cross tabulations and correlations were calculated. According to the result of the study most of the trainers didn't learn foreign language and some trainers don't use computers and social networks in their professional life at all. To improve the international relationship between the trainers around the world and to make a significant research, it appears that the trainers should also improve themselves to learn computer programs, foreign languages and they should also take pedagogic formation courses to convey their knowledge accordingly.

Keywords: Track and field, education, trainer, computer programs, foreign language, pedagogic formation

INTRODUCTION

Recently, the world has been experiencing a kind of shift as a result of ongoing technological innovations, which is transformed into and better known nowadays as information technology (IT). Not only that this shift has transformed societies so far, but also led "informatics" revealing as a field on its own.

Social networking, (Computing) which had released mark an era during 90s in developed countries, has been also welcomed and fulfilled the expectations within a short time in Turkey as well by leading interpersonal communication and several computing programs around the country. Yet, it appears that the technology which has been improving day by day has revealed out more specialized people getting educated about this new computer programs.

In our country many important steps have been taken so far. As many investments done on sport and sportsmen could be one of the signs, on the other hand, the considerations of national sport facilitations and the transition of Youth and Sport General Directorate to the ministry level have accounted some of the important moves supporting the sport development in the country.

By looking through a trainer perspective, as the idea of limitation in sport does not exist, the profession of trainer is carrying an important role in this regard. In this important profession, it is a big time waste for a trainer to learn some of the notions by only experiencing in today's conditions. Yet, a trainer who has sufficient language ability can also have more potential to conduct a research online, not only to contact external world through camping, international competitions and educational activities. Moreover, a trainer who has learned some of the good beneficial computer programs well enough, is more likely to take logical steps by preparing a decent training program for an athlete and having any comments and analysis taken by the science experts in this regard.

Yet In this regard, when the improvement and the employment of a trainer are taken as a consideration, there reveals some inconsistencies. At the end of 1990s when General Directorate of Sport published the 'Trainer Education Regulations', in spite of the autonomy of all the sport federations, most of the time the regulations had been functioning in the same way. As some of the people call having the ability of computer programs, formation knowledge or a foreign language training only as 'personal improvement', if one analyses Turkey Athletic Federation 'Trainer Education Regulations', there is no information/criteria about the skills mentioned or related to any training program. (www.taf.org.tr). Moreover, even though there are some criteria related to the

trainers employed by the federations and the ministry in contract, still such skills and the abilities are not taken as a big consideration. The most important two criteria which are 'having the second level trainer certificate and been employed three times in national team' are simply leading people to become a trainer candidate in either a federation or the General Directorate Organization. On the other hand, university where is the second place of educating trainers, is playing a different role in the country. After four years of the under garduate study at the department of Trainer Education within Physical Education and Sports School and the Faculty of Sport Sciences, a trainer who achieves to receive a third level senior trainer certificate, has already taken computer and foreign language courses in at least two semester (56-84 course hours).

Social Networks and Physical Education
It is believed that web tools can be used by PE (Physical Education) teachers to develop their own performanse and foster students' learning processes, when physical education is considered (Balcıkanlı, 2012) Mohnsen (2008) stated that social networks helps, students understand PE related concepts, introduces students motor skill techniques, provides simulation and practice experiences, supports self-paced learning and unlimited practice, provides immediate and constructive feedback, and accommodates various learning styles.

In this research, the analysis of trainers' knowledge about computer programs and foreign language abilities are taken as focus with some suggestions.

THE STUDY
Data Collection
This research was carried out by using descriptive/survey method. To improve the reliability of the surveys, the method had tested before between two groups in two weeks interval. As people have participated into the survey as being volunteers, the method was carried out as personal practicing. In the first section of the survey, the personal information, in the second section, the most commonly used computer programs, at the third section; the levels of foreign language skills were questioned.

The research was conducted by total number of 159 surveys in which 17 of them was not accounted since some of the questioned were not answered or replied as carelessly. The total number of 142 trainers who participated into this survey were both having their 2014 license approved by Turkey Athletic Federation, as 45 of them were women, whereas, 97 of them were men.

Data Analysis
The survey results were computed all in a statistical package (SPSS 22.0 for Mac, IBM Corp, Armonk, NY, USA). Data is evaluated for frequencies in crosstabulations and descriptive statistics, and only in some cases correlations were looked.

FINDINGS

Table 1: Descriptives of the test subjects concerning their age, education, coaching level and coaching discipline

	Age						Education					Coaching Level					Discipline				
	18-21	22-30	31-40	41-50	51-60	61- up	Primary school	Secondary school	University graduate	Masters degree	PhD	Assistant coach	Coach	Senior coach	Head coach	Technical director	Sprint & hurdles	Middle & long dist.	Throws	Jumps	Multiple
n	1	41	55	28	12	5	1	9	115	14	3	48	52	30	5	7	39	58	21	22	2
%	.7	28.9	38.7	19.7	8.5	3.5	.7	6.3	81	9.9	2.1	33.8	36.6	21.1	3.5	4.9	27.5	40.8	14.8	15.5	1.4

The majority of the respondents who participated in the study are composed of middle-aged trainers (38.7%), meanwhile with over 61 years and under 21 years of age group as the rest of the test subjects form the least (4.2%).

The majority of the respondents, who participated in the study, are university graduates (81.0%), meanwhile, there are 10 elementary and high school graduates with the percentage of 7.0%.

As analyzing the stage levels of trainers in this research, it could be seen that the largest percentage, 36.6%, is collected among the trainers being in the second stage level. The number of head coaches and technical director-level managers participating in the research group is quite small (8.5%)

The majority of the respondents who participated in the study are composed of medium-to-long-distance trainers (40.8%). The least number of trainers is formed in the category of multi-branch managers (1.4%) as the last twenty years there have achieved no any success among in international competitions.

Table 2: Data about income, coaching only or any additional job and foreign languages spoken by the trainers

Variaables	Income TL					Coaching + secondary job							Foreign language			
	850 - 1150	1151 - 2000	2001 - 3750	3751 - 5000	5001 - up	Coaching is only job	PE Teacher	Civil servant	Sports management	Army servicemen	Self employed	Other	No foreign language	English	German	Other
n	25	26	70	13	8	61	46	3	6	2	21	3	67	71	2	2
%	17.6	18.3	49.3	9.2	5.6	43	32.4	2.1	4.2	1.4	14.8	2.1	47.1	50.1	6.3	1.4

While a quarter of the subjects participating in the study are having the minimum wage income, the percentage of the test subjects whose income fall below the poverty threshold, as defined in 2014 by the State Statistics Institute, is 35.9%. Approximately two-thirds of the subjects' income is above the poverty threshold (64.1%%). (www.tuik.gov.tr).

43% of the test subjects are athletic trainers, while other professional groups in the rest of the group are forming 57% of them. The largest group within these occupational groups is forming the highest percentage of 32.4% as Physical Education Teachers.

While half of the test subjects stated that they have the ability of using English language (%50,1), the number of the subjects who can declare that they can use other languages, is formed as 4 (%2,8).

Table 3: The status of the test subjects concerning their formative education, in-service training and foreign language ability

	Taken any seminar/panel etc. in previous year		Taken any formation course		Know foreign language		Any certificate of foreign language	
	n	%	n	%	n	%	n	%
Yes	86	60.6	47	33	75	52.8	6	4.2
No	56	39.4	95	77	67	47.2	136	95.8

While more than one-third of the subjects stated that they did not attend any personal development seminars, panels, in-service training or so on during the past year, one-third of the test subjects stated they have taken formative education training which is playing a major role in interpersonal communication. The percentage of the test subjects who does not know any foreign language is almost forming the half of the total test subjects (%47,2), whereas the number of the subjects who can proof their foreign language ability is only 6 (%4,2).

Table 4: The levels of foreign language speaking and writing ability among the test subjects

Skill	Speaking		Writing	
Level	n	%	n	%
None	70	49,3	76	53.5
Poor	34	23,9	29	20.4
Average	32	22,5	30	21.1
Good	6	4,2	7	4.9

Among the test subjects to compare their levels of foreign language speaking and writing ability, almost half of them stated that they do not have the ability of speaking a foreign language, whereas, more than half of the stated they do not have the ability of writing (respectively %49,3 and %53,5). The ability of speaking and writing above the average among the test subjects are respectively followed as %4,2 and %4,9.

Two-thirds of the test subjects participating the research (%64,8) stated that they had their first foreign language education either in primary, middle, high school or universities, whereas, the percentage of %31 of the test subjects stated that they had in Turkey or abroad.

Tablo- 5: The crosstabulation of coaching level versus education level

			Education Level					Total
			Primary school	Secondary school	University	Masters degree	PhD	
Coaching Level	Assistant coach	Count	1	2	41	4	0	48
		% within Coaching	2.1%	4.2%	85.4%	8.3%	0.0%	100.0%
		% within Education	100.0%	22.2%	35.7%	28.6%	0.0%	33.8%
	Coach	Count	0	5	42	4	1	52
		% within Coaching	0.0%	9.6%	80.8%	7.7%	1.9%	100.0%
		% within Education	0.0%	55.6%	36.5%	28.6%	33.3%	36.6%
	Senior coach	Count	0	2	26	1	1	30
		% within Coaching	0.0%	6.7%	86.7%	3.3%	3.3%	100.0%
		% within Education	0.0%	22.2%	22.6%	7.1%	33.3%	21.1%
	Head coach	Count	0	0	1	3	1	5
		% within Coaching	0.0%	0.0%	20.0%	60.0%	20.0%	100.0%
		% within Education	0.0%	0.0%	0.9%	21.4%	33.3%	3.5%
	Technical director	Count	0	0	5	2	0	7
		% within Coaching	0.0%	0.0%	71.4%	28.6%	0.0%	100.0%
		% within Education	0.0%	0.0%	4.3%	14.3%	0.0%	4.9%
Total		Count	1	9	115	14	3	142
		% within Coaching	0.7%	6.3%	81.0%	9.9%	2.1%	100.0%
		% within Education	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

If the test subjects' stage training levels and their education status are compared, it could be seen that the majority of the whole stage trainers are university graduates (%81). While the test subjects who have 5th stage of training level, also known as the highest stage as a trainer level, have not got education lower than the university degree, on the other hand, over the 1st stage of training level, 4 trainers have completed their masters degree in the field.

Table 6: The data of the test subjects concerning their usage of computer programs

Program	Windows in Genaral		MS Word		MS Power Point		MS Excel		Multimedia Programs	
Skill level	n	%	n	%	n	%	n	%	n	%
No experience	6	4,2	23	16,2	21	14,8	24	16,9	40	28,2
Little experience	23	16,2	45	31,7	54	38,0	54	38,0	47	33,1
Good	66	46,5	53	37,3	48	33,8	43	30,3	40	28,2
Advanced	47	33,1	21	14,8	17	12,0	21	14,8	15	10,6

The majority of the test subjects participating the study stated that they have experienced in windows, office programs, power point and excel. While the percentage of the subjects who declared that they have experienced in windows software is %46,5, the percentage of the subjects stating they have experienced in office programs is %37,3, in power point software %33,8, in excel software %30,3. One-third of the test subjects stated that they have at least engaged in multimedia programs.

DISCUSSION AND RESULTS
More than half of the test subjects participated into this survey are married, whereas, in two-thirds of the partners among them is working. This could show that the income of those trainers could be either close or above to the average national income when looking through the socio-economic perspective. As %90,1 percentage of the test subjects are having computer facility at home, more than half of the test subjects (%53,5) stated that they are

more often having laptop computers with them. Moreover, the majority of subjects stated they have instant mobile Internet connection facility. The point should be made here is that the trainers have the potential of following the recent developments in the world whenever they want.

The internet as a technological innovation has changed our lives in unimaginable ways (Forkosh-Barush & Hershkowitz, 2010) In another resaerch showede that social network environments introduces facilities for personal statements, creating interest groups, ensuruing cooparation and sharing information (Arguero & Romero-Frias, 2013). In researches related to Physical Education and Training, which is carrying out the same methods like trainer education, the suggestions presented over could be found very interesting as well. As far as physical education is concerned, it is believed that web tools can be used by PE (Physical Education) teachers to develop their own performances and to foster students' learning processes. Several studies looked at issues such as office applications (Güclü, 2010; Silverman, 1997; Yaman; 2007) multimedia software and its impact on motor skills (Mohnsen, 2008), instructional video analysis software to improve pupils' understandings on underlying concepts and techniques (Ladda et al., 2004), effects of web technologies on students' satisfaction (Vernadakis et al., 2012), and web developers as physical educators (Papastergiou, 2010). In a similar fashion, multimedia educational software, in Mohnsen's research (2008), constituted an important tool which;

- helped students understand PE-related concepts,
- introduced students to motor skill techniques,
- provided simulations and practice experiences,
- supported self-paced learning and unlimited practice,
- provided immediate and constructive feedback, and
- accommodated various learning styles.

The condition for accessing instant knowledge could be achieved by only using the most common languages around the world. A trainer, who can easily access to updated knowledge about training plans or technical-supports, should know the language of the researches firstly or get some support for the translation. The pages online which provide support for translating languages are most of the time not sufficient enough especially over scientific works, therefore, the trainers should know at least one reliable foreign language.

More than two-thirds of the participants (%38,7) are formed by test subjects whose age is 31 – 40 (Table 1). While the majority of the participants are university graduates (%81,0), the number of test subjects who achieved either masters or Ph.D. degrees is 17 (%12)(Table 1). When incomes of the trainers are put on analysis, %17,6 percentage of the participants' income could be seen as being minimum wage, the percentage of the test subjects whose income fall below the poverty threshold, 2000 TL, as defined in 2014 by the State Statistics Institute, is 35.9% (www.tuik.gov.tr). The percentage of the trainers whose income falls below the poverty threshold, as defined by TUIK 3.750 TL, is %85,2. Trainer, as being one of the professions can value in both material and spiritual ways. Even though at most of the professions the income could be fixed, the trainers can gain bonuses from national successes and club competitions so that the trainers' income could value more according to such extra earnings.

While half of the test subjects are being full time trainer, over the half has been engaging in other branches. The largest group within these occupational groups is forming the highest percentage of 32.4% as Physical Education Teachers. In order to become an elite sportsman, besides their profession of orienting talented student to the sports, from their training plans to the practices, the perspective of professionalism is one of the fundamental necessities in this occupation. Hence, according to the physical education instructors number one branch they have should be trainer-ship.

As analyzing the coaching levels in this research, it could be seen that the largest percentage, 36.6%, is collected among the trainers being in the second stage level. The number of head coaches and technical director-level managers participating in the research group is quite small (8.5%)(Table 1). Trainers, after the second stage training level, which is considered as the lowest stage and one of the conditions where the federations and Sports General Directorate are hiring, getting enough perks so they do not see good enough reasons to go to upper coaching levels.Yet, 61 trainers (%42,7) who have achieved to receive their trainer stage award, during past 5 years, stated that they have not joined any trainer-ship courses to improve their stage level afterwards. The point here is that some of the trainers who thought they have sufficient knowledge in the field, did not consider moving their in-service trainings to the upper level.

The majority of the respondents who participated in the study are composed of middle-long distance trainers (40.8%). The least number of trainers is formed in the category of multi-branch managers (1.4%) as in the last

twenty years Turkish athletics have not achieved any success during international competitions. The reason for this higher percentage of middle-long distance trainers than other groups is that this trainers group is also responsible from the athletic branch trainings like cross and mountain running which are mostly taking place during winter (Table 1).

While more than one-thirds of the subjects stated that they did not attend any personal development seminars, panels, in-service training or so on during past year, one-third of the test subjects stated they have taken formative education training which is playing a major role in interpersonal communication (Table 2). %97,8 percentage of tested subjects who have taken pedagogic formation took it as part of the curriculum while studying PE Teacher Training course at the university (Table 2). As the sports trainings are mostly accompanied and addressed by children and youngsters, there occur many doubts about the trainers who do not ever consider having this informative education.

The percentage of the test subjects who does not know any foreign language is almost forming the half of the total test subjects (%47,2), whereas the number of the subjects who can proove their foreign language ability is only 6 (%4,2)(Table 2). The participants who stated that they have the ability for any second foreign language usage are formed by one-tenths of the total test subjects (%9,9).

Among the test subjects to compare their levels of foreign language speaking and writing ability, almost half of them stated that they do not have the ability of speaking a foreign language, whereas, more than half of stated they do not have the ability of writing (respectively %49,3 and %53,5). The ability of speaking and writing above the average among the test subjects are respectively followed as %4,2 and %4,9 (Table 4). This analysis proove that some of the trainers who also attends in the national team, most of the time must have difficulty in communicating with others during international competitions.

On the other hand, a trainer who does not have sufficient foreign language ability to follow the recent updated articles, scientific works or reports, ultimately, either will become needy in extra help for translations or get excluded by that knowledge.

Two-thirds of the test subjects participating the research (%64,8) stated that they had their first foreign language either in primary schools (Ministry Of Education) or universities (The Institution of Higher Education), whereas, the percentage of %31 of the test subjects stated that they had courses either in Turkey or abroad. The percentage of the test subjects, who stated that they learned a foreign language on their own, is %4,2.

The majority of the test subjects participating in the study stated that they have experienced in windows, office programs, power point and excel. While the percentage of the subjects who declared that they have experienced in windows software is %46,5, the percentage of the subjects stating they have experienced in office programs is %37,3, in MS power point %33,8, in MS excel %30,3. One-third of the test subjects stated that they have at least engaged in multimedia programs (Table 6). No doubt, such office programs increasing productivity in professions are turning into an important support tool for the profession of trainer-ship as well in terms of planning or determining the training schedule. In most of the study it is also revealed that such ability on computer software has been playing an important role and presenting many advantages in professions that can give a significant support to job holders. According to Balcıkanlı's research (2012) social networks offer great opportunities for students and teacher to interact with each other in a social manner, it allows students to reach the calss content and materials posted very easily online; it encourages students to share their assignmant and project with each other; it offers a platform where students and teacher can discuss the relevant topics and give feedback to each other's work; it enables students to focus on the class materials outside the classroom, which is closely linked to independent learning and it increases students' motivation to do more research about the topics in question. Another research indicated most of the students who are attending the school of physical education and sports think that social network sites can be used by phsical education and sports students for educational purposes effectively. These sites can provide a good comminication basis for achieving their educational aims (Yaman M.& Yaman Ç., 2014).

If the test subjects' coaching levels and their participation of any seminar, panel or in-service training are considered, the majority of senior trainers, %76,7, stated they attended at least one in-service training during the past year. The second stage level trainers are achieving the most participation into in-service training (%43,0).The first level trainer, who can not provide training alone they should work with a high level trainer. Second and higher levels don't need this; even a high level trainer can train an athlete in any category or branch. One of the terms of being a "second level trainer" means the trainer should have attended at least 2 seminars.

Consequently, the trainers who want all rights and authority on their hands and to train the athlete in this way should have been attended a couple of seminars to apply the second level trainership.

If the test subjects' coaching levels and their education status are compared, it could be seen that the majority of the trainers are university graduates (%81) (Table 5). If the coaching levels and financial income of the subjects are compared, it could be seen that the highest percentage, %49,3, between 2001 – 3750 TL is composed by senior trainers. When the coaching levels are getting higher because of a trainer gets more experienced, it ultimately causes in multiple extra incomes (for ex. Club income, success, awards and bonuses).

SUGGESTION

During the 5 levels trainer-ship given by Sports General Directorate Education Training Department, especially after 1st stage of the assistantship, a kind of computer usage ability and foreign language skills should be compulsory in every stage. In this regard, the courses related to foreign language and computer software given by online to some universities could be taken as a focus. For instance, such draft bills like 'the person who achieved 1st stage of trainer assistantship, in order to move upper 2nd stage, needs to take foreign language and computing courses during at least one study semester or a reliable proof document which is approved by OSYM, showing the points at least 30 out of 100 could be requested as well.

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A SYSTEMATIC APPROACH TO IMPROVING E-LEARNING IMPLEMENTATIONS IN HIGH SCHOOLS

Bens Pardamean and Teddy Suparyanto
Graduate Program of Information Technology, Bina Nusantara University, Indonesia
bpardamean@binus.edu

ABSTRACT
This study was based on the current growing trend of implementing e-learning in high schools. Most endeavors have been inefficient, rendering an objective of determining the initial steps that could be taken to improve these efforts by assessing a student population's computer skill levels and performances in an IT course. Demographic factors were also taken into account while formulating these recommendations. Basic computer skill levels were measured through the administration of the Technical Survival Skill Test (TSST) questionnaire, developed by the University of Toronto. Academic performances were evaluated through several assignments designed by the IT course instructors. The main result of this study indicated that computer skill levels did have a direct correlation with a student's academic performance level. The database was further parsed based on demographical factors, resulting in a set of recommendations to enhance the effectiveness of e-learning.

Keywords: learning management system, LMS, technical survival skill test, TSST

INTRODUCTION
Through recent times, the Information and Communication Technology (ICT) has steadily become a part of the curriculum in numerous educational institutions, i.e. the use e-learning, which utilizes Internet technology in delivering learning experiences (The Herridge Group Inc., 2004). A form of this delivery method called the Learning Management System (LMS) mediates both the administrations of course instructions and materials (Brown & Johnson, 2003) and the tracking of student progress.

E-learning is currently being developed by several educational institutions for all grade levels, including those in high school. As Ceriejo states, there are some tangible benefits in using e-learning. Many researchers find that these benefits, experienced by both students and instructors, include the asynchronous nature of online learning, the flexibility in class activities based upon the students' schedules, and the personalized feedbacks (Saadé, Kira, & Dogmoch, 2007). In order to successfully implement e-learning, some possible barriers ought to be minimized. One barrier would be the participants' basic computer skills (Vecchio & & Loughney, 2006; Nedelko, 2008). At post-secondary education level, the University of Toronto establishes a standard scoring system for basic computer skills required for a proper implementation of an e-learning program.

Within Indonesia's education system, high school commences at the tenth grade level, which is a critical period for e-learning utilization since it is the introductory period when students need comprehensive guidance on how to navigate through an e-learning delivery system. The success of using e-learning at this grade level serves as the basis for further e-learning implementation in subsequent grade levels. The findings of this study would help a school in determining strategies to adopt for ensuring a successful e-learning implementation at the high school level. For this reason, the focus of this study was on the implementation of e-learning in a tenth grade course; in this case, the specific course selected was on Information Technology (IT). This study aimed to examine the correlation between students' computer skills and their academic performance within the IT course. A pre-evaluation was performed to determine whether there were differences among the computer skills of the students, based on various demographic factors prior to e-learning utilization.

E-learning Concept
E-learning is a dynamic process rather than a static one. With the progression of time, e-learning has been redefined and refined based on recent technological developments. The Herridge Group Inc. (2004), Cross (2004), Fournier (2006) as well as Garg and Jindal (2009) have reached a convergent conclusion that e-learning can be defined as a method to establish teaching and learning process through the use of Internet and information technology devices. E-learning comprises three essential elements (Anderson, 2004): the teaching process (the teacher), the learning process (the student), and the content or knowledge (delivered through the Internet). Figure 1 depicts a model that maps the interactions among the three elements, which result in six types of relationship

pairings: student-student, student-content, student-teacher, teacher-teacher, teacher-content, and content-content. Furthermore, Table 1 shows examples of ICT that could facilitate the interactions among those elements.

Figure 1. Interaction Mapping Among Student, Teacher, and Content through the Use of Technology
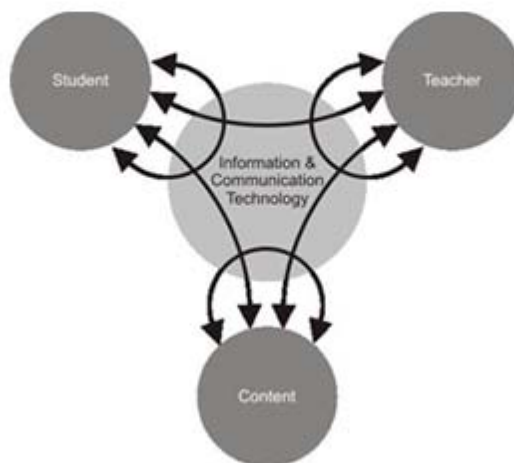
Table 1. Examples of ICT Implementation in Relaying the Interaction among E-Learning Elements

No.	Relation	Examples
1	student-student	chat, forum, email
2	student-content	download, search, view, create
3	student- teacher	chat, forum, email
4	teacher-teacher	chat, forum, email
5	teacher-content	upload, view, create
6	content-content	link files, indexing

A Learning Management System (LMS) efficiently establishes and facilitates an e-learning process. LMS is "an information system that administers instructor-led and e-learning courses and keeps track of the student's progress" (Brown & Johnson, 2003). LMS simplifies the efforts in the training, evaluation, and tracking of students in their academic experience and performances.

MOODLE as an Integrated LMS
Modular Object-Oriented Dynamic Learning Environment (MOODLE) is an open-source Course Management System (CMS), also known as an LMS or a Virtual Learning Environment (VLE) (Moodle Inc., 2010). As an open-source application, MOODLE is built with PHP and MySQL (Selvi, Balasubramanian, & Manohar, 2008) and can be installed in a Windows platform. Additionally, it includes Linux (www.linux.com) as the operating system, Zope (www.zope.org) as the application server, Python (www.python.org) as a lower-level programming environment, Apache (www.apache.org) as the web server gateway, and a number of Unix shell scripts to control the system (Dougiamas, 2000).

Shweta and Shri Ram (2009) state that MOODLE is an e-learning tool that could offer simple and safe solutions to any segment of an institution, be it small-scale (such as an individual teacher) or large-scale (such as an entire faculty of a university). Furthermore, MOODLE facilitates online collaborations, which can involve teacher-to-student, teacher-to-teacher, or student-to-student interactions (Shweta & Shri Ram, 2009).

MOODLE's function as a developer of constructivist (student-centered learning) environments (Dougiamas & Taylor, 2003) is examined by Antonenko, Toy, and Niederhauser (2005) through the use of a framework developed by Hannafin and Land (1997). The framework consists of five components: psychological,

pedagogical, technological, cultural, and pragmatic. Figure 2 highlights the five components of these core foundations as applied to the design of student-centered learning environments.

Figure 2. Framework of MOODLE in Building
Student-Centered Learning Environments
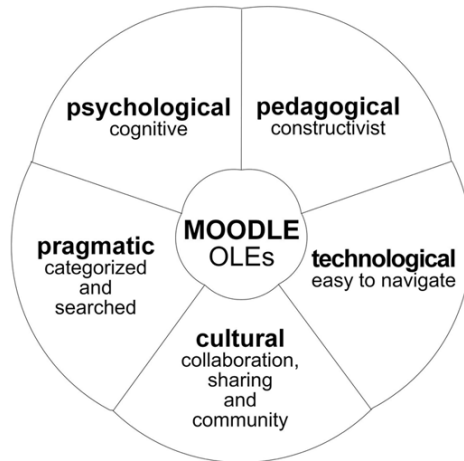
E-learning for High School
It is generally suggested that e-learning ought to be implemented in almost every high school setting (Vecchio & & Loughney, 2006; Cavanaugh, Gillian, Kromrey, Hess, & Blomeyer, 2004; Solomon, 2005). In the United States, there is a widespread implementation of e-learning within the K-12 level. According to the US Department of Education's National Education Technology Plan, "[a]t least 15 states provide some form of virtual schooling to supplement regular classes or to provide for the special needs. Hundreds of thousands of students are taking advantage of e-learning [during] this school year. About 25 percent of all K-12 public schools now offer some form of e-learning or virtual school instruction." (US Department of Education, 2004).

The majority of high schools in Indonesia are yet to accomplish this level of e-learning ubiquity. Each student is accustomed to attending classes regularly during a specific time period. Therefore, a less drastic measure was taken for e-learning implementation; i.e. its parallel incorporation with regular, traditional classroom instructional sessions (Edler, 2006).

Students' Computer Skill
As a prerequisite, each student must have basic computer skills (the knowledge on how to use modern ICT and computer) to participare in an e-learning system (Nedelko, 2008). Some researchers have studied the computer skills itself, e.g. Madigan, Goodfellow, and Stone (2007), who identify that a set of computer skills has five constructs: basic computer operation, electronic communication, word processing and spreadsheet, presentation software, and information retrieval and research.

Vecchio and Loughney (2006) state that in order to succeed in e-learning, participating students need to have the computer skills to operate programs for word processing, Internet browsing, and e-mailing because Internet browser, e-mail, and basic word processing software are the application's software layer, e.g. Windows, Macintosh, or Linux. Students need the Internet browser ability for communication via email address, which subsequently involves email management. The relationships between different computer skills and e-learning are mapped in Figure 3.

Figure 3. Framework of the Relationship between
Computer Skill and E-learning

COMPUTER SKILL

Basic Computer Skill

Internet Browser Skill

Basic Word Processing Skill

E-mail Skill

ELEARNING
Learning Process
Assesment
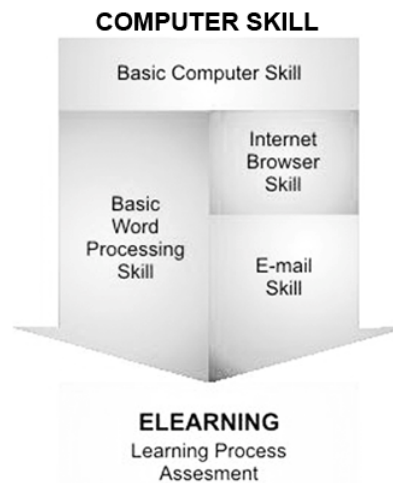
METHOD
This study was a non-experimental quantitative research. It involved collecting data to determine the existence and extent of a relationship between a tenth-grade student's computer skill and the student's achievement in the IT course, which was conducted through LMS. Furthermore, an analysis was also conducted in order to determine if there were any differences in the students' computer skills and their achievement before and after the e-learning implementation. Analyses were also performed based on the students' demographic data, which consisted of gender, religion, socioeconomic status, entrance exam result, verbal skills, logic skills, and arithmetic skills.

The e-learning system was implemented at a private high school during the first semester of the 2011-2012 academic year. This study used convenience sample with non-probabilistic sampling technique. A probabilistic sample was not necessary for this research since all students enrolled in the IT course participated in the study, totaling to 182 students.

Instrument And Data Collection
A test called the Technical Survival Skill Test (TSST) was used to determine the students' computer skill levels in the form of numerical scores. TSST was developed by the Ontario Institute for Studies in Education (OISE) and the University of Toronto (OISE University of Toronto, 2007). It was used by the OISE as a prerequisite for e-learning system at University of Toronto. A similar type of test was also used by the North Seattle Community Colleges (Washington State Board for Community and Technical Colleges, 2010), University of Michigan (University of Michigan: School of Dentistry, 2009), and other online educational institutions.

TSST consists of four segments that measure desktop computer skills, Internet browsing skills, e-mail - portal skills, and basic word-processing skills. The reliability of this instrument within the students in high school was determined before more in-depth analyses were done. TSST was administered to the sample on one occasion. The internal consistency was measured with Cronbach's alpha technique.

The students' achievement scores were obtained through their average scores from all assignments that they had completed during the first semester. The assignments were design by the IT teachers according to the standards established by the Indonesian Department of Education, written in the *Kurikulum Tingkat Satuan Pelajaran* (KTSP); it was a curriculum implemented by all national schools in Indonesia (Kementrian Komunikasi dan Informatika Republik Indonesia, 2007). The assignments consisted of tasks and quizzes that were developed to measure the students' mastery of course materials. This measuring technique had fulfilled the face validity, content validity, and construct validity. According to Bordens and Abbot (2008), the three types of validity requirements can gurantee the accuracy of a measurement. It was arguable that the students' achievement measuring technique was accurate.

Data Analysis

This study analyzed two main variables: the students' achievement as the dependent variable and the students' computer skills as the independent variable. Analytical methods used were correlation analysis and regression analysis. Pearson's correlation analysis was used to determine the degree of correlation since there were more than 30 participants in the study. Pearson's correlation reflected the degree of linear relationship between the two variables. The regression analysis used in this study was the linear regression analysis. The regression equation was formulated and could be used to predict the value of dependent variable if the independent variable's value was given. The correlation and regression analyses were used based on the assumption that there were no difference in the students' computer skill and students' achievement based on their demographic data. If there were differences, ANCOVA analysis would be performed to account for all covariates involved.

RESULTS AND DISCUSSION

Based on the TSST's Cronbach's alpha score analysis, the Cronbach's alpha score for 40 items in TSST was 0.923. A Cronbach's alpha score greater than 0.600 was considered to have a high level of reliability (Priyatno, 2009). Based on this, the TSST had a high reliability level in measuring the computer skills of high school students.

The main result of this study concluded that the students' computer skill had a direct correlation with the students' achievement through the use of learning management system for information technology subject among grade ten students. The correlation was significantly strong (r (172) = 0.896, p <0.05). Moreover, the result also found that all of the computer skill sub-scores had significantly strong correlation with the students' performance. From the correlation analysis between the students' computer skill sub-scores and the students' academic achievement, the study found that Basic Word-Processing Skill scores had the lowest significant correlation (r (172) = 0.624, p < 0.05), while the Internet Browsing Skill had the highest significant correlation (r (172) = 0.866, p < 0.05), relative to other computer skill sub-scores. These results were in-line with previous studies that found students who participated in e-learning must possess computer skills in order to be successful in e-learning (Taynton, 2000; Cavanaugh, Gillian, Kromrey, Hess, & Blomeyer, 2004; Clarke, Ayres, & Sweller, 2005; Vecchio & & Loughney, 2006; Australian Flexible Learning Framework, 2007; Saadé, Kira, & Dogmoch, 2007; Nedelko, 2008; Shweta & Shri Ram, 2009; Tsai, 2009). Taynton (2000) observes that students in Southern Cross University required support in developing computer literacy for an effective online participation. From another study, Tsai (2009) finds that Internet literacy was important in measuring the Online Learning Strategies Scale.

The results of this study also showed that computer skill scores differed by gender. The female's mean scores of computer skill and student's achievement were significantly higher than those of the male students (t(172) = 2.147, p < .05   and t(182) = 2.970, p < .05). It was reported that female students enjoyed the e-learning experience more than the male students did (Boulton, 2008). Although females had a higher potential to excel in the IT field, their interest in pursuing IT as a career was low (Davies, Klawe, Ng, Nyhus, & Sullivan, 2003; Reding, 2007). Davies, Kalwe, Ng, Nyhus, and Sullivan (2003) identify the major causes for this phenomenon, such as gender-bias socialization, lack of access and experience in computers, negative attitudes, and low perceived ability career. The low interest might also be caused by computer anxiety. Saadé, Kira, & Dogmoch (2007) points out that female population scored at the high-end of the computer anxiety spectrum. This result differs from others that discussed gender issues within the context of ICT. Faekah (2005) discovers that female students are still lacking in terms of computer skills. However, severalr studies' findings state that both male and female students had approximately the same level of actual ICT skills (Kay, 2006; Madigan, Goodfellow, & A. Stone, 2007).

Additionally, the results also showed that there was a significant difference in the mean scores based on the father's education level, (t(170) = -2.448, p < .05). Indonesia is a country that adopts paternalism as stated by the Ministry of Communications and Information Technology of the Republic Indonesia's website [38]. Male parent typically becomes the leader in the family and has an influence on the availability of computers in the family. Furthermore, some studies observe that parents have a major influence on computer ability (Galpin, Sanders, Turner, & Venter, 2003; Sanders, 2005). Further analysis showed that the father's level of education affected the students' computer skills. Students whose fathers completed a Bachelor's degree or beyond have a higher mean of computer skill scores compared to those whose fathers completed an education level below Bachelor's.

This study also found that students' verbal abilities and entrance exam scores for English correlated with their computer skills. Verbal ability is a psychological variable used to explain why vocabulary scores correlate with verbal analogies that lead to the determination of semantics, allowing for the logical deduction of relationships between word pairs (Carey, 2000). In e-learning, commands and tasks are given by teachers to students in

writing and in this case, mainly in English. Students needed the verbal ability to interpret the instruction given by the teacher and to work with computer (Karsten & Roth, 1998; Gugerty, Treadaway, & Rubinstein, 2006; Bakar, 2007). In line with the study by Gugerty, Treadaway, and Rubinstein (2006), this study also found that verbal ability had the highest correlation with Internet browser skills compared to other computer skill sub-scores because verbal ability had a direct influence on searching ability.

The TSST is a test that was constructed to measure the skills needed by students in order to keep up with an e-learning process. This study found that abstract logic did not correlate with computer skills that were measured by the TSST. Thus, in order to adapt to the e-learning process, students did not require a prominent logic ability. Nevertheless, logic ability does correlate with other computer skill indicators, especially in computer programming skills (McMahon, 2009).

The groups in grade 10 study subjects equitably distributed based on students' abilities. For a school considering e-learning implementation, the level of computer skills should be considered when placing students into groups. This is necessary since students' computer skill correlates with their achievement in through e-learning. For this study's subjects, the standard score of mastery learning outcomes (*Ketuntasan Hasil Belajar*) is 70 for IT subject. In order to attain this score, based on the regression equality, a student should have a computer skill score of at least 68.23.

This study produced key points that should be considered before and during the implementation of e-learning. The result of measuring the relationship between students' computer skill and students' achievement could be used to assist in the strategy development for e-learning implementation. Some suggestions are as follows:
  a) Student Admission Process
     This study showed that the students' computer skills had a strong correlation with their achievements. Therefore, it is important to consider the influence of computer skills on achievement when implementing ICT into the learning process. A computer skills test should be designed and administered as a part of the student admissions requirements. The test should be taken prior to the students' participation in an e-learning process. Furthermore, the school that implements an e-learning should consider students' computer skills when dividing the students into groups based on students' abilities.
  b) Enrollment and Course Management Process
     This study concluded that proficiency in e-mailing skills is one of the four computer skills that students should possess in order to keep up with e-learning. Students need to have the ability to manage their email accounts before they log into an e-learning portal for the first time, especially since the administrator sends the username and initial password through email.
  c) Learning Process
     The suggested type of e-learning for the high school level is the combined model. This model allows teacher and student to meet (offline) in a class. The e-learning can be delivered using MOODLE as an LMS.
  d) Assessment Process
     In a combined model, there is an online and offline component to the learning process. The assignments can be done online and/or offline. The final score is an average score of all the online and offline assignments.

CONCLUSIONS

Revealing the basic foundation of e-learning implementation is necessary in order to maximize the learning process. This can be achieved by examining all aspects related to education and technology. This is in line with Honey, Culp, and Spielvogel (2005) who state that there is a correlation between technology and students' achievement. In fact, students' achievement measurements are not solely based on cognitive scores (Honey, Culp, & Spielvogel, 2005). There are other scores that must be taken into consideration, such as the psychomotor and affective scores. These two variables are related to the achievement scores and can be examined further.

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CORRELATION BETWEEN CULTURAL PERCEPTIONS, LEADERSHIP STYLE AND ICT USAGE BY SCHOOL PRINCIPALS IN MALAYSIA

Anantha Raj A. Arokiasamy
Quest International University Perak (QIUP)
Faculty of Business, Management and Social Sciences (FBMSS)
Ipoh, Perak, Malaysia.
Email: anantharaj.arokiasamy@qiup.edu.my

Dr. Abdul Ghani Kanesan bin Abdullah
Email: agk@usm.my

Dr. Aziah Binti Ismail
School of Educational Studies, University Science Malaysia (USM), Penang, Malaysia.
Email: aziah@usm.my

ABSTRACT
School leaders are key factors in implementation of information and communication technology (ICT) in schools. They need to understand the capacities of the new technologies, to have a personal proficiency in their use, and be able to promote a school culture which encourages exploration of new techniques in teaching, learning and management. However, there is less information about the current status of ICT use by Malaysian school principals. This paper investigated the extent to which secondary school principals use computers in Malaysia and determined factors related to level of computer use by principals (cultural perceptions and leadership style of principals). Initial report also highlighted analysis of a baseline data gathered from 520 secondary school principals in the state of Selangor and Wilayah Persekutuan, Malaysia. Findings indicate that school principals are using computers for instructional and administrative purposes and they have moderate competency in computer applications and spent a few times a week working on their computers. Also, cultural perceptions and transformational leadership contributed significantly to the level of computer use by principals. It is anticipated that the data obtained from the study will open new lines of inquiry about the crucial roles of school leaders in the adoption of ICTs and will contribute to decisions about future developmental needs because more will be known about their preparedness for change. Hence, policy makers must design professional development programs, such as leadership studies, in order to teach the components of transformational leadership; idealized influence, inspirational motivation, intellectual stimulation and individual consideration to future administrators.

Keywords: ICT, school principals, leadership style, cultural perception and Malaysia.

INTRODUCTION
ICT industries have proven to be the backbone of national development in many countries. Malaysia as a developing country is also experiencing a similar trend. Malaysia's total ICT expenditure indicates that more and more local organizations are incorporating ICT into their business activities. The government has prioritized ICT as an issue of national importance and established new agencies and policy initiatives to accelerate its implementation and thereby transform Malaysia into a developed and knowledge-based country (Tipton, 2002). It also accelerates the economic development and quality of life of the society (Lu, 2001). The rapid development in the ICT sectors beyond the expectation has created a vacuum in the employment trend. The ICT industry in Malaysia has enjoyed highest employment growth of 27.9% in 2010 and is expected to register 31% growth in 2013 compared to other industries (Employment Outlook, 2012). Beaumont et al. (2004), however, reported that there is an increase in shortage of skilled workforce in the country despite the increased demand for qualified ICT employees as more and more organizations continue to rely on ICT for their effectiveness and competitive advantages (World Employment Report, 2011).

ICT has pervaded almost every facet of our society. Around the world, ICT is ubiquitous in the business world, the workplace and at home. To ensure that schools keep pace with these developments in the larger society and to tap the enormous potential of ICT in teaching and learning, many countries have invested considerable amounts of resources to integrate ICT into education. Malaysia, for instance had invested RM1 billion between 1999 to 2005 to facilitate ICT integration in schools, spending mostly on hardware, software, infrastructure and training of teachers (Ministry of Education, 2001).

In discussion about the potential role of technology in education, Fiske and Hammond (1997) stated that instructional technology is considered to be a key to educational quality as we enter the new millennium. Many educators believe that computer use for instructional purposes can be employed effectively to enhance teaching and learning. In other words, computer technologies can change the teacher's role from information giver to facilitator, counselor, advisor, guide, coach, co-learner, mentor, resource and technology managers, and mediator to the students (Jonassen et al., 1999). Similarly, Attaran and Vanlaar (2001) pointed out that technology reduces record keeping time in schools and simplifies administrative tasks. Also, computer networking is creating a professional band between teachers and administrators. On the other hand, it offers teachers valuable methods of enhancing successful instructions. Besides, computer use assists students in meeting basic educational requirements and it fulfills an instructional need by individualizing the material to the competency level of the learner. In this way, computer use provides an active cooperative learning environment and offers the flexibility that is now mostly absent in the traditional classroom.

In addition, Otto and Albion (2004) reported that although ICT are now widely available in schools, it does not integrate fully into teaching and learning. In line with this idea, Sheingold and Hadley (1990) pointed out that integrating technology is not about helping people to use computers but it is about helping teachers to integrate technology as a tool for learning. In fact, in the ideal teaching and learning setting, technology should be as transparent a tool as a pencil. Therefore, technology integration in classrooms is more about teaching and learning than it is about technology (Mills & Tincher, 2002).

Unfortunately, the implementation of ICT into the Malaysian schools has not been guided by research. The "initiation stage" (Rogers, 1995), which demands information gathering and planning, has been overlooked in the urgency to implement ICT in schools. A key element that has been left out understands the cultural perceptions of the end-users toward these new tools. Such inattention to the principals' cultural perceptions may generate unforeseen repercussions for ICT diffusion in Malaysian schools. Many technology experts have pointed out that the integration of ICT in education should occur in the light of the cultural conditions of the country and the prevailing school culture (Watson, 1998; Harper, 1987; Thomas, 1987). Obviously, unless principals recognize the importance of ICT for their school and national cultures, they will not use it in their classes. This study is poised to investigate the extent to which secondary school principals use computers in Malaysia and determine the factors related to the level of computer usage by principals (cultural perceptions and leadership style of principals).

LITERATURE REVIEW
Leadership Style and Integration of ICT at Schools
Integration of ICT into education, as Eib and Mehlinger (1998) define it, is a procedure in which instructional technologies such as computers and software are applied regularly to support both teaching and learning across levels and subject matter.   There has been a significant amount of research devoted to the integration of ICT in schools, its effects on student learning and attainment, and hindrances that prevent its successful use (Becker, 1993; Butzin, 1992; Cafolla & Knee, 1999; Cradler, 1999; Kozma & Croninger, 1992). While some researchers have indicated the benefits of integrating ICT into education (Holinga, 1999; Taylor, 1992; Wibur, 1997), others have found that applications of ICT in the classroom conferred little or no positive improvement in student attainment (Slavin, 1991; Stevens, 1992). Picciano (1998), on the other hand, observed that the benefits that ICT integration confers on student attainment are not uniform at all grade levels.

While Baily (1997) suggested that the focus of ICT application should be teaching and learning due to its potential use in the classroom, Levinson (1990) pointed out that in addition to providing support in teaching and learning, ICT may be used to alleviate common problems in school such as teacher shortage and high costs of education. Technology could also create new solutions to cope with the spectrum of needs that arise in the classroom in this information age (Krajcik, Soloway , Blumenfeld, & Marx, 1998).

In the age of information, principals must be able to integrate ICT into their daily practice and to provide consistent and positive leadership for technology use in the teaching-learning process. In fact, they must be technology leaders. According to Hope, Kelly and Guyden (2000) technology leadership involves both understanding the technologies and how they can be applied to accomplishing tasks. In a study that examined the role of administrators in the integration of technology into the learning environment of three United States school districts, Gibson (2002) stated that school principals must focus their energies on ten technology categories: existing practice, planning, curriculum, resources, staff issues, communications, support, obstacles, staff development, and implementation. In this way, principals need to understand the capacities of the new technologies, to have a personal proficiency in their use, and be able to promote a school culture which

encourages exploration of new techniques in teaching, learning and management (Schiller, 2003). Therefore, schools need leaders who can facilitate the change process and support a learning community for technology integration.

According to Fullan (2003), no successful large-scale change or school reform effort has advanced very far without the support of the school leaders. Similarly, Schiller stated that "principals have a key role to play in the facilitation of educational change" (p. 4). In his studies of the elementary school principal as a change facilitator for ICT, Schiller (2003) concludes that principals who take an active approach to innovation can foster an environment that has greater benefits for their students and staff. Hence, principals' awareness, understanding and use of ICT are essential for effective use of computers in the school (Smith et al., 1999). A school administrator needs to be familiar with ICT and know what to look for in the classroom if effective supervision, evaluation or support for a classroom teacher is to be made (Fleit, 2000). This view is supported by Hope, Kely and Guyden (2000) who noted that school leaders should use technology themselves, developing an awareness of how technology can be used and modeling the practice to the school staff. Similarly, Stegall (1998) stated that it is important for principals to use computers, to seek assistance and advice from experts, from a technology committee, visit other schools, brainstorm ideas and hire and train technology 'savvy' teachers. Therefore, successful ICT development within the school will require the leader to be aware of the possibilities and future development of technology and how the school might integrate these into teaching and learning.

Given the enormous potential of ICT to impact upon education, it is imperative that factors that influence the success of ICT integration efforts be explored. Many researchers have identified effective leadership as a key ingredient of, and vitally important to, the success of any innovation in education (Bennett, 1996; Fullan, 1993). In particular, Becker (1993) contends that leadership is even more critical for successful integration of ICT in schools today. Rieber and Welliver (1998) also recognize that effective leadership is needed to enhance the transformation of our education system by taking advantage of the potential of ICT. Others go so far as to say that the success or failure of integration efforts rests on the shoulders of school leaders (Salzano, 1992). Substantiating the view that leadership is a critical factor in ICT integration efforts, Lockard, Abrams, and Mary (1990) explain that ICT integration is an enormous task that entails considering many issues and making many decisions. Agreeing, Dede (1992) points out that as leaders influence, make decisions, provide support, and model behavior , the possible impact leadership can have upon successful ICT integration is obvious.

Transformational Leadership
Transformational leadership is seen as a promising form of leadership for advancing educational institutions because it can cause essential change, resolve major concerns, and create new paradigms (Banerji & Krishnan, 2000). Such a leader supports open communication which creates team motivation. S/he also helps build the confidence of her/his team members by providing necessary training and encouraging team building. Dimmock and Walker (2000) too affirm the link between team motivation and goal- setting and visioning. Teamwork then, calls for participatory leadership and proactive support for change (Walker & Dimmock, 2000). To this end, a transformational leader possesses the necessary drive to initiate and maintain transformational processes within the organization. S/he must be capable of articulating a convincing and realistic vision and focus others towards a new critical path. If required, the organization may need to be redesigned to support the transformation (Banerji & Krishnan, 2000).

Charbonneau (2004) noted that the popularity and attractiveness of this leadership style stems at least in part, from its consistent association with superior performance in a range of organizations. Transformational leaders facilitate the thinking of old problems in new ways. They are often capable of communicating a vision and mobilizing the energy necessary for change. Their behaviors and traits include empathy, the need for power, good rhetorical skill, intelligence, and the consideration for others. The effect of this leadership style is that it inspires or motivates followers, gains commitment from followers, changes attitudes and supports the goals of the individual and organization.

According to Schein (1992), the most intriguing leadership role in culture management is one in which the leader tries to develop a learning organization that will be able to make its own continuous diagnosis and self-manage whatever transformations are needed as the environment changes. The learning leader must exhibit the self-confidence that active problem solving leads to learning and thereby set a suitable example for other members of the organization. The process of learning must eventually be made part of the culture and not seen as any given solution to any given problem (Schien, 1992).

Despite its limitations, there are certain elements of transformational leadership which do lend themselves to educational and ethical consideration. It appears to be very important for leaders and educators to have a clear vision of what they want to achieve and how they want to achieve it. Moreover, when its heroic implications are

reduced or eliminated, transformational leadership can advocate for processes that involve the contributions of all parties, rather than being a matter of one person "doing leadership" to others (Bottery, 2004, p. 19). Future leaders will be their ability to instill a learning mindset into their organization. The upcoming generation of leaders will have to be a generation of learning evangelists by highlighting the importance of learning and establishing a context where employees want to and are able to learn. Corporate leaders will have to be more capable of strengthening their organizations for future challenges and increasing competitive and innovative abilities (Brown & Posner, 2001).

Educational professionals are being objectified and stratified into leaders and followers according to neo-liberal versions of the performing school. Leadership is being defined as particular tasks and behaviors that enable those who are responsible and accountable for learning outcomes and measures of school improvement. However, this objective definition of leadership does not float free of organizational and personal histories that also shape and enable agency, and how real people with real lives struggle within and through the contradictions that challenge their values (Gunter, 2001).

According to Northouse (1997), one of the best styles of leadership is transformational leadership that can change and transform individuals. Transformational leadership occurs when one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality (Burns, 1978). An important goal of a transformational leader is to develop followers beyond their potential (Lee, 2005). Hence, transformational leaders try to develop and satisfy the higher-order needs of followers to gain their followers' commitment to the organization (Rowden, 2000).

The concept of transformational leadership has acquired wide popularity among leadership researchers during the past decade (Lowe, Kroeck et al., 1996) because of its qualitatively different approach to motivating followers as compared with other leadership styles (Howell & Avolio, 1993). Bass and Avolio (1994) described transformational leadership as being composed of four unique but interrelated behavioral components: inspirational motivation, intellectual stimulation, idealized influence, and individualized consideration. Several empirical and theoretical studies have found that leaders who display these four behaviors are able to realign their followers' values and norms, promote both personal and organizational changes, and help followers to exceed their initial performance expectations (Jung & Avolio, 2000). Therefore, transformational leader is noted as one of the most important factors affecting the integration of educational technology and has input into all the essential conditions that promote the integration of educational technology (Brooks-Young, 2002; Ross, McGraw & Burdette, 2001).

Transactional Leadership
Transactional leaders focus on the interpersonal exchanges that occur between themselves and their subordinates. Bass (1998) argued that transactional leaders are motivated by what is easily identifiable and measurable. According to Bass (1985), transactional leaders are more reactive than proactive; less creative, novel, and innovative; more reforming and conservative; and more inhibited in their research for solutions. Yukl (1999) postulated that transactional leadership includes a diverse collection of mostly ineffective leader behaviors that lack any clear common denominator. Lowe and Galen (1996) reported that transactional leaders operate within an existing system, avoid risk, prefer effective answers and are less likely to support the status quo. Bass and Avolio (2004) delineated the following key aspects that include transactional leadership.

- Contingent Reward – providing others with assistance in exchange for their efforts; discussing in specific performance targets; and making clear what subordinates can expect to receive for their efforts and expressing satisfaction when subordinates meet expectations.

- Management by Exception (active) – focusing attention on irregularities, mistakes, exceptions and deviations from standards; closely monitoring failures and punishing subordinates for their failures; and anticipating problems and making changes before those problems become too bothersome.

- Management by Exception (passive) - failing to intervene until problems become serious; avoiding specifying agreements, clarifying expectations and providing goals;

- Laissez – Faire – showing a total absence of leadership ; avoiding getting involved when important issues arise ; being absent when needed ; avoiding making decisions ; and delaying response to urgent questions subordinates are given.

Burns (1978) espoused that transactional leaders motivate followers by appealing to their self-interests and needs. In order for this exchange to occur, goals and objectives, as well as contingency rewards and inducements; must be offered.

Researchers have sought to identify which leadership style or which elements of particular leadership styles can be linked to positive outcomes such as job satisfaction, follower motivation, and organizational performance. The body of literature in this field is vast; Judge and Piccolo performed a meta-analysis of 626 correlations from 87 sources to relate transformational, transactional, and laissez-faire leadership characteristics to the aforementioned outcomes (Judge and Piccolo, 2004). Their findings support a link between effective leadership and all dimensions of transformational leadership (idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration), as well as a single dimension of transactional leadership, contingent reward. Though transformational and transactional leadership are often presented as being at opposing ends of a spectrum, a combination of select elements from both leadership styles may yield the best results.

Cultural Perceptions

In the headlong drive to incorporate educational technology in schools, the accommodation of the new tools has often taken precedence over the end-users' cultural perceptions toward the media. Many researchers have cautioned about the current lack of attention to cultural beliefs and their impact on ICT adoption in developing countries (Loch, et. al., 2003; Hill et. al., 1998). Researchers suggest that force-fitting the culture to the technology can create an unfavorable climate for the acceptance of ICT in different organizations in the importing country. In fact, Hill et. al. (1998) asserts that, unless taken into consideration, socio-cultural factors may put ICT transfer at risk in certain developing countries. Apparently, the changes developing countries are opting for cannot be attained by simply placing more computers in their schools. Martinez (1999) suggests that one of the major challenges facing developing countries is to make technology an essential part of the culture of the people. In fact, the reverence with which technology is held in technologically developed countries may be in contradiction to the perceptions of cultures that are relationship-oriented (Roblyer, Dozier-Henry & Burnette, 1996: p. 9). Harper (1987, p. 47) contends that cultural factors play an important role in creating negative perceptions toward computers: "One direct cultural cause is people's apprehension that life is becoming too mechanized, so they resist contributing to a "computer culture."

The study of cultural perceptions has been found essential for accounting for teachers' overall attitude toward ICT and for anticipating their future adoption of the new tools (Thomas, 1987; Harper, 1987). In fact, Chen, et. al. (1999) considers cultural perceptions among five main factors that may determine ICT adoption by educators. Unfortunately, however, only a few studies have tried to study the impact of cultural perceptions on the reception/rejection of ICT in education. Apart from the effect of the national culture on technological diffusion in schools, the micro-culture of the school itself may affect such diffusion (Hodas, 1993). Williams-Green, et. al. (1997) contends that the culture developed within an institution or within an organization can act as a barrier to change. For a new technology to be placed into an organization's culture there must be a match of organizational and technological values (Hodas, 1993). Within the school organization, if the technology is not received well by teachers, there must be a mismatch of values between the culture of schools and that of the technology. Watson (1998) found that teachers' inability to negotiate the role of the computer in their practice resulted in their resistance to its use in their classrooms. Therefore, he warned that the mismatch between the culture of techno centric mindedness and the teachers' pedagogic culture results in the alienation of the teachers from the use of technology. On the other hand, Coppola (2000) found that because the norms of school and community encouraged innovation and autonomy, teachers learned not only how to use computers in their teaching but also how to operate them within the constructivist framework. It seems that the integration of ICT in schools cannot be effective unless escorted by supplementary programs that would foster a culture of acceptance amongst teachers, students, and administrators.

From both theoretical and empirical perspectives, cultural perceptions seem to have a significant impact on teachers' adoption of ICT. Unfortunately, much of the early research on computer uses in education has ignored teachers' cultural perceptions toward the new machines (Harper, 1987). Studies focused on the computer and its effect on students' achievement, thus overlooking the psychological and contextual factors involved in the process of educational computerization (Clark, 1983; Thompson, Simonson & Hargrave, 1992). The delicacy of this situation calls for an investigation of teachers' cultural perceptions regarding the introduction of ICT into their schools and society at large.

THE STUDY

In view of the current state of the literature, this study explores how leadership affects the use of ICT in schools. Specifically, it determines the extent to which Malaysian principals use ICT in their schools and identifies their perceived ICT competencies and their leadership style. These are empirical questions, and we provide some preliminary findings for supporting the efficacy of our expectation.

METHODOLOGY

This was a descriptive study of an exploratory nature. Creswell (2003) suggests that exploratory studies are most advantageous when "not much has been written about the topic or the population being studied". The target population in this study was secondary school principals in the state of Selangor and Wilayah Persekutuan, Malaysia during the 2011-2012 school years. The list of school principals was based on the school principal's directory by Ministry of Education. In this study, a quantitative method was employed to collect data from the population of secondary school principals in Malaysia. Using a survey instrument, quantitative data were collected from a random sample of 520 secondary school principals. The questionnaires are divided into two parts. Part A measures the perceived level of computer use by principals. Part B measures the principal's characteristics; perceived computer competence; and leadership style (transformational and transactional leadership). Face and content validity of the instruments were established by the panel of experts. Moreover, Cronbach's alpha was used to measure internal consistency and calculated via the SPSS 19.0 statistical package. The Cronbach's alpha coefficients for these scales were: Cultural Perceptions Scale=0.611, Transformational leadership style Scale=0.812, Transactional leadership style Scale=0.596 and Level of computer use Scale=0.917.

Findings

Of the respondents, 42% were males while 58% were females. About 14% (n= 5) of the respondents were 41 or younger, 45% (n=13) were within the 42-47 age range, 33% (n=9) were within the 48-53 age range, 8% (n=3) were 60 or older. Participants' responses on their work experience showed that 38% of them had less than 19 years of experience, 42% were between 20 and 25 years, 17% had 26-31 years and 3% had more than 32 years. More than half of the respondents (>70%) held bachelor degrees, 27% held Masters' degrees, and about 3% held a Doctorate degree. Nearly 90% respondents owned a home computer. Moreover, all of the respondents reported that they have had computer training.

DISCUSSION

Computer Use by Principals

It can be seen from Table 1 that principals' perceptions of the level of computer use were moderate; with an overall mean score of 3.29. Also, findings showed that principals spent a few times a week working on their computers. It would seem that Malaysian principals need effective and extensive trainings to raise their proficiency in computer use and integrate technology into their schools. Training needs to be ongoing so principals can continue to learn how to use hardware and software applications within the context of their administrative and instructional responsibilities (Brown, 2001).

Table 1: Percentage, Mean and Standard Deviation of Computer Usage

Scale	Percent (%)			Mean	SD
	Low	Moderate	High		
Internet Use	10.1	44.2	46.7	3.49	0.78
Hardware & Software Use	11.7	49.8	43.2	3.27	0.67
Instructional Use	17.6	37.2	44.1	3.36	0.89
Administrative Use	17.2	49.1	36.3	3.19	0.93
Overall Computer Use	12.1	54.2	32.5	3.29	0.79

Leadership Style

Transformational leadership

As a composite variable, transformational leadership (refer to table 2) received a mean rating of 2.79 (on a five-point likert scale). Bass and Avolio (1990) suggested that ideal ratings for the transformational variables should be greater than three (>3.0). Principals did not meet this benchmark. Moreover, we found that a representative sample of Malaysian secondary school principals provided fairly often some elements of transformational leadership. This result suggests that some professional development programs should be provided for principals. In fact, if Malaysian principals want to initiate and implement school change through the use of information and communications technology, they must be eager to model the transformational components of charisma

(idealized influence), inspirational motivation, intellectual stimulation and individualized consideration in their schools.

Table 2: Mean and Standard Deviation of the Transformational Leadership Style

Scale	Mean	SD
Idealized influence (attributed)	2.97	0.68
Idealized influence (behavior)	2.87	0.67
Inspirational motivation	2.69	0.79
Intellectual stimulation	2.56	0.83
Individualized considerations	2.86	0.71
Overall Transformational leadership style	2.79	0.62

Transactional leadership

Descriptive analyses revealed that the respondents (refer to table 3) have a mean score of 2.38 (SD=0.31). It seems that principals display sometimes some elements of transactional leadership. In other words, this result suggests that principals sometimes tend to focus on task completion and teacher compliance, rely quite heavily on organizational rewards and punishments to influence teacher performance, and emphasize work standards, assignments, and task-oriented goals (Bass, 1998).

Table 3: Mean and Standard Deviation of the Transactional Leadership Style

Scale	Mean	SD
Contingent reward	3.13	0.55
Management-by-exception-active	2.89	0.62
Management-by-exception-passive	1.12	0.59
Overall Transactional leadership style	2.38	0.31

Cultural Perceptions

Participants were asked to respond to 10, likert scale type questionnaire dealing with their perceptions about computers' cultural relevance to and impact on Malaysian schools. Cultural perceptions were represented by a mean score on a 5 point likert scale where 5 (strongly agree) represents the maximum score of the scale and 1 (strongly disagree) represents the minimum score. Table 4 illustrates the frequency of respondents' feedback to the cultural perceptions scale.

Table 4: Frequency Percentages on the Cultural Perceptions Scale

N	Cultural Perceptions Scale	SD (%)	D (%)	N (%)	A (%)	SA (%)
1	Computers will not make any difference in our classrooms, schools, or lives	23.3	50.7	17.3	7.9	0.8
2	Principals need to know how to use computers for their future jobs	1.1	3.3	9.7	60.6	25.3
3	Students prefer learning from teachers to learning from computers	2.8	28.3	39.1	23.6	6.2
4	Knowing about computers earns one the respect of others	0.5	13.7	21.3	48.9	15.6
5	We need computers that suit better the Malaysian culture and identity	2.5	3.4	8.7	63.1	22.3
6	Computers will improve our standard of living	2.5	6.1	8.7	50.4	32.3
7	Using computers would not hinder Malaysian generations from learning their traditions	0.5	3.3	8.2	59.7	28.3
8	Computers are proliferating too fast	16.7	31.1	29.7	16.1	6.4

| 9 | People who are skilled in computers have privileges not available to others | 1.3 | 12.9 | 21.3 | 48.9 | 15.6 |
| 10 | The increased proliferation of computers will make our lives easier | 0.5 | 6.1 | 8.7 | 53.5 | 31.2 |

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

From a school culture perceptive, the majority of the respondents agreed or strongly agreed that school principals need to know how to use computers for their future jobs (85.9%), and that the increased proliferation of computer will make our lives easier (84.7%). Also, a high percentage of the respondents disagreed or strongly disagreed with the negatively stated item 1, indicating that computers will make difference in their classrooms, schools, and lives (74%). However, a high percentage of them (39.1%) were neutral about whether or not students prefer learning from teachers to learning from computers. From a national culture viewpoint, the majority of the respondents agreed or strongly agreed that knowing about computers earns one the respect of others (64.5%), contribute to improving their standard of living (82.7%), and computers would not hinder Malaysian generations from learning their traditions (88%).

As can be seen from Table 5, the overall mean on the cultural perceptions scale was 4.0, with a standard deviation of 0.53, indicating that principals' perceptions of the cultural relevance of computers were positive. In other words, principals had positive perceptions of the value, relevance, and impact of ICT as it relates to the cultural norms in Malaysian schools. So, principals did not feel ICT as a threat for Malaysian culture.

Table 5: Percentage, Mean, and Standard Deviation of the Cultural Perceptions

Scale	Percent (%)			Mean	SD
	Negative	Neutral	Positive		
Cultural Perceptions	0.0	26.7	73.2	4.00	0.53

The Relationship between the level of computer use by principals and the Independent Variables
The association between computer use and independent variables were explored by using the correlation analysis. The Pearson Product-moment was performed to identify independent variables that individually correlate with the dependent variable. The correlation matrix shows a number of significant relationships between level of computer use by principals and the independent variables (Table 6).

Table 6: Summary of the Correlation Matrix of Independent Variables and Computer Use

Variable	Pearson Point-Biserial/ Correlation	Sig. (2-tailed) Biserial Correlation
Computer Use	1	
Cultural Perception	0.47**	0.000
Transformational Leadership	0.63**	0.000
Transactional Leadership	0.14	0.08

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

Cultural Perceptions and the Level of Computer Use
The relationship between cultural perception and the level of computer use was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a moderate and positive correlation between the two variables [r =0.47, n=520, p<0.05], indicating that as principals' perceptions of the value, relevance, and impact of computers as it relates to the cultural norms in society and school increase, level of computer use will improve as well. As shown in Table 6, the p-value was smaller than the alpha value (p = 0.0001 < 0.05) so it can be concluded that there was significant relationship between cultural perception and level of computer use at 0.05 level of significance. The study's results are consistent with Rogers' premise regarding the role of social norms in the diffusion of innovations, and also with Thomas's "Cultural Suitability" hypothesis, which posits that the acceptance of a new technology depends to a large extent on its compatibility with the existing culture. Specially, principals in this study acknowledged the importance of ICT for their educational system and society. It reflects the influence of their cultural norms on their perception of ICT.

Transformational Leadership and Level of Computer Use

According to Table 6, there was a moderate and positive correlation between the two variables [r =0.63, n=520, p<0.05], indicating that as the level of principals' transformational leadership increase, their level of computer use will improve as well. Also, the findings showed that the p-value was smaller than the alpha value (p = 0.0001 < 0.05) so it can be concluded that there was a significant relationship between transformational leadership style and level of computer use by principals at 0.05 level of significance. This result suggests that transformational leadership has a positive effect on the level of computer use by principals. In this way, the applicability of the transformational leadership to information technology projects was well supported by the results of this study.

Transactional Leadership and Level of Computer Use

The relationship between transactional leadership and level of computer use was investigated using Pearson product-moment correlation coefficient. Based on r = 0.14, there was negligible relationship between transactional leadership and level of computer use. This result implies that transactional leadership style cannot influence the level of computer use by principals. This result is consistent with Leithwood's (1994) arguments that transactional practices alone do not lead to systematic improvement and benefits in transactional leadership can only be seen when paired with characteristics of transformational leadership.

CONCLUSION

This paper raises some issues about the role of principals in technology integration, determines the extent to which Malaysian principals use ICT in their schools and identifies their perceived ICT competencies and their leadership style. Findings indicate that principals are using computers two or three times a week for a variety of instructional and administrative tasks. In fact, if Malaysian principals want to be successful for their new role as technology leaders, they must understand the role of ICT in their work life and acquire appropriate skills to use this knowledge. In other words, they must be proficient in utilizing the computer to assist in administrative and instructional functions. For example, they should understand word processing, how to construct and report from a data base, how to use a spreadsheet to solve financial problems, how to create reports and link them with a mail-merge package, how to create and maintain files on a disk, how to use hardware available in their district, and how to use specific applications programs in use in their school.

Hence, principals should use of technology and realize the role that technology can play in teaching and learning process. Successful adoption of computer is important for school principals who must use computers and model their use for their staff (Tiede, 1992). If this modeling is successful, the staff may then model the use of computers for students. In this way, principals who do not have positive expectations for computer use or do not instill or support a culture of technology use; integration is inhibited (Anderson & Dexter, 2000). Therefore, principals should have knowledge, skill and positive attitudes towards implementing ICT in schools and also they must know new administrative techniques to manage their schools effectively.

In the age of technology and information, Malaysian principals should become competent in using computers. They should use computers effectively to perform their daily responsibilities. In fact, their ability to use computers helps them become more effective managers in using and analyzing the information that is available to them. The effective use of the computer in management, communication, and decision-making can increase their accountability. Findings of this study indicated that Malaysian secondary school principals are lacking in proficiency on database, spreadsheet, presentation/ multimedia software, the Internet, and information seeking as compared with other technology competencies. Hence, school districts and principals' centers should provide professional development for principals to become proficient in all the competency areas. Also, they should implement an evaluation system that ensures school principals are working with the technologies at a proficient level.

It is also imperative that the Ministry of Education comes up with policies that will guide the use of ICT in schools. The government seems to be lagging behind because whereas computer studies has been introduced in secondary schools as part of the national curriculum, it has not kept up with the provision of the necessary infrastructure both physical and human resources. For example, there has been no teacher training course with computer studies as a teaching subject. ICT therefore seems to have been left to the ingenuity of the schools. This may explain the low levels of ICT integration among classroom teachers and the apparent advantage that schools with a principal who has ICT knowledge have. The principals have therefore a professional responsibility and accountability to ensure that they are well trained in ICT and that their institutions have management strategies to enable them to achieve appropriate ICT integration in teaching and learning. At a time when information and communication technologies are being integrated into the classroom as learning tools, and

when teachers are being asked to incorporate technology into their teaching practices, principals who are more competent in ICT are more likely to achieve success in their schools.

Attention to cultural beliefs and their impact on ICT adoption are very important in developing countries (Loch et. al., 2003) because socio-cultural factors may put ICT transfer at risk (Albirini, 2006b)."Duplicating strategies from other developed countries without any consideration about cultural adaptations of technologies might be less effective and successful" (Kousha & Abdodi, 2004, p.8). According to Awamleh and Gardner (1999), implementation of a new technology is not finished with installation of the technology and explanation of how to use it. In fact, the new technology should be accepted by the receiving society (Asemi, 2006). It must not contradict the values of society. Findings from this study indicated that principals had positive cultural perceptions of ICT in society and school. Such principals could use technology and create a suitable environment and culture to the integration of technology in schools. This cultural perception relates the principals' success to their individual ability to articulate and influence norms and values. Hence, understanding the cultural values is as important as understanding the technological benefits. Principals who are responsible for adopting and implementing technology in school must be aware of its societal and organizational cultural impacts.

LIMITATIONS
Although we have found several encouraging results, it is important to recognize that the current findings also have limitations. First, the sample size should be increased because using data from a larger number of respondents will permit more powerful findings. Second, participants of this study completed a self-reported instrument. Given the self-reporting nature of this instrument, it was quite possible that principals overrated their proficiency or underrated their proficiency. These ratings may not reflect the true proficiency levels of the principals. In spite of these limitations, this study will be useful for policy makers, providers of professional development programs for principals and for system level decision makers to support mechanism and strategies to assist principals to develop their knowledge, skills and their leadership style. Thus, principals will understand the critical role that they play in facilitating the implementation of ICT in schools to improve teaching, learning and administrative processes. Therefore, we need leaders, not bosses, who help us develop a clearer vision and shed light in the moments of dark confusion (Wheatley & Margaret, 1992).

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EFFECT OF SCREEN READING AND READING FROM PRINTED OUT MATERIAL ON STUDENT SUCCESS AND PERMANENCY IN INTRODUCTION TO COMPUTER LESSON

Murat Tuncer
Department of Educational Sciences, Fırat University, Turkey
mtuncer@firat.edu.tr

Ferdi Bahadır
Erzincan University
fbahadir@erzincan.edu.tr

ABSTRACT
In this study, the effect of screen reading and reading from printed out material on student success and permanency in Introduction to Computer Lesson is investigated. Study group of the research consists of 78 freshman students registered in Erzincan University Refahiye Vocational School Post Service department. Study groups of research consist of an experiment group and a control group. With a random selection 38 students were assigned as experiment group and 40 students were assigned as control group. In this manner, experiment group with 38 students used screen reading, and control group with 40 students used printed out material for education. Study was designed as control group model with pretest and posttest. Both experiment and control groups were applied pretest and posttest within the research. In process of data analysing, ancova and multiple variance analysis were used. It was found on success tests that there is not a significant difference between posttests corrected according to pretests of control and experiment groups. But, a significant difference between Access and permanency tests in favour of control group was found. Furthermore, dual effect of applied method and gender on posttest success scores and delayed test scores was found to be insignificant. Results of the studies show that reading from printed out material is more efficient than screen reading.

Keywords: Screen Reading, Reading From Printed Out Material, Student Success, Introduction to Computer Lesson

INTRODUCTION
While emphasizing the importance of technology, recent research suggests educating new generations in harmony with technology. This research may be an eligible aspect because technology simplifies many aspects of our lives. It can be said that except for some small tribes, human beings do not find technology strange but are willing to follow it. This tendency to follow technological developments over time made it easy for technology to be used in every aspect of life without being questioned enough.

One of the areas where technology is used without questioning is education. It can be seen that these technologies began to be used as computer and internet technology became more widespread so that students see the internet as the main or first source of information (Tuncer, Yılmaz and Tan, 2011; Tuncer and Kaysi, 2011). As the internet became more widespread, acquisition of knowledge through books or the library became rare (Tuncer and Balcı, 2013). In a major change, learning from cyber media called "screen reading" is more preferred.

Güneş (2009:317) describes screen reading as; reading from screen with pages divided half or quarter the size of printed out materials. These electronic scripts on the computer screen go from pages to other pages as in entering a room in which multiple doors for other rooms exist (Aysever, 2004). This structure is discussed as an aspect of learning in many studies but taking some precautions is suggested for efficient learning. Because as Güneş (2010) and Altun and Çakmak (2008) suggested, comprehension of scripts in order gets harder due to loss of visual on other parts of pages as you read another part, the use of foreign characters making it hard to understand the words, use of reading techniques getting hard and the lack of beginning and ending pages.

Çelik (2006) sees reading as a complex process with physiologic, mental and spiritual aspects like comprehension, analysis and evaluation of feelings and thoughts in the text. According to Günay (2004:23) reading, regardless of its structure, in a text in which words are connected in a meaningful way is looking for connections to explore and express the unity of words or sentences, connecting the words together in order to

find a different meaning than original word meaning and making it meaningful. This expression on reading is the reason why screen reading is a matter of discussion. As texts slip from screen in screen reading, it becomes hard to make a meaningful relationship between the beginning and the end of the text. As screen size is different than page size, it is impossible to see full page and only small parts of page are visible. Maybe this is why some learners prefer reading from printed out materials in earlier studies (More, Guy and Elobaid, 2007; Alshaali and Varshney, 2005; Annand, 2008; Weeks, 2002; Spencer, 2006; Vernon, 2006).Johnson (2000) stated that a successful reader gets bored of simple texts and weak readers give up reading non fluent texts which he/she cannot read. Moreover, Guy and Elobaid (2007) stated that despite the fact that people are spending more time on the computer, they prefer to read texts with more than 3-4 pages on printed out material. Similar findings were stated by Vernon (2006); giventhe opportunity, the primary learning strategy of students is to print online documents. Spencer (2006) also noted that students prefer printed out material. Annand (2008) reports from Mercieca (2004) that screen reading keeps less information in mind for longer time. Weeks (2002) states that people reading from screen are not happy with this and they believe that screen reading would never be popular.

Alshaali and Varshney (2005) stated that reading from a computer screen is 20-30%slower than reading from printed out material and thus text should be 25%shorter. The finding that screen-reading is slower was also obtained by Muter et al., (1982), Gould and Grischkowsky (1984), Belmore (1985), Smith and Savory (1989), Muter and Maurutto (1991). In their study, Dyson and Haselgrove (2001) found that screen-reading reduces reading speed. Rose (2011) notes that opponents of screen reading went so far as to argue that "electronic text ultimately diminishes both personal growth of individuals and the stability of our society (Vandenhoek, 2013). In some other studies, various correlations between reading rate and comprehension were identified. According to Poulton (1958) and Belmore (1985), with the increase of reading rate, individual's level of comprehension decreases. However, for those having natural habit of fast reading, comprehension level of screen-reading is high. Yıldırım et. all (2011) on the other hand, stated that electronic text would be more advantageous than reading from printed out material because of benefits like screen size and screen resolution. Walczyk et al., (1999) found that mild time pressure, encouraging people to read slightly faster than normal from screen, can improve comprehension. Mallett (2010: 143) stated that screen size between A4 and A5 makes it easier to read. Wilson (2003) finds bigger screen size important for reading in order to have a full visual, but states that this also has a negative effect as it brings physical weight along. In some studies (Reinking, Mckenna, Labbo & Kieffer, 1997 and Tuman, 1994; Cit. Maden, 2012), it is emphasized that electronic literacy or reading-writing activities should not be regarded as an alternative to traditional reading-writing, but should be considered as a complementary.

All these research findings cause a cautious attitude towards screen reading. For this reason, screen reading should be investigated in various aspects like planning and effect of it on success. This research was planned with this need in mind. The effect of screen reading and reading from printed out material on learner's success was investigated with experimental study. For this reason, introduction to computer lesson was given as both screen reading and reading from printed out material. According to this, the general purpose of the study could be stated as: the effect of reading from printed out material (Control Group) and screen reading (Experiment Group) on student success and its permanency. Within the context of this general purpose, sub purposes below are investigated.

- Is there a significant difference between posttest score averages corrected according to pretest of both groups
- Is there a significant difference between permanency test score averages corrected according to posttest of both groups
- Is there a significant difference between access scores of both experiment and control groups
- Is dual effect of applied method (reading from printed out material and screen reading) and gender on posttest success score significant?
- Is dual effect of applied method (reading from printed out material and screen reading) and gender on permanency test success score significant?

METHOD
In this research, Pretest-Posttest Control Group Model from experimental research patterns is used. Symbolic expression of the model is shown below (Figure 1); (Karasar, 2009: 97).

G_1	$Q_{1.1}$	X	$Q_{1.2}$	$Q_{1.3}$
G_2	$Q_{2.1}$		$Q_{2.2}$	$Q_{2.3}$

(G$_1$: Experiment Group, G$_2$: Control Group, X: Independent Variable,
Q$_{1.1}$ and Q$_{2.1}$: Measurement Before Experiment (Pretest),
Q$_{1.2}$ and Q$_{2.2}$: Measurement After Experiment (Posttest) ,
Q$_{1.3}$ and Q$_{2.3}$: Measurement After Experiment (Postponed Test)

Figure 1: Control Group Model with Pretest-Posttest

Karasar (2009:96) describes this pattern as randomly choosing one group as the control group and the other one as the experiment group which have nothing in common at the beginning.

Research was carried out on Erzincan University Refahiye Vocational High School Post Service freshmen students (78 students). Study groups of research consist of an experiment group and a control group. With a random selection (protecting class unity) 38 students were assigned as experiment group (II. Education) and 40 students were assigned as control group (I. Education). In this manner, experiment group with 38 students used screen reading, and control group with 40 students used printed out material for education.

The characteristics of the monitors used in this study are as follow: Screen size: 19 inch, resolution: 1440x900, Visual angle:160/160, Contrast rate: 700:1, Brightness : 300 cd/m2, colour scale:0.72, pixelPitch: 0.285x0.285.

In the study, an achievement test consisting of 50 items was prepared. This test was applied to 2nd class (first and second education) students (69) which are believed to have same qualities (received these classes before, having average academic success, having same physical environment in classes). Item analyses for 50 items were made within test. Item analysis results were compared with reference values given in Taşpınar's (2004:276-279) table 1.

Table 1: The Item Difficulty and Distinctiveness Values and Evaluation of These

P (Item Difficulty)	Evaluation
0,80 and above	Very easy item
Between 0,65-0,79	Easy item
Between 0,35-0,64	Mid-level item
Between 0,20-0,34	Hard item
0,19 and below	Rather hard item
r (Item Distinctiveness)	Evaluation
0,40 and above	Very good item
0,30-0,39	Good item, but may be improved
0,20-0,29	It should generally by corrected
0,00-0,19	It may be removed from the test, but should be corrected
(-) Negative	It should not be included in the test

Comparing these reference values and coverage of the test with values of item difficulty and item distinctiveness, 25 items were excluded. Item difficulty and item distinctiveness about raw success test are given in table 2.

Table 2: Item difficulty and item distinctiveness of Success Test before Experimental Process

Item	P	r	Item	P	r	Item	P	r
1	0,37	0,21	18*	0,39	0,16	35	0,76	0,37
2*	0,92	-0,05	19	0,53	0,74	36*	0,16	-0,11
3	0,42	0,21	20	0,61	0,26	37*	0,71	0,05
4	0,74	0,53	21	0,66	0,37	38	0,53	0,32
5	0,63	0,63	22	0,71	0,26	39*	0,03	0,05
6*	0,97	0,05	23*	0,45	0,05	40*	0,79	0,11
7*	0,68	-0,11	24	0,71	0,47	41	0,37	0,42
8*	0,13	0,16	25	0,79	0,32	42	0,21	0,21
9*	0,03	-0,05	26*	0,42	0,11	43*	0,32	0,11
10	0,71	0,37	27*	0,18	-0,05	44	0,82	0,05
11*	0,45	0,16	28*	0,68	0,21	45	0,82	0,37

12*	0,5	0,05	29	0,39	0,47	46	0,37	0,21
13*	0,68	0	30	0,71	0,37	47*	0,13	0,16
14*	0,92	0,05	31*	0,34	0,16	48	0,29	0,47
15	0,68	0,32	32	0,63	0,53	49*	0,16	-0,11
16*	0,16	0,11	33*	0,08	0,05	50*	0,66	0,16
17	0,47	0,63	34	0,61	0,47			

* The items removed from the test, P=Item difficulty, r =Item distinctiveness

As seen on table 2, items which have distinction lower than ,21 are excluded. With this information, a final success test consisting of 25 items was evaluated in means of typing and meaning.

Both experiment and control groups were applied pretest and posttest within the research. Achievement test is important to determine the efficiency of learning and permanency of learning for both methods (screen reading and reading from printed out material). In process of data analysing, Ancova and multiple variance analysis (Mancova) were used.

FINDINGS
Ancova analysis was used to determine whether there was a significant difference between pretest and posttest averages. In this context, descriptive statistics about posttest are given in table 3.

Table 3: Descriptive Statistics for Posttest Results on Groups

Groups	N	Average	Corrected average
Control	40	55.20	58.18
Experiment	38	58.84	55.69

When the table is examined, it is seen that experiment group posttest average is higher. But when success score averages of groups are checked, it is seen that some differences exist in success scores. Corrected success test average is 58.18 for control group and 55.69 for experiment group. In that respect, it is possible to say that control group success average is higher.

Experiment group pretest scores are higher than control group pretest results. Thus, when comparing posttest results, pretest results should be under control. For this reason, Ancova method was used to compare both groups. Ancova analysis of comparison between posttest results corrected according to pretest is given on table 4.

Table 4: Ancova Results of Posttest Scores Corrected According to Pretest.

Source	Sum of Squares	df	Mean Squares	F	p
Pretest	5312.395	1	5312.395	44.772	.000
Experiment-Control	106.239	1	106.239	.895	.347
Error	8899.058	75	118.654		
Total	14469.949	77			

According to Table 4, a significant difference between corrected average results of posttest compared to pretest was not noticed [F (1,75) =.895, p>.05]. The success of experiments is evaluated by simply Access Scores which are found by subtraction of pretest results from posttest results. Ancova test results of comparison between Access scores of both experiment and control group are given on table 5.

Table 5: Descriptive Statistics for Access Scores on Groups

Groups	N	Average	Corrected average
Control	40	12.50	10.34
Experiment	38	5.57	7.85

When average scores on the table are examined, it is seen that Access score of control group is higher. But it is also seen that success score averages have some differences. Average corrected success score is 10.34 for control group and 7.85 for experiment group. Ancova analysis of comparison between Access scores is given on table 6.

Table 6: Ancova Analysis Results of Access Scores

Source	Sum of Squares	df	Mean Squares	F	p
Experiment-Control	933,455	1	933.455	6.078	.016
Error	11671.263	76	153.569		
Total	12604.718	77			

According to results on table 6, there is a significant difference between average Access scores [F (1,76) =6.078, p<.05]. This difference is in favour of reading from printed out material group. Thus, it is possible that reading from printed out material is more efficient than screen reading.

Other purpose of this study is to compare permanence of information between experiment and control groups. In this manner, permanency of methods (Experiment-Screen Reading, Control-Reading from printed out material) will be revealed. Descriptive statistics of permanency test scores are given on table 7.

Table 7: Descriptive Statistics of Permanency Test Results on Groups

Groups	N	Average	Corrected average
Control	40	54.40	56.13
Experiment	38	55.21	53.59

When the table is examined, it is seen that experiment group posttest permanency average is higher. But when success score averages of groups are checked, it is seen that some differences exist in success scores. Corrected success test average is 56.13 for control group and 53.59 for experiment group. In that respect, it is possible to say that control group success average is higher. Ancova analysis of comparison between permanency test results corrected according to posttest is given on table 8.

Table 8: Ancova results of comparison between permanency test results corrected according to posttest

Source	Sum of Squares	df	Mean Squares	F	p
Posttest	13547.150	1	13547.150	608.509	.000
Experiment-control	122.983	1	122.983	5.524	.021
Error	1669.713	75	22.263		
Total	15237.179	77			

According to Table 8, a significant difference between permanency test averages corrected according to posttest was noticed [F (1,75) =5.524, p<.05]. LSD test applied on corrected posttest scores show that this significant difference is in favour of control group. Calculated effect size is η^2=.069.

Two factor Ancova analysis for irrelevant samples is used to investigate whether gender of students affected student success on applied method. Descriptive statistics of posttest scores according to teaching method and gender is seen on table 9.

Table 9: Descriptive statistics of posttest scores according to teaching method and gender

	Gender	N	$\bar{X}$	Std. Deviation
	Female	24	54,66	13,27
Control	Male	16	56,00	13,77
	Total	40	55,20	13,31
	Female	9	60,00	13,26
Experiment	Male	29	58,48	14,47
	Total	38	58,84	14,03
	Female	33	56,12	13,28
Total	Male	45	57,60	14,12
	Total	78	56,97	13,70

Posttest average of reading from printed out material group is X=55.20. Posttest average of screen reading group is X=58.84. Dual variance analysis was used to determine whether this difference between groups (Experiment-control) is significant and to determine whether the gender effect on posttest results is significant. Results about these 2 situations are given on table 10.

Table 10: ANOVA analysis Results of Teaching Method and Success Scores According to Gender

Source	Sum of Squares	df	Mean Squares	F	p
Experiment-Control	244,599	1	244,599	1,277	,262
Gender	,135	1	,135	,001	,979
ExpCont x Gender	32,534	1	32,534	,170	,681
Error	14178,575	74	191,602		
Total	14469,969	77			

According to the table, a significant difference between average posttest results of experiment and control group was not noticed (F (1,74) =1.277, p>.05). Furthermore, the mutual effect of applied method and gender is not significant [F (1.74) =.170, p>.05]. Line graph based on Method and Gender for this analysis is given on figure 2.
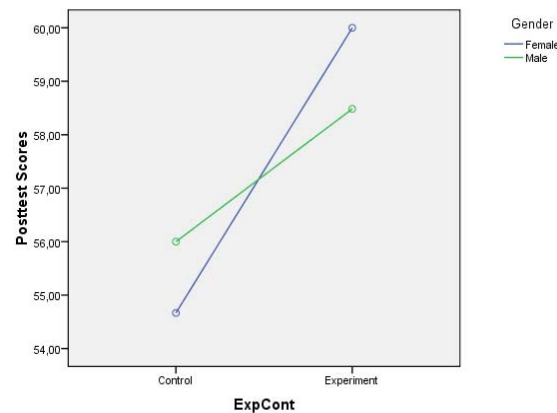
Figure 2: Method and Gender Based Line Graph

It is seen on figure 2 that female success average is 54.66 and male success average is 56.00 on control group. However female success average is 60.00 and male success average is 58.48 on experiment group. Apart from this, results on table 11 shows permanency test score averages.

Table 11: Descriptive Statistics of Teaching Method and Gender Based Delayed Test Scores

	Gender	N	$\bar{X}$	Std. Deviation
	Female	24	54,33	12,58
Control	Male	16	54,50	14,37
	Total	40	54,40	13,15
	Female	9	55,55	13,33
Experiment	Male	29	55,37	15,86
	Total	38	55,42	15,13
	Female	33	54,66	12,59
Total	Male	45	55,06	15,19
	Total	78	54,89	14,06

As seen on table 12, permanency test average of reading from printed out material group (control group) is X=54.40. Delayed test of screen group is X=55.42. Dual variance analysis is applied to determine whether this permanency test average difference between 2 groups is significant and whether the mutual effect of applied method and gender is significant. Results for these 2 situations are shown on table 12.

Table 12: ANOVA Analysis Results of Teaching Method and Gender Based Delayed Test

Source	Sum of Squares	df	Mean Squares	F	p
Experiment-Control	17,683	1	17,683	,086	,770
Gender	,000	1	,000	,000	,999
ExpCont x Gender	,471	1	,471	,002	,962
Error	15216,383	74	205,627		
Total	15237,179	77			

A significant difference between these two groups' delayed test average scores was not noticed (F (1,74) =.086, p>.05). Another finding on Table12 is that mutual effect of method (Experiment-Control) and gender on delayed test success scores is insignificant [F (1,74) =.002, p>.05].

RESULT, DISCUSSION AND SUGGESTIONS

Screen reading, as a result of technological advancements, is a situation which teachers and students will continue to encounter frequently. Since screen reading is becoming more widespread, it is of common interest whether screen reading or reading from printed out material gives better results on learning. Furthermore, clarification is needed for such an important question on learner success in which model would be higher. With this purpose in mind, a significant difference between pretest and posttest, corrected according to pretest, of both experiment and control groups researched. A significant difference between Access score averages which could be taken as a predictor was found. It is also noted that there is a significant difference between permanency test scores corrected according to posttests of experiment and control groups. According to LSD test, this difference is in favour of control group. Furthermore, dual effect of applied method and gender posttest success scores and delayed test success scores is found insignificant.

Results of the studies show that reading from printed out material is more efficient than screen reading. Similar results were found by Tuncer (2012) and reading from printed out material was found to be more efficient than reading from projected screen. As Gunes has stated before, this result may be caused by skipped reading from screen, reflections on screen, vertical movements of screen while reading and eye strain. Another finding supporting this position was noticed by O'Hara and Sellen (1997).They found that reading from printed out material is fast, comfortable and not tiring while screen reading is slow, lacking comfort and hard. Nielsen (1995) found that screen reading is 25% slower than reading from printed out material. Dyson (2004) stated that this deficiency of screen reading process is because of physical order of scripts read from screen. The finds of this study show a parallelism with those of Muter et al., (1982), Gould and Grischkowsky (1984), Belmore (1985), Smith and Savory (1989), Muter and Maurutto (1991), Dyson and Haselgrove (2001) in general terms. Kurniawan and Zaphiris (2001), in opposition to these results, state that there is no difference in speed between screen reading and reading from printed out material. Annand (2008) and Çetin (2007) also found results supporting this and stated that there is no significant difference between screen reading and reading from printed out material.

These research results show that reading from printed out material increases success. Conversely, it is thought that with better planning for both students and teachers, technology becoming more widespread and its contribution to education variability could be better. Screen readers should arrange surrounding environment's physical factors like light and colour in a way which would affect the reading process positively. It is thought that the benefits of changing paper size, font type and size would help the reading process. Especially students in elementary education level should be directed to read from printed out material as it is known that they are not suitable for screen reading (Ulusoy, 2011). Students with this level should not be left alone with a computer. Different specifications of electronic scripts and the way they are becoming more widespread should be considered and in education programmes screen reading should be included. It is thought that enriched presentations with the use of animation and figures instead of plain text could be efficient for visual memory and reduce the limitations of screen reading.

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ENHANCING A LOW-COST VIRTUAL REALITY APPLICATION THROUGH CONSTRUCTIVIST APPROACH: THE CASE OF SPATIAL TRAINING OF MIDDLE GRADERS

Khairulanuar SAMSUDIN
Computing Department, Sultan Idris Education University, Malaysia
khairul@fskik.upsi.edu.my

Ahmad RAFI *(corresponding author)*
Faculty of Creative Multimedia, Multimedia University, Malaysia
rafi@mmu.edu.my or ahmadrafi01@gmail.com

Ahmad Zamzuri MOHAMAD ALI
Multimedia Department, Sultan Idris Education University, Malaysia
zamzuri@fskik.upsi.edu.my

Nazre ABD. RASHID
Computing Department, Sultan Idris Education University, Malaysia
nazre@fskik.upsi.edu.my

ABSTRACT
The aim of this study is to develop and to test a low-cost virtual reality spatial trainer in terms of its effectiveness in spatial training. The researchers adopted three features deriving from the constructivist perspective to guide the design of the trainer, namely interaction, instruction, and support. The no control pre test post test experimental procedure was used as the research design involving a sample, which comprised a class of 35 middle graders (15 girls and 20 boys) with mean age of 15.5 years. The researchers hypothesized that there would be a significant improvement in spatial visualization after training and the three training attributes would receive different ratings from the participants. The research instruments used were Spatial Visualization Test (for pre-testing and post-testing) and usability survey questionnaire. The participants used the trainer for four consecutive weeks, with each session lasting for three hours. Data collected were analyzed using Statistical Package for Social Science (SPSS). Result of a paired samples t-test indicated that the participants had made significant improvement after training, thus supporting the first research hypothesis. However, the results of independent samples t-test did not support the second hypothesis, where all the three training features were rated equally. Interestingly, subtle but significant orientations were detected, where the instructive and interactive features were rated differently by girls and boys, respectively. The researchers also discuss the practical implications of the low-cost virtual reality application for spatial training by proposing a set of design guidelines.

Keywords: constructivist principles, instruction, interaction, low-cost virtual reality, support, spatial visualization.

INTRODUCTION

Virtual Reality (VR), a term coined by Jaron Lanier, has become a niche in selected fields, notably in military (Wilson, 2008), architecture and engineering (Mobach, 2008), avionics and entertainment industry (Craig, Sherman, & Will, 2009) Typically, this technology enables a user to interact with computer-generated, synthetic three-dimensional (3-D) environment through interactive devices, engendering a sense of presence (Coelho, Tichon, Hine, & Wallis, 2006). Users' movements are continuously tracked in real time by motion sensors, thus updating all the related sensorial feedback, notably visual input, that immerse them in the artificial world such as touring a virtual museum. What used to be a prohibitively expensive technology – mostly enjoyed by a few elite sectors – is now making inroads in other fields, notably educational domain. The wider VR adoption is made possible through advances in computing technology in terms of processing speed and multimedia capability, in particular desktop platform, which effectively lower the cost of ownership, making it possible even for a decent elementary school to own such a novelty. The appeal to use desktop VR in schools owes to its cost-effective implementation that can help teachers and instructors to improve pupils' learning achievements by capitalizing on cognitive and affective domains of learners (Lee, 2011). Evidence supporting the effective use of low-cost VR applications in challenging scenarios is also appearing gradually in the literature, where for instance, a case

involving several physically challenged patients who had received rehabilitative training managed to recover their motor ability successfully (Sung, Chiu, Chen, Tsai, & Henrich, 2011).

Lately, in the educational realm, desktop VR has been used to train students for a variety of reasons; however, one particular theme seems to dominate the studies, namely spatial visualization. One reason for this focus on spatial ability training may be due to its importance in engineering (Russell & Churches, 2010), science (Clement, Zietsman, & Monaghan, 2005; Wai, Lubinski, & Benbow, 2009) and mathematics (Presmeg, 2008). Once an obscured cognitive concept, spatial ability is now recognized to be one of the important intellectual constructs in humans. The imperative to study this ability is best captured through the world renowned educational psychologist Howard Gardner's book titled *Frames of mind: the theory of multiple intelligences*. Spatial intelligence is one the multiple intelligences that concerns one's ability "… to recognize and use the patterns of wide space and more confined areas" (Gardner, 1983 cited in Smith, 2008). Gardner's treatise asserts that educators should not only focus teaching on the development of linguistic and logical-mathematical abilities, but efforts should be invested to develop other abilities as well, including spatial intelligence (Smith, 2008). In addition to the term spatial intelligence, the literature is replete with many definitions (e.g., spatial thinking, spatial cognition, and etc.) that complicate discussions; however, all researchers agree that this ability is an amalgam of several interrelated sub-abilities or dimensions such as mental rotation, spatial visualization, and spatial perception (Linn & Petersen, 1985). Another focus of debates revolves around the nurture versus nature in the development of spatial ability, and the evidence gleaned over the years suggests that persons with poor spatial ability can be trained to improve their spatial skills through training (Alkan, 2011; Mohler, 2008; Rafi & Khairulanuar, 2009). These encouraging findings have a crucial implication in that low spatial skill pupils can be treated. In today's training realm that is dominated by electronic learning approach, gender factor is likely to favor boys than girls because the former have more experience and expertise in technology (Islam, M. A., Abdul Rahim, N.A., Liang,T.C. & Momtaz, H., 2011). In the context of training in virtual environments, boys may have greater advantage than girls because the former have greater familiarity with virtual stimuli, leading them to a greater acceptance of the virtual world (Felnhofer, Kothgassner, Beutl, Hlavacs, Kryspin-Exner, 2012). In view of these potential threats, training has to be based on appropriate design principles to cater the needs of users from a diverse background (Rafi & Khairulanuar, 2010). In this regard, any application to be used for spatial training should be guided by a theoretical framework to make it sound and worthy. Failing to adhere to any sound theoretical underpinnings to guide the development of training application may result in spurious learning rather than effective learning (Nworie & Haughton, 2008). In light of the issues discussed, the researchers undertook this study primarily to answer the following research questions as follows:
a. Will the participants' spatial visualization improve after training in the DVR trainer?
b. What are the participants' perceptions of the features of the DVR trainer?

To address the research questions, two research hypotheses were formulated as follows:
a. There will be a significant difference of the participants' spatial visualization before and after training.
b. Participants' perceptions of the constructivist features of the DVR trainer will differ significantly.

THE APPLICATION OF CONSTRUCTIVIST ELEMENTS IN THE DEVELOPMENT OF THE SPATIAL TRAINER
Emerging affordable technologies, such as desktop virtual reality (DVR), have been gaining wide acceptance by the training communities across the globe. Lately, DVR is getting more and more prominent due to the pervasive use of the universally accepted 3D scene format *Virtual Reality Modeling Language* (VRML) by the Internet communities worldwide that can create virtual environments that are deliverable over the World Wide Web (Beier, 2000). The wide adoption of this relatively low cost technology that runs on desktop computing platform has its reasons: improved processing power, enhanced graphics, and lower total cost of ownership. However, the use of this technology has to be carefully planned to optimize its capability. The use of the technology for training must be carefully considered in relation to two vital issues: one relating to the needs for appropriate level and style of contents; and the other relating to the needs to use the right software and delivery mechanisms (Beier, 2000; Fernie & Richard, 2003). More importantly, the development of any training application must be informed through current theories of learning to ensure that its implementation will be able to achieve its stated goals through optimizing the training or learning process (Hudak, 2007). In this study, spatial training to improve spatial visualization must be planned accordingly using appropriate or authentic tasks that tap on the required cognitive functions. Training must be designed such that it evokes spatial strategy – rather than analytical strategy – when solving spatial tasks. For this reason, the researchers developed the spatial trainer in the form of a 3D virtual environment, consisting of three features to foster effective training, namely spatial exercises, interactive 3D virtual objects, and feedback; the three elements were designed along the constructivist perspective that emphasizes on instruction, interaction, and support, respectively (see Table 1).

The appropriate use of training objects to be utilized was informed by reviewing the items of the psychometric test battery. Spatial ability tests have been developed by many cognitive psychology institutions to be utilized as part of intelligence and employment assessments. These tests possess strong validity and reliability measures for the cognitive-psychological constructs such as spatial visualization. Appropriate items of the tests were first reviewed, and then they were developed into training objects as part of the instructional materials that participants used for spatial training. A constructivist framework was used in the design of the training application based on the constructivist interpretations by Moshman (1982) in which he categorizes constructivism into three distinct classes: endogenous, exogenous, and dialectical principles. Firstly, endogenous principle stresses on individual nature of each learner's knowledge construction process relegating the role of teachers to facilitators. Secondly, exogenous principle underscores the formation and refinement of knowledge representations through learning by instructions with support from exercises entailing active cognition. Thirdly, dialectical principle espouses learning through realistic experience coupled with essential scaffoldings. In designing the trainer, the researchers conceptualized these three principles as being the interactive, instructive, and supportive features, respectively. These features serve as the theoretical underpinnings of the trainer that were realized in the DVR platform. Table 1 shows both the theoretical underpinnings (to guide the design of the trainer) and practical considerations (to help develop the trainer).

Table 1. The conceptual framework of the spatial trainer

Theoretical underpinnings:		Practical implementation aspects:		
Constructivist elements:	Attributes of training:	Essential features:	Enabler:	Enabling technology:
Endogenous	Individual nature of learner's knowledge construction process	*Interactive*	Training Scene: 3D objects and navigational tools	Desktop VR
Exogenous	Formation and refinement of knowledge representations	*Instructive*	Spatial exercises: Spatial Visualization	XML
Dialectical	Training through realistic experience coupled with essential scaffoldings	*Supportive*	Cognitive tool: Animations and Feedback	Desktop VR + XML

The spatial trainer provides a series of exercises to improve spatial visualization by solving spatial tasks consisting of 3D regular blocks (see Figure 1). Each exercise consists of a question with several options that are presented in textual format, and the 3D blocks are presented as virtual objects. Interactions with the 3D blocks are performed using a mouse-controlled DVR interface. Animations of the virtual objects are made available as a cognitive tool to assist users by providing them with correct spatial solutions. Feedback mechanism is also available to inform users the status of their responses. This feedback is vital because users can learn their current state of knowledge in order to lead them to develop new strategy for the next step of learning. Figure 1 shows a snapshot of the spatial trainer with the learning features as discussed.
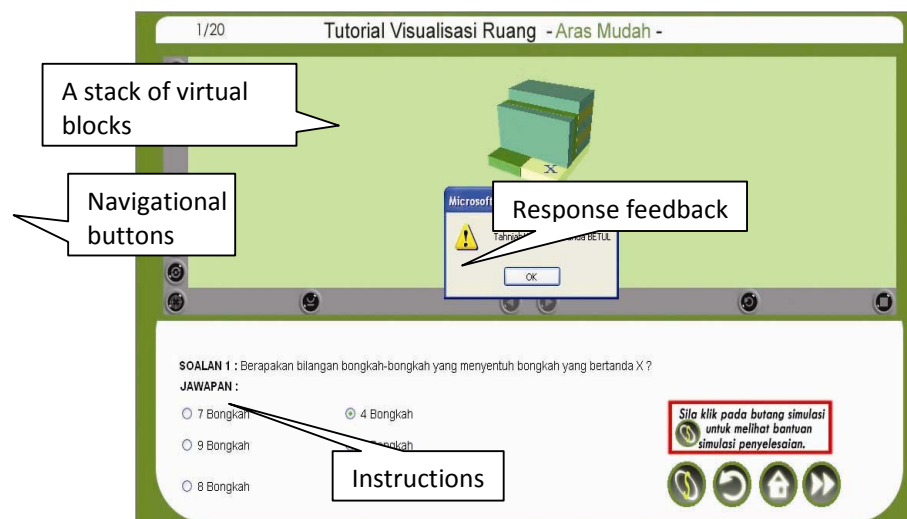
Figure 1. The spatial visualization exercise of the spatial trainer

RESEARCH METHOD

The research used a no control group pre post test research design and a survey research method to answer the first and second research questions, respectively. Details of the implementation of both research methods are as follows:

Participants

The sample of the study was derived by a convenience sampling involving a class of 35 middle graders whose mean age was 15.5 years. The sample comprised 15 girls and 20 boys who were average academic achievers. Their participation was secured through personal contact of the first researcher with their class teacher. The pupils were assured that they could drop out from the study at any time, if they wished to do so.

Training Application and Research Instruments

The training application used by the participants was the spatial trainer developed by the researchers as discussed. The spatial trainer contains a series of spatial exercises that are divided into three classes: low, moderate, and high levels of difficulty. The levels of difficulty are based on the density and configuration of the stacks of virtual block. The research instruments were the Spatial Visualization Test developed by the Mathematics Department of Michigan State University for the Middle Grade Mathematics Project (MGMP-SV) (1981) and the usability survey questionnaire developed by the researchers. The MGMP-SV comprises 32 multiple-choice items, each with five options. The test contains 10 different types of items. The types of representations used are as follows: (a) 2D- flat views, (b) 3D-corner views, and (c) a "map plan," which depicts the base of a building using numbers within squares to indicate the number of cubes to be placed on each spot. The reliability of this instrument is reasonably high, having Cronbach's alpha coefficients ranging from .72 to .88. The second research instrument contains 15 items, with 5 items to measure each of the constructivist features of the spatial trainer. Each question asked the participants to provide their level of agreement along 5-point Likert scales, ranging from '1' (*strongly disagree*) to '5' (*strongly agree*). Internal consistency computed for this instrument showed reasonable reliability, having attained a Cronbach's alpha coefficient of .77.

Procedure

The participants trained for 12 hours throughout the study, spread equally for four consecutive weeks. Spatial training was done with simple exercises in the first week, then followed by moderate exercises on the second week, and ended with complex exercises on the third week. Pre-testing and post-testing were carried out using the MGMP-SV, which was administered to the participants immediately before and after training to measure their spatial skills. The usability survey questionnaire was also administered to the participants after the training was completed in the final week.

FINDINGS

Data collected were analyzed by using the Statistical Package for Social Science, SPSS version 19.0 to provide both the descriptive and inferential statistics. For the measurement of spatial visualization before training, the participants attained a mean score of 16.26 (SD = 3.11), where the mean scores of the 15 female and 20 male participants were 16.13 (SD = 3.07) and 16.35 (SD = 3.22), respectively. For the measurement of spatial visualization after training, the participants attained a mean score of 21.60 (SD = 2.78), where the mean scores of the 15 female and 20 male participants were 21.13 (SD = 3.11) and 21.95 (SD = 2.52), respectively. Analysis based on *paired-samples t-test* showed that the difference between the pre- and post-measurements of spatial visualization was significant, $t(34)$ = 24.65, p = 0.001 (see Table 2).

Table 2. Means and std.deviations of the pre-test and post-test scores

| Gender | Spatial visualization test scores | | | |
| | Pre-test | | Post-test | |
	Means	SD	Means	SD
Females (*n*=15)	16.13	3.07	21.13	3.11
Males (*n*=20)	16.35	3.22	21.95	2.52
All (*N*=35)	16.26	3.11	21.60	2.78

Statistical analysis performed on data collected from the survey showed that for interactive feature of the trainer was reasonably high, the 15 female and 20 male participants ascribed mean scores of 3.27 (SD = .30) and 4.60 (SD = .68), respectively. In total, this interactive feature attained a mean score of 4.03 (SD=.98) from all the participants. For the supportive feature of the spatial trainer, the mean scores received from the 15 female and 20 male participants were 3.60 (SD = .74) and 3.55 (SD = .66), thus attaining an overall mean score of 3.57 (SD=.70) from all the participants. Likewise, for the instructive feature of the spatial trainer, the mean scores received from the 15 female and 20 male participants were 4.27 (SD = .80) and 3.45 (SD = .69). Thus, this

feature received an overall mean score of 3.80 (*SD*=.83) from all the participants. Table 3 below summarizes the findings of the rating received from all the participants pertaining to the three feature of the training environment.

Table 3. Means and std.deviations of participants' perceptions of spatial trainer's features

Gender	Training features					
	Interactive		*Supportive*		*Instructive*	
	Means	SD	Means	SD	Means	SD
Females (*n*=15)	3.27	.80	3.60	.74	4.27	.80
Males (*n*=20)	4.60	.68	3.55	.69	3.45	.69
All (*N*=35)	4.03	.98	3.57	.70	3.80	.83

A series of independent samples t-tests were also performed to determine whether there were significant differences among the ratings of the three features of the spatial trainer. The difference between the ratings of the interactive and supportive features was found to be non-significant, $t(68) = 1.24$, $p > 0.1$. Similarly, the difference between the ratings of the interactive and instructive features was found not significant, $t(68) = .29$, $p > 0.1$. Likewise, the rating of the supportive feature did not differ significantly from the instructive feature, , $t(68) = .22$, $p > 0.1$. In essence, the three features of the trainer were equally rated by all the participants in this study. The researchers also performed similar tests to detect significant differences among the three features across gender. There was a significant difference in the ratings of the interactive feature between female participants (Mean=3.27, *SD*=.80) and male participants (Mean=4.60, *SD*=0.68); $t(27)=5.20$, $p = 0.001$. Likewise, there was a significant difference in the ratings of the instructive feature between female participants (Mean=4.27, *SD*=.80) and male participants (Mean=3.45, *SD*=0.69); $t(28)=3.17$, $p = 0.01$. However, was no significant difference in the ratings of the suppotive feature between female participants (Mean=3.60, *SD*=.74) and male participants (Mean=3.55, *SD*=0.69); $t(29)=.20$, $p > 0.1$.

DISCUSSION

Before training, participants' spatial visualization was slightly above the average level; however, after training their spatial visualization improved significantly. Comparison of the difference between their spatial visualization before and after training showed that they had improved by almost twice the standard deviation of this spatial ability. Thus, this finding supports the first research hypothesis of the study, which demonstrates that this spatial ability is malleable to training. This finding strongly supports the use of DVR technology as an alternative technology, which is affordable and equally effective, that is comparable to other expensive cutting-edge technologies. More importantly, the finding reinforces the imperative of instructional design in the development of training applications. Laid on a strong theoretical foundation, training can become efficacious as learners will be cognitively primed in the appropriate 'frame of mind' to discover and utilize concepts related to a particular task being performed.

For the second part of the analysis, the finding of the inferential analysis indicates that all the three training features (i.e., interactive, instructive, and supportive attributes) were equally important on a moderate level as reported by the participants in the study. Hence, there is no evidence to support the second research hypothesis – all the three training features were deemed relevant without any element superseding the others. However, the comparison of these training features based on gender showed interesting results. In general, male participants tended to rate the interactive feature higher than their opposite counterparts. In this study, spatial training normally involved a series of steps to be performed by the participants: reading the instructions and questions (instructive feature), interacting with virtual 3D objects (interactive feature), and, when necessary, using animations (supportive feature) to show the correct spatial solutions. In addition, anecdotal evidence based on the authors' observation during training sessions indicates that male participants were engrossed in navigating the virtual environment. In contrast, female participants used the interface very cautiously, probably because of their inherent nature to be meticulous and vigilant before committing effort to carry out a task. In addition, this cautionary approach may also reflect poor navigational skill of female participants compared to male participants. This problem will be more pronounced as the spatial tasks in DVR environment become more complex, which will disadvantage female students (Ausburn, Martens, Washington, Steele, & Washburn, 2009), whereas males will be able to capitalize on such a setting given ample evidence that suggests the boys have greater familiarity and experience in computer-based media such as video games (Adamo-Villani, Wilbur, & Wasburn, 2008). For the instructive feature of the trainer, female participants rated this feature significantly higher than their counterparts. This finding suggests that information (in written form) is critical to female learners in performing tasks that require clear, precise instructions. Similar argument asserted previously (females being heedful to details) may also apply to partly explain the tendency of female learners to rate the instructive feature higher than male learners. This finding is hardly surprising given that female students, in

general, pay more attention to details and are more cautious than male students (Meit, Borges, Cubic, & Seibel, 2007). Finally, the supportive feature of the trainer (in the form of animations) was moderately and equally rated by both gender; thus, this feature provides cognitive scaffolding to learners irrespective of their biological background. This finding is congruent with Sanchez and Wiley's (2010) finding that showed animations had helped eliminate performance differences between girls and boys in learning scientific concepts. From the cognitive perspective, a solution being shown as an animation helps the learner to better construct their understanding through improved visual input. Based on the findings of this research, the researchers propose a set of design guidelines that may help instructional designers, multimedia developers, and trainers in the development of spatial training applications based on the DVR platform as explained below.

The guidelines for developing a desktop virtual reality trainer

i)   Determining the specific training in appropriate spatial ability dimension

The first step involves identifying the specific components of spatial ability that are required for training. This is important given the multi-facet nature of spatial ability consisting of several distinct but overlapping components. Failure to address this step may risk successful outcomes of spatial training as the training activities will be too generic rather than specific. This first stage is essential as it paves the way for instructional designers to search appropriate learning or training objects to be used by learners as required in the ensuing steps. As demonstrated in this study, training spatial visualization will entail specific objects that are not only unique but efficacious in enhancing the intended skills or ability.

ii)   Selecting the appropriate training objects for spatial training

There are a range of test batteries for spatial ability, namely mental rotation, spatial visualization, and spatial perception. Many items of spatial ability have been developed and tested that show high reliability and validity. Thus, using the test items as objects for spatial training will ensure spatial activities or tasks carried out by learners will tap on the precise mental reasoning for the construct to be trained or learned. This strategy of selecting training objects is not only reliable, but it can save time as developing new training objects is time-consuming and risky. The selected test items can be developed into training objects that can be interacted, animated, and interrogated during training to enrich the training experience. Hence, learners can become proficient and skillful in performing the intended tasks. In this research, the training objects were stacks of 3D regular blocks in virtual environment. Using the DVR interface, learners could navigate the 3D environment in many ways that will be perceived as rotations and translations, giving a sense of control and presence.

iii)   Developing the appropriate instructional approach for spatial training

The third step is a very critical stage in determining the appropriate instructional and/or pedagogical approach to be employed in training. Identifying the proper instructional training setting at this stage will require an understanding of current theory of learning. There are several learning theories and their numerous variants, but essentially they can be categorized along a continuum of two opposite poles, namely instructivist and constructivist perspectives. Experience gained from the research suggests using a mix of the two paradigms where the former can help develop focused training activities through clear training goals and instructions, while the latter can help learners in knowledge construction through active participation in the training process. At this stage, the researchers propose the following steps, which involve the development of the appropriate instructions, organization of training units, and sequence of training tasks as listed below.

a.   Developing clear, precise instructions to be followed by the learners prior to engaging spatial exercises will entail communicating and explaining the training objectives that learners should focus on in order to achieve those goals after the completion of spatial training. Having a clear understanding of what learners are expected to achieve after training will help them concentrate on the spatial tasks to be solved.

b.   Organizing the training objects into training units with appropriate instructions that are structured and ordered will need careful analysis of the spatial tasks in terms of the level of difficulty. Then, questions should be crafted carefully that ask learners to derive the solutions by making use of the training objects. Ideally, training units or modules should be categorized into simple, moderate and complex spatial tasks.

c.   Sequencing the tasks of spatial training will entail solving the simple tasks first, then progressing to the moderate tasks, and finally completing the complex tasks. The duration of the spatial training for the tasks will not necessarily be the same because the degrees of difficulty of the tasks are different. Some spatial training may need more time to practice, particularly for tasks where performance measures are not only based on accuracy but also speed or reaction time in solving the spatial problems.

i) Developing the appropriate environment for spatial training

The fourth step of the design process entails the creation of an environment for spatial training that can transform the spatial tasks containing training objects into a convenient form. There are important technological and financial considerations at this stage as developing a particular training environment needs to intricately balance these two main factors. The level of sophistication of training application will affect the cost of procurement and ownership, whhich can be prohibitive for schools. The experimental research of this study demonstrates that even a low cost training application can be effective for spatial training that is applicable in school context. In this research, a desktop virtual environment was created containing 3D objects, navigation interface, text-based instructions, and animations. The effectiveness of any training application is not solely dependent on the degree of technology wizardry, but instructional strategy plays a crucial role in training.

ii) Establishing the level of sophistication for the training environment.

Three factors that can help application developers to select an appropriate training platform are the adoption of the development tools, time to develop the intended application, and training to use the application by the intended users. Experience from the experimental research suggests that the use of non-immersive DVR technology is affordable for schools. The development time of the training objects and environment of the DVR application will be manageable. Training or learning curve to use such an application is not steep as no specialized input and output devices will be used. For spatial training to be highly effective the correspondence of the virtual training objects and environment should be as close as possible to the real life situation – the higher the correspondence the greater the impact of spatial training. Several technological aspects that are important to address this requirement are the levels of immersion, interaction or navigation, and realism. Each of the three factors lies on a continuum of a dimension between low and high extremes. The combination of the three dimensions will engender a sense of presence for learners when they use such a training environment. Higher sense of presence will engage learners to train more effectively. The level of immersion is typically low in DVR and very high in immersive VR that are associated with special data gloves and head-mounted gear. Interaction in a virtual environment ranges from simple navigation using the desktop mouse to highly complex navigation using gestural- and voice-based inputs. The level of realism of the virtual artifacts and environment can be programmed to low level using shaded objects or to high level using rendered objects. Thus, these factors need to be considered when creating such an training environment not only from the technological aspect but also from the financial aspect as well. In summary, we acknowledge that the findings of this study have to be interpreted with caution given its small sample size. Nonetheless, the methodological approach of this research can be used again by using a larger sample size to improve the generalizability of future research. Despite this limitation, which precludes generalization to a larger population, we strongly believe that the findings do shed some light with regard to the use of DVR to improve spatial visualization. In this study, the reseachers have demonstrated that a subset of spatial ability, namely spatial visualization is malleable to training. In addition, the training of this ability is realizable through an affordable, less expensive system, notably the DVR technology, which provides greater opportunity to instructional developers and training personnel to carry out spatial training for their employees, staff or students. More importantly, the findings of this research highlight the major implications of adopting well-establised theoretical principles (i.e., interactive, instructive, and supportive elements) to guide the development of a spatial trainer so that training can be efficacious. Finally, the lessons learned from the study helped the researchers conceive a set of guidelines to guide the development of such a spatial trainer based on the DVR platform.

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EXIT EXAM AS ACADEMIC PERFORMANCE INDICATOR

Mahmoud Al Ahmad, Ali H. Al Marzouqi and Mousa Hussien
College of Engineering
United Arab Emirates University
P.O. Box 15551, Al-Ain, UAE
Tel: (971-3) 713 5150, Fax: (971-3) 713 4970.
Email: m.alahmad@uaeu.ac.ae

ABSTRACT
This paper focuses on the impact of exit exams on different elements of the educational process, namely: curriculum development, students and instructors. A 50-question multiple-choice Exit Exam was prepared by Electrical Engineering (EE) faculty members covering a poll of questions from EE core courses. A copy of the Exit Exam applied during each semester will be available as exhibit material. The exam was administered by the Graduation Project and Industrial Training Unit to graduating students taking Graduation Project II during their last semester before graduation. Results indicate that the student average grade was around 52% and 60% for Fall 2013 and Spring 2013, respectively. The students felt that the exam was difficult and that some problems needed more time. The exam results suggest that we concentrate the exam on general basic questions from the different basic core courses of the program. Thus, it is recommended that focus groups and program assessment committee review the Exit Exam questions and make sure that questions are of the general and principle type and do not require any formula or any memorization. We feel that the response is expected in relation to the exam difficulty. In fact, the EIT exam results in the US range between 50-60%. The Exit exam for Fall 2013 showed weaker results than previous semesters due to the fact that it included more definition-based questions. Also, the average GPA of the graduating students was lower than previous years which could partly justify the weaker performance. Some questions were also seen confusing by students and this suggests that the EE Department needs to draft the questions more carefully. It is worthy to add that in any program development cycle, evaluation is ongoing and one should not wait for the completion of the program or the course to introduce changes.

INTRODUCTION
Exit examinations are common for high school graduates who wish to enter the university. Such exams result in positive effects on student achievement because of incentives for both teachers and students (*Jürges 2012*, *Costrell 1997*, *Effinger 1999, and Jürges2005a*). On the other hand some studies have shown that negative impact of exit exams on students' motivational and emotional experience leading to increased stress, anxiety, or fatigue (*Meyer 2009*, *Pedulla 2003* and *Ryan 2005*). Researchers have related these negative effects to the increased pressure on students exerted by teachers (*Jürges 2005b*). There is still very little known about the impacts of the exams on students' learning (*Merki 2011* and *Zimmermann 2001*). According to theoretical models (*Bishop 1997* and *Wossmann 2003*) the goal for implementing exit exams is to encourage students to put effort into their learning.

Although examinations for professional licensing are common for different disciplines (*Young 2013*, *Macale 2013*, *Seibold 2005*, *Kleiner 2000* and *Pagliero 2011*), exit exams for students who are completing their bachelor degree are not very common. Therefore, this study investigates the impact of the implementation of exit exams on educational and learning process, to assess the importance of exit exams as a quality indicator for academic program reviews and for benchmarking. Though online exist exams are new in engineering, they have been used for many years in medicine.

The exit exam as an assessment tool for engineering programs was introduced and began receiving attention from 1990. Besides basic engineering aptitude, several factors have been recognized to contribute to performance, with "motivation to pass" as one of the most significant factors (*Mazurek 1995*). The subsequent analysis by Watson concluded that the exit examination generated significant amounts of useful assessment data that was not being utilized by engineering programs (*Watson 1998*), and indeed there should be urgent use of such data to be used in academic performance indicator. Several notations and conclusions have been drawn, however, the examinee's motivation to pass contributed to the viability of the results obtained. Several studies recommended that engineering institutions should be providing performance data to institutions' policy makers to allow the use of these results in program assessment. Since that time, many methodologies for applying exit exam results in program assessment have been published (*Watson 1999, Page 1994, Nirmalakhandan 2000,*

Nirmalakhandan 2004, Lawson 2007, Koehn 2008, and Schimmel 2003). Most of these methodologies rely on the use of historic exit exam performance data to assess the overall program, topics within a program, as well as individual course content within a program.

All degree seeking graduates are required to take the exit exam at the United Arab Emirates University (UAEU). The College of Engineering (COE), in accordance with standards established by the Accreditation Board for Engineering and Technology (ABET), has established assurances of learning /educational standards and specific performance indicators that evaluate how well any college of engineering fulfills its educational objectives. In order to implement this initiative, the COE has introduced an exit exam requirement for all its running programs. The purpose of this exam is to ensure that it demonstrates accountability (through the ABET accreditation) and to assist its faculty members to improve programs and courses. Graduates of the Bachelor of Science degree programs are expected to demonstrate certain student learning outcomes and this exam partially assesses these competencies.

At COE, the exit exam is given a credit of 5% of the grade in the final graduation or final year project. In each semester the exit exam is attended by approximately 200 students from the COE's five different departments namely Department of Architectural Engineering; Department of Chemical and Petroleum Engineering; Department of Civil and Environmental Engineering; Department of Electrical Engineering and Department of Mechanical Engineering. These departments follow several procedures to prepare students for the exit exam. Most faculty members contribute to the exam by suggesting helpful questions. Generally speaking, the exit exam is made up of a balance of questions usually collated from the past years courses of study at the specific department. The problems allocated to each department naturally will be relevant to their area of expertise.

The engineering profession is moving dynamically as we start the twenty first century. Technological innovations are changing the way engineers conduct their business as the analysis, trouble shooting, and design tools have evolved allowing for multiple scenarios to be simulated before choosing the most appropriate one, while most industrial operations are automated and monitored throughout allowing for more reliable and safer operations. The role of engineers has also changed as they are often part of technical teams, and in addition to the technical proficiency and professional skills they bring, they are expected to demonstrate managerial and team building skills and have a wider knowledge and appreciation of the societal, economic, and environmental, health, and safety issues related to their industries and profession. These developments have led the College to adopt an engineering curriculum that fosters innovation and better prepare graduates to effectively meet current and future professional needs as well as rapid technological advances encountered worldwide. The UAEU engineering curriculum focuses on a balance of knowledge and skills that prepare graduates to analyze and design engineering systems and become technical leaders in their fields, and provides students multiple opportunities to demonstrate these skills through laboratory hands-on experience, project based learning relevant to their disciplines, design challenges, and professional activities. The engineering applications are founded on a solid core of scientific and engineering knowledge that instills the" engineering sense", and the teaching philosophy emphasizes cooperative and collaborative teaching and learning with emphasis on individual and group activities, effective communication, professional responsibility, self-learning & lifelong learning, and teamwork.

The Departments of Electrical Engineering in the College of Engineering at UAE University has embraced the general philosophy of outcome-based educational methodology, and has engaged in an ongoing assessment process to evaluate the offered programs. Both the programs educational objectives and outcomes are used as a long and short term objectives, respectively, by utilizing a set of tools for indirect and direct measurements of program assessment components. Within the Electrical Engineering (EE) programs, establishing and reviewing educational objectives is part of the assessment and continuous improvement cycle for the programs. This paper describes a process for the establishment and assessment of the educational objectives set by the EE Department at the United Arab Emirates University. This process is initiated by defining the EE programs outcomes to match the ABET (A-K) EC2000 criteria (Fredericks (2004) and from these outcomes the program educational objectives are derived.

PROGRAM ASSESSMENT PROCEDURE
The philosophy of EC2000 is to allow institutions and engineering programs to uniquely define their mission and objectives to meet the needs of their constituents. In addition, the new ABET system focuses on continuous improvement of program based on the results of the assessment process for program objectives and outcomes and on the input of constituents (Whiteman, 2003). The EE programs at the United Arab Emirates University were established in 1980. The mission of these programs is to meet the educational, research, and service needs of UAE society by providing programs and services of the highest quality. Also it contributes to the expansion of

knowledge by conducting quality research and by developing and applying modern engineering tools and techniques that could play a significant role in the technical and economic development of the country. The EE programs' educational objectives were designed to meet the UAEU mission and to fulfill the ABET requirements. These objectives were intended to serve new graduates by providing them with:

- o Adequate skills including, understanding of scientific and engineering concepts, effective oral and written communication, ability to participate in life-long learning, diverse and global professional careers, project management and decision making.
- o Strong foundation in engineering principles and practices, based on the learning of fundamentals of engineering, ability to use advanced techniques, and participation in relevant engineering interactions.
- o Enhanced problem-solving skills that involve designing and conducting experiments, analyzing and interpreting laboratory as well as field data, innovation and conceptual thinking, and applying engineering through research and/or industrially oriented projects.
- o Ability to understand important issues, such as knowledge and appreciation of the codes of ethics, awareness and appreciation for health, safety and environmental issues, integrating ethical, social, health, safety, and environmental issues into practical projects, economic evaluation and risk assessment, awareness of international standards and specifications.
- o Working skills in multi-disciplinary teams; functioning with peers from other disciplines, integrating information and data from multiple sources, participating in technical seminars and industrial/professional functions and events, and adaptability to different working environments.

The program outcomes that have been established as goals of the EE program follow closely the ABET required outcomes. Achievement of these outcomes in the context of EE program would meet the requirements and outcomes. The Exit Exam is administered to measure student competence in areas identified as critical to the EE Program, thus it is considered as one of the assessment tools used by the EE department to verify students' achievements. The exam consists of 50 multiple choice questions with five questions for each representative course. It is anticipated to use a nationally normed assessment tool currently under development by Electrical Engineering Department and supported by The Institute of Electrical and Electronics Engineers (IEEE), when it becomes available. The ABET program outcomes are defined as:

- a. an ability to apply knowledge of mathematics, science and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data
- c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. an ability to function on multidisciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively (3g1 orally, 3g2 written)
- h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i. a recognition of the need for, and an ability to engage in life-long learning
- j. a knowledge of contemporary issues
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Moreover; the worldwide trend is now on computer-based and online exams. This is because:

1. Multiple versions of the exam can be distribute without having to manually monitor which students got which tests.
2. Quickly evaluation of the performance of the group is possible.
3. Less time and effort is needed.
4. Question styles on exams, including graphics can be mixed and made more interactive than paper-based exams.
5. Human errors in grading can be eliminated.
6. Save paper.

The use of computer based exam or online exams goes under this trend of the e-learning and e-education systems.

THE STUDY

The primary purpose of the exit exams is to assess students' educational achievement in the courses in their major area of program study. The exam is supposed to measures the learning outputs of the program as a whole not the individual courses. Naturally the students have already shown a certain level of proficiency through earning passing grades in these courses. Organizations that accredit college and universities such as ABET, often

require an additional demonstration of achievement through passing scores on objective examinations. Such objective examinations should assess the knowledge that one must have from the study of these subjects regardless of who teaches the course and where the course is taught.

An exit examination tests students at the end of their program of study for attainment of the program's intended learning outcomes. They cover one or more program-level outcomes, not course-level outcomes. Because the test is used to determine whether COE has met the ABET accountability standards, students still would be required to take the exam. A set of questions is normally identified covering the fundamentals and highlighting key concepts in engineering in the past year course. These questions stress the basic and fundamental knowledge that any engineer should possess before starting practicing. By default, fewer advanced questions are introduced to distinguish between the smart and the average students. The number of questions varies from department to department, but is normally kept identical among all years. Moreover, some exams are the same as in the past taking into consideration that even no single question will be known or revealed for the next student batch (The exams are similar to past year exams). In the last 3 years, the exams were held online. There was no significant difference in the grades whether it is computer based or paper based. The exam is conducted on the same day and same question*s* are given to everyone on campus in the presence of proctors.

The score on this exam should reflect the student performance. This exam tests the student on knowledge, skills and attitudes gained throughout the study of the courses of a specific program. It is expected that students do not study for the exam, but they put a good faith effort into doing their best.

The graduate exit exam is a requirement for degree completion. The exit exam is a mandatory exam, which is administered on campus. It is offered twice a year: fall and spring terms and is normally scheduled at least three weeks before the graduation deadline. The online exam has been conducted with the following conditions:

1) The exam can only be taken once.
2) All exiting students take the exam simultaneously.
3) The total number of questions is ranging from 50 to 100, depending on the program.
4) Once started, this test must be completed in one sitting.
5) Time is set for 2 hours.
6) There is a required password to access this test.
7) One question is normally presented at a time.
8) Changing the answer to a question that has already been submitted is not allowed.
9) Questions are randomized.
10) No smart phones or electronic devices are allowed in the examination hall.

FINDINGS

Figure 1 shows exit exam results at one of the engineering departments at *UAEU* for the year 2012. The total number of admitted students was 36 over the two semesters. The represented data reveals that 22% of the students scored "A", 0% "B+", 11% "B", 20% "C+", 14% "C", 17% "D+" , 8% "D" and 8% "F". Therefore, 92% of the students passed the exam from the first attempt.

Immediately after the exit exam, student's feedback about the exam and their reflections were collected. Many students do not see any benefit for the exam since it only weighs 5% of their final grade in the final graduation project course. Some students believe that this exam has to be taken first by the instructors themselves to see how many of them can pass. Others believe that this exam is a good chance to remind them of what they have studied in the last four years of their study (many students spend 5 years).

The exam is computer based and has been designed and integrated in the blackboard-UAEU online education system for students. The build- in grade system offers the opportunity to display each question with its multiple choice options along with the percentage weight of each multiple choice option. This helps in detecting how many students have chosen the right answer and how many have chosen each of the other choices, as depicted in Figure 2.
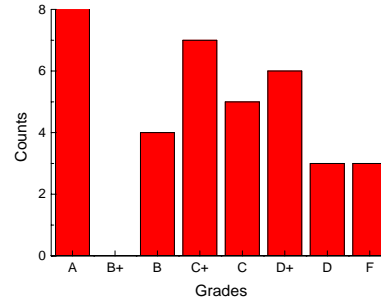
Figure 1: Exam grade distribution at one of the engineering departments at UAEU for the year 2012. A: above 90, B+ from 85 to 89, B from 80 to 84, C+ from 75 to 79, C from 70 to 74, D+ from 65 to 69, D from 60 to 64 and F below 60.

Figure 2: A statistical portion from the blackboard shows the percentage weight of the answers. 50% of the students choose the wrong answer while the other 50% have chosen the right answer.

Table 1 summarizes the average grade obtained in both semesters along with student data. It is clear that the overall spring semester results show some improvement over that of the fall semester, and it shows a noticeable improvement when considering a 50% as a passing grade.

Table 1- Summary of Exit Exam results for Fall and Spring Semester of AY 2012-2013

Semester	AY	# Students	% Students Grades >= 60 %	% Students Grades >= 50 %	Total Average Grade	Average Std. Dev.	Average Student GPA
Fall	2012-13	29	27.6 %	69.0 %	51.9 %	5.88	3.06
Spring	2012-13	19	42.1 %	89.5 %	59.6 %	5.61	2.93
Fall	2013-14	24	2.9 %	20.6 %	39.6 %	4.68	2.75
Spring	2013-14	21	57.1 %	76.2 %	59 %	6.31	-

Tables 2 (a-c) shows the overall average grade mapped to each program outcome for the Fall and Spring semesters of AY 2012-2013 and AY 2013-2014. The same exit exam was applied for fall 2012 and spring 2013. Different exit exams were applied during fall 2013 and spring 2014 semesters. **Table 3** shows the conversion criteria used from percentage grade (%) to a performance value on a scale 1-5. It should be mentioned that students were not given any prior exam samples to practice on or any material related to the exam. Our expectation is that an average grade for a particular program outcome above 50 % is considered satisfactory and any average below this requires further analysis of the exam topics where students scored the lowest grades.

Table 2(a)- Average Exam Grade for Each Program Outcome for both Fall and Spring semesters of AY 2012-2013

Program Outcomes	Mapped Exam Questions	Total Number of Mapped Questions	Fall 2012		Spring 2013	
			Average Grade (%)	Equivalent Performance Level (1-5)	Average Grade (%)	Equivalent Performance Level (1-5)
A	1-43, 45-50	49	51	3	59	3

B	-	-	-	-	-	-
C	5,9,11,12,16-27, 42, 44	18	56	2.5	65	3.5
D	-	-	-	-	-	-
E	13-15, 37, 39- 42, 48	9	43	2.5	60	3.5
F	-	-	-	-	-	-
G	-	-	-	-	-	-
H	-	-	-	-	-	-
I	13-15	3	70	4	74	4
J	8, 10-12	4	42	2.5	57	3
K	-	-	-	-	-	-

Results indicate that the student average grade was around 52% and 60% for Fall 2012 and Spring 2013, respectively. The students felt that the exam was difficult and that some problems needed more time. The results suggest that the program concentrates the exam on general basic questions from the different basic core courses of the program. Thus, it is recommended that focus groups and program assessment committee review the Exit Exam questions and make sure that questions should be of the general and principle type and do not require any formula or any memorization. We feel that the response is expected in relation to the exam difficulty. In fact, the EIT exam results in the US range between 50-60 %.

The Exit exam for Fall 2013 showed weaker results than previous semesters due to the fact that it included more definition-based questions. Also, the average GPA of the graduating students was lower than previous years which could partly justify the weaker performance. Some questions were also seen confusing by students and this suggests that the EE Department needs to draft the questions more carefully.

Results for Spring 2014 were improved and comparable to those of AY 2012-2013, indicating an average group performance of 59 % which is comparable to typical EIT exam results in the US universities. The suggestion is to make questions more conceptual and dependent on basic skills required from graduates. Otherwise, formulas must be made available to students. It is also believed that the Exit Exam must assess basic engineering application skills including the knowledge of basic math and science, technical skills, engineering standards, and communication skills.

Table 2(b)- Average Exam Grade for Each Program Outcome for Fall semester of AY 2013-2014

Program Outcomes	Mapped Exam Questions	Total Number of Mapped Questions	Fall 2013	
			Average Grade (%)	Equivalent Performance Level (1-5)
A	1-2, 5-6, 8, 10-121, 23-24, 26-43, 48, 50	39	42	2.5
B	3, 7, 10-11, 14-16	7	28	1
C	3, 6-7, 9, 13-18, 33-38, 40-44, 46-47, 49	24	44	2.5
D	-	-	-	-
E	2, 4, 14-16, 23-24, 27, 33-38, 40-47, 49	23	37	1
F	27, 37	2	16	1
G	-	-	-	-
H	-	-	-	-
I	1, 8, 28-30, 37, 40, 42, 48, 50	10	39	1
J	-	-	-	-
K	4, 6, 20-25, 45-47	11	36	1

Table 2(c)- Average Exam Grade for Each Program Outcome for Spring semester of AY 2013-2014

Program Outcomes	Mapped Exam Questions	Total Number of Mapped Questions	Spring 2014	
			Average Grade (%)	Equivalent Performance Level (1-5)
A	1-27, 30-44, 47-50	46	59	3
B	27-28	2	50	3
C	1, 15, 22-25, 39-40, 45	9	74	4
D	-	-	-	-
E	29, 32-34, 38-40, 43-48	13	45	2.5
F	-	-	-	-
G	-	-	-	-
H	-	-	-	-
I	-	-	-	-
J	-	-	-	-
K	-	-	-	-

Table 3- Mapping of Average Exit Exam grade to an equivalent performance level

Average Value	Equivalent Performance Level (1-5)	Action to be taken
90 % ≤ g	5	No action
70 % ≤ g < 90 %	4	No action
60% ≤ g < 70 %	3.5	No action. However, improvements may be suggested
50% ≤ g < 60 %	3	No action. However, improvements may be suggested to some topics
40% ≤ g < 50 %	2.5	Improvement needed. The Exit Exam requires major revision and action to improve student abilities
g < 40 %	1	Failure—Need to look for weaknesses and seek ways to strengthen student skills in particular topics

Such analysis on exit exam results draws our attention to some questions which can be classified as fundamental and should not be missed or wrongly answered. The question that is presented in Figure 2 is considered as fundamental and can easily be mapped to the specific course where this topic is supposedly covered.

It is worthy to add that in any program development cycle, evaluation is an ongoing process and one should not wait for the completion of the program or the course to introduce changes. Other elements such as the teaching skills of faculty members may be related to the success of students in the test. Personal worries and anxieties that students have at the end of the course may also be factors that should be taken into account given their psychological impacts.

In general, the curriculum development process includes several stages that are ordered as follows: the design, development, implementation and evaluation of curricula, as depicted in Figure 3. The exit exam could be used as a monitoring tool whose outcomes could be used for feedback, evaluation and reviewing processes, as depicted in Figure 4. Moreover, the monitoring can be seen as part of the implementation process of the curriculum. It is at this stage that departments have responsibility to verify that student performance is consistent with the established goals and objectives of the university curriculum. As stated previously, the data and information are gathered to inform university policy and decision makers about the curriculum. At the evaluation stage, academic representatives are engaged in analyzing the collected data to measure the effectiveness of the curriculum design and its implementation.
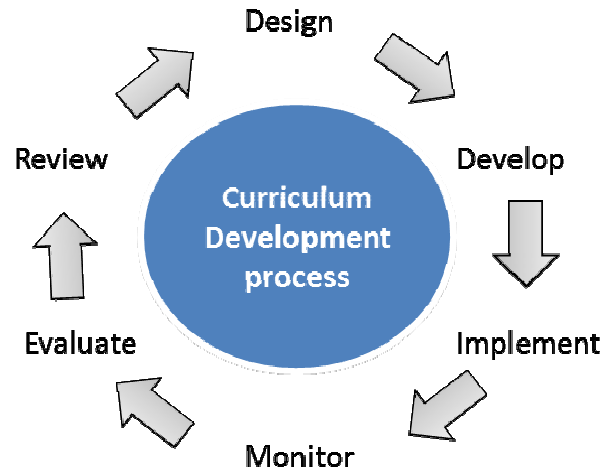
Figure 3: Conventional curriculum development process.

The exam serves to provide the departments, colleges and universities with detailed up-to-date feedback, which helps develop the program and its courses. Once the students take the exam, the results are analyzed, examined and discussed extensively to identify points of strengths as well as weaknesses and pinpoint any areas for development in the academic programs or even the introduction of new programs and courses. Thus as a consequence, those detailed results will allow colleges and departments to identify domains where the students excel and those which need improvement and better assessment.

The expansion of exit exams can be attributed mostly to standard based reform, and college administrators are the main drivers. Standards have provided solid reliable foundations and backgrounds to the concept of exit exams by setting what students should know and be able to do by the time they graduate from engineering schools. College administrators have an ongoing responsibility to closely monitor the implementation of exit exams. They must understand the effects of these tests, including any negative or unexpected consequences, so they can address problems or adjust state policies.

Results of the exit exams could be used by universities in the evaluation of their instructors and faculty member during one batch. This evaluation may impact the academic promotion of faculty members. This action would force instructors to do their best to explain the content of the course well, which will impact significantly on the students' performance and proficiency. Questions of the exit exam are mapped with their corresponding courses, within which the information has been covered. Needless to say that a good instructor is the one who helps students to retain the necessary and basic knowledge as long as possible.
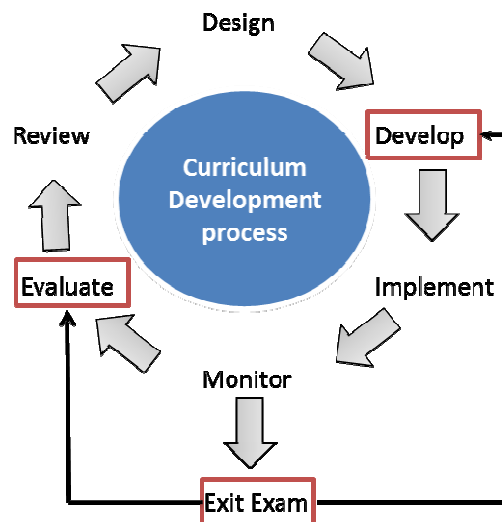
Figure 4: Curriculum development process and exit exam feedback.

The exit exam aims at measuring the students' attainment of the program learning outcomes as well as their performance in the individual courses/domains relevant to their specialization. This is highly important in higher education as it serves as a point of reference for program enhancement. The students taking the exam realize the importance of the exam when it is seriously taken. These types of exams will motivate students to work harder and help teachers identify and address students' weaknesses.

The ABET accreditation now requires students at engineering school to pass an exit exam before graduating; a key element of standards-based accountability reforms. The objectives of this test are as follows:

1) To make sure that all courses are expeditiously completed and that they are taken before other courses that may have them as prerequisites. If the time limit is not met, the student may be dis-enrolled.
2) To use the exit exam results to introduce necessary adjustments to teaching and learning processes.
3) To assess functions to improve student learning, to discover course-embedded assessment models and contemporary approaches to curriculum design, teaching methods, and assessment
4) To benchmark measure of excellence this will help to improve the department services and operations by tracking several measureable parameters over the years.
5) *To measure* the quality of the engineering programs.
6) *To provide data and information for decision* making process.
7) To learn how assessment strategies can form the groundwork for an improved "assessment"
8) To map and to provide "backwards" feedback for curriculum design and development

To improve the exit exam results, the following are suggested:

1) The contribution percentage of the exit exam should be increased from 5 to 10%.
2) Students must repeat the exit exam until they pass.
3) A minimum score level for passing the exit exam should be defined.
4) After the exam, a statistical analysis of the results should be used to compare the new test to the benchmark set.
5) It is necessary to rewrite the exam periodically to maintain security.
6) The exam score of the students should appear on their transcripts.

CONCLUSIONS
Exit exams can be vital to the improvement of academic programs quality and effectiveness. These benefits can help improve the quality of programs across colleges at the UAEU as well as other institutions within the UAE. Moreover, this creates a good area for cooperation between academic departments since they can compare results and work jointly to improve the quality of higher education as a whole. Coaching or preparing students for the test is a problem and should be avoided. At the end, ABET and degree-accreditation agencies have strong reasons to keep track of the impacts of exit exams. It is worthy to add that in any program development cycle, evaluation is ongoing and one should not wait for the completion of the program or the course to introduce changes. Other elements such as the teaching skills of faculty members may need to be considered as part of the success of the test. The personal worries and anxieties that students may have at the end of the course are also factors that should be taken into account.

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EXPLORING STUDENTS INTENTIONS TO STUDY COMPUTER SCIENCE AND IDENTIFYING THE DIFFERENCES AMONG ICT AND PROGRAMMING BASED COURSES

Michail N. Giannakos
Department of Computer and Information Science, Norwegian University of Science and Technology (NTNU)
Sem Sælands vei 7-9, NO-7491 Trondheim, Norway
mgiannakos@acm.org

ABSTRACT
Computer Science (CS) courses comprise both Programming and Information and Communication Technology (ICT) issues; however these two areas have substantial differences, inter alia the attitudes and beliefs of the students regarding the intended learning content. In this research, factors from the Social Cognitive Theory and Unified Theory of Acceptance and Use of Technology were selected as important motivating factors in students' behavior and attitude towards CS courses. This hybrid framework aims to a) investigate the influence of these factors on students' intention to study CS and b) identify potential differences on these effects among ICT and Programming based courses. Responses from the total of 126 Greek students, (71 attending ICT courses and 55 attending Programming Courses) were used to measure the variables and to identify the differences between ICT and Programming students. Results revealed the influence of most of the motivating factors, on students' intention to study CS and indicated the moderating effect in the enrolment with ICT or Programming course on the relationship among students' Perceived Behavioral Control and their intention to study CS. The outcomes of this study are expected to open new avenues to understanding students' intentions to pursue computing and IT related careers.

Keywords: Secondary education, Computing education, Student experiments, ICT, Programming.

INTRODUCTION
The comparison of Computer Science Education (CSE) in different countries uncovers substantial disparities regarding the conception as well as the practice (Hubwieser et al., 2011). Some of these disparities are forced by the big differences in the Educational Systems, while others are caused by differences of traditions, national heritage or public opinion. In several countries computer science education (CSE) has been introduced in the curricula as a distinct course, while it was taught across curriculum in others. Generally CSE focuses on basic concepts about the constructional principles of computers and networks (hardware) and the principles of programming, (formal languages and programming), whereas Information and Communication Technology (ICT) is focused on computer uses and how to apply software (The Royal Society, 2012). In many countries (Hubwieser et al., 2011), CSE includes both ICT and programming courses, however, students' sometimes face these courses differently.

Many theories have been employed to understand students' perceptions and attitude towards learning media (Giannakos et al., 2013) and curricula (Chen et al., 2011). The Unified Theory of Acceptance and Use of Technology (UTAUT) and his initial forms are the most widely and successfully used models (Chen et al., 2011). Other researchers have empirically explained (using UTAUT or its initial form of TAM) several issues regarding students' attitude (Hsu and Lin, 2008; Shih, 2008). As successful CS teaching largely depends on students' perception and beliefs, we aim to identify students' differences among programming and ICT courses. In this light, variables related to students' attitude were chosen and applied to programming and ICT courses respectively. Then a between group experiment was conducted among students participating ICT course and students participating programming course. Our empirical research aims to investigate any distinct differences among ICT and programming courses in order to shed a light in the differentiation of educators' attitude in these courses which are mostly (in many countries) treated as a common course.

The focus of this empirical study is to measure students' beliefs and to identify potential differences among ICT and Programming courses. As (1) students' beliefs and attitude are highly correlated with their performance and (2) students' perceptions have an impact on what they have already learned and what they choose to do next (Metcalfe and Finn, 2008). This article describes an attempt to investigate students' motivational factors into a secondary education ICT and Programming courses by quantitatively measuring students' perceptions. Since several differences have been identified among ICT and Programming based courses (Giannakos et al., 2013),

with that paper we are going one step ahead by investigating which factors influence students to participate in CS courses and how the nature of these courses (ICT or Programming based) moderates this influence.

In particular, this attempt is undertaken by using a quantitative survey of student perceptions in an ICT and Programming courses on the Greek educational context. The purpose of the survey was to assess students' perceptions toward a wide variety of behavioral issues in CS, including a number of issues that are related to their beliefs and their intentions. The study itself had the three following goals.

- Measure and understand students' perceptions regarding: usefulness, social impact, satisfaction, self-efficacy and control on the CS courses.
- Investigation of the potential effect of the prior perceptions on students' intention to study CS courses.
- Investigation of the potential differences among programming and ICT courses in the effect of the students perceptions on their intention to study the respective course.

The clarification of these three goals is expected to contribute to the understanding of students' performance and intentions to pursue programming and ICT courses in their future studies.

The paper is organized into six sections. In the next section, the related work and the hypotheses are outlined. In the third section the ICT and Programming courses are presented as they are taught in Greek educational system. The fourth section describes the methodology employed to investigate the effect of some important students' perceptions in their intention to study CS courses and if there is any differentiation on that effect among ICT and Programming courses. The fifth section outlines the empirical results and at the final section, the article concludes with implications, limitations and future work.

RELATED WORK AND RESEARCH HYPOTHESES

Students' perceptions and intentions are important determinants of the learning success (Metcalfe and Finn, 2008). Disinclination towards studying CS disciplines implies that more research is needed to investigate how students could be motivated. Previous studies (Barker et al., 2009; Biggers et al., 2008; Papastergiou, 2008; Akbulut, 2010) have empirically investigated numerous issues related to perceptions and beliefs regards CSE, it is mostly focused on higher education and more specifically on CS departments. As a result, to date, there is lack of empirical studies on students CSE perceptions and the effect of these perceptions into students' intentions to study CS courses.

To date, many theories have been applied to address students' attitude, perceptions and to identify the influence of different factors on the adoption of science education. UTAUT and Social Cognitive Theory (SCT) are some of the most successfully used theories in students' behavior [e.g., (Hsu and Lin, 2008; Lee et al., 2009)]. In addition, Performance Expectancy (PE), Perceive Behavioral Control (PBC), Satisfaction (STF), Social Influence (SI) and Self-Efficacy (SEF) have been verified as important determinants on affecting students' intention to attend a respective course [e.g., [Chen et al., 2011)]. In view of the above we aim to measure these factors and examine the effect of them on students' Intention to Study with CS courses (ISCS); in addition we will identify potential difference of these effects among ICT and Programming courses.

The Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is the successor of Technology Acceptance Model (TAM) and combines a great number of TAM variables (Venkatesh et al., 2003). Perceived Expectancy is based on the traditional construct of "perceived usefulness" from the original (TAM) study. Prior research on systems' adoption has agreed that UTAUT is valid in predicting the individuals' enrolment on various contexts (Hsu and Lin, 2008). In our case high performance expectancy (PE) means that students believe attending CS course is useful for him/her and we assume that positive PE lead them to attend the course. Thus, we hypothesize that:

H1. Students' PE has a significant positive effect on their ISCS.

Student satisfaction (STF) is a measure of subjective evaluation of any outcome or experience associated with the attendance of CS courses. Studies have suggested that individual perceptions of satisfaction influence in a positive way their intentions (Lee and Lin, 2005). In addition, in CSE, satisfaction has been recognized as an important factor for student attitude (Drury, Kay and Losberg, 2003). In that study, we assume an important role of satisfaction, that effect students' Intention to Study CS. Specifically, we argue that, if previous experience is positively evaluated, and hence incurs students' satisfaction, then it has a higher impact on their willingness to study the respective course. Hence, we hypothesize that:

H2. Students' STF has a significant positive effect on their ISCS.

UTAUT (Lee et al., 2009) introduces Social Influence (SI) and explained usage intentions in terms of social influence. SI refers to the degree to which an individual's opinion affected by others (i.e.., friends, relatives). As the learning/teaching process is negotiated through numerous interactions (e.g., instructor-learner, learner-learner), and its characteristics, in turn, have the socializing factor very intense (Rorty, 1999).In addition, prior studies have showed that Social Influence is a significant predictor of individual's decision (Giannakos and Vlamos, 2013). In view of the above, we assume that SI influence students' Intention to Study CS. Thus, the following hypothesis was proposed.

H3. Students' SI has a significant positive effect on their ISCS.

Social Cognitive Theory (SCT)

SCT (Bandura, 1986) indicates that cognition employs strong influence on the creation of one's beliefs and reality, as it selectively structure and convert information on actions (Jones, 1989). In his attempt to explain how people acquire and maintain certain behavioral patterns, Bandura (1986) defines Self-Efficacy (SEF) as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance (p. 391)". SEF is important in learning processes because "competent functioning requires both skills and self-beliefs of efficacy to use them effectively" (Bandura, 1986; p. 391). In prior studies (Chang and Tung, 2008), a significant influence of SEF on learners' intention has revealed. SEF is specific to a certain activity and context. Hence, an individual may have high SEF in one course (Algebra), and low SEF in another (CS). However, it is likely that SEF will positively affect students' ISCS. Hence, we assume that:

H4.Students' SEF has a significant positive effect on their ISCS.

Theory of Planned Behavior (TPB)

Another widely used theory is the TPB (Ajzen, 1985); TPB is based on individual's perception of the ease with which the behavior can be performed, or in other words Perceived Behavioral Control (PBC). In particular, PBC refers to a individual's potential to perform the behavior in question, how easy/hard the behavior is perceived to be (Ajzen, 1985). PBC has been widely used to investigate several issues concerning students' use of technological tools (Shih, 2008). In addition, prior research (White et al., 2008) has indicated that attitude and PBC predicted intentions, with intention as the sole predictor of attendance at peer-assisted study sessions. This means that students were more likely to participate on peer-assisted study sessions if they had positive attitudes and believed that they had control over attending them. Hence, in the context of CS it should be investigated if students' PBC affects their ISCS. Therefore, we hypothesize that:

H5.Students' PBC has a significant positive effect on their ISCS.

Differences among ICT and Programming Courses

Students' perceptions regarding CS many times lead their actual behavior (Ruslanov and Yolevich, 2010). In most of the prior research CS has been mostly investigated as a unified (both ICT and Programming) course. However, there are certain differences among these two disciplines and the investigation of these differences is highly important as many countries used a unified curriculum for ICT and Programming (Hubwieser et al., 2011; Ismail et al., 2010). Hence, in the context of CSE, it seems likely that ICT and Programming courses may have important differences in students' perceptions and their attitude. Therefore, the moderating effect of the courses ICT and Programming on the relationships among the motivating factors and ISCS is emerged to be examined. This leads us to the following five hypotheses (see in Figure 1 the visual diagram of the hypotheses):

H6a. ICT or Programming orientation moderates the influence of PE on ISCS.
H6b. ICT or Programming orientation moderates the influence of STF on ISCS.
H6c. ICT or Programming orientation moderates the influence of SI on ISCS.
H6d. ICT or Programming orientation moderates the influence of SEF on ISCS.
H6e. ICT or Programming orientation moderates the influence of PBC on ISCS.
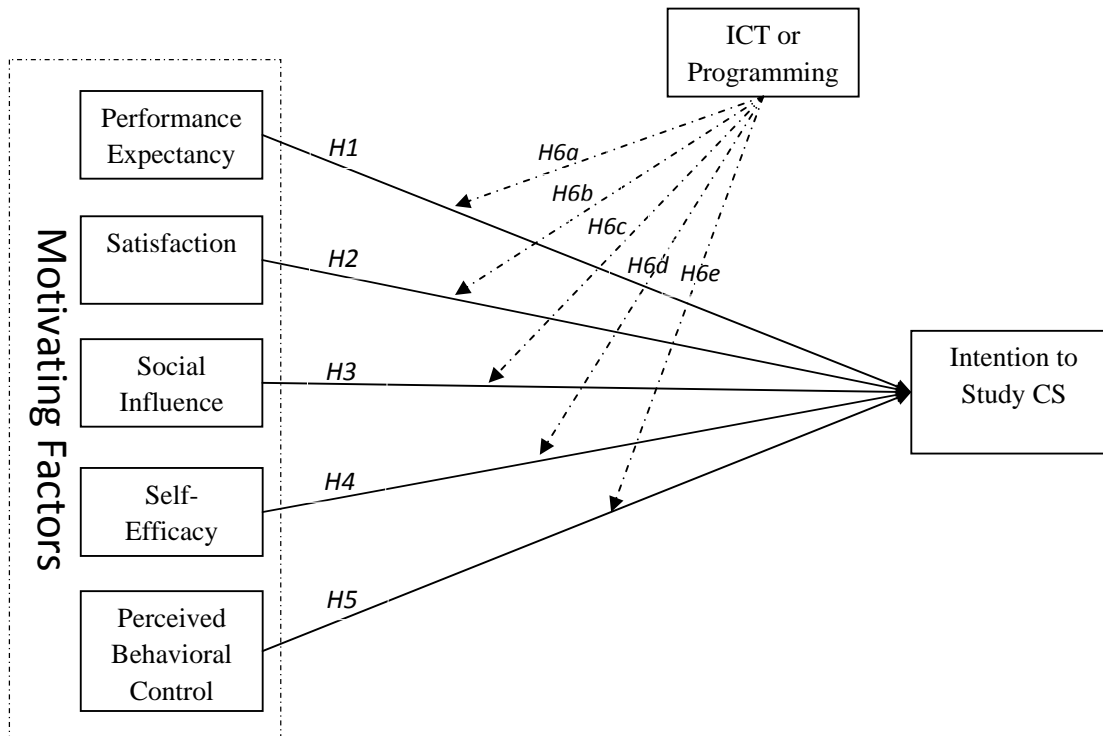
Figure 1: The Visual Diagram of the Hypotheses

ICT AND PROGRAMMING COURSES IN GREECE
The curricula of Secondary Education in Greece, since the school year 1998-1999, included a single philosophy which was based on the Single Curriculum Framework. In 2003, the Interdisciplinary Unified Education Course Framework (IUECF) and the new detailed curricula (NDC), prepared for compulsory education, from which the inter-disciplinary approach of knowledge was adopted. Afterward in the school year 2006-2007 the new books have been introduced to the schools (based on IUECF and NDC).

In these compulsory education Curricula the importance of Information and Communication Technologies and the role these should play is widely recognized. ICT is not seen only as a separate subject of study, absolutely necessary today for students' technological literacy, but also as a multi-tool: cognitive teaching, information seeking, communicating knowledge etc. The theoretical model adopted, for introducing ICT in lower secondary education, is characterized by the teaching of an "informatics" course and the gradual use of computational and networking technologies as a means to support the cognitive process for all subjects of the programme of study.

The Cross-curricular Single Framework for Curricula for the lower secondary education, through the teaching of Informatics, foresees that the student is to (I-Curriculum, 2003):

- Be able to explain and analyze basic notions and terminology of Informatics (i.e. data, information, coding, data handling, file, save, programme, software, etc).
- Be aware of the operations of the main computer units and use with ease a computer system.
- Use generic software tools to record (write down) their ideas, to treat and present them in a variety of ways and means, to resolve simple problems, to use simple projection and control models in order to simulate and test simple problems or results from other cognitive domains.
- Be able to select, choose, analyze and evaluate information through different sources (electronic encyclopedias, electronic dictionaries, www etc) and utilize these for complex projects individual work or teamwork.
- Utilize possibilities offered by ICT to communicate, exchange views, wonder, entertain, present their ideas and opinions (the way they choose) and apply simple knowledge of ICT in everyday life.
- Develop critical skills to be able to address problems using computer and to resolve simple problems in a programming environment.
- Cooperate to perform a given project, develop initiatives, design, set objectives, recognize the importance

of teamwork in advancing the project, discuss and assess their work and the work of the others.
- Develop an ethics code in regards to their work in the lab, the respect of the work and differentiation of others.

In addition, Informatics has been introduced as a separate curriculum subject which is taught once a week by specialist IT teachers. In the course of Informatics ICT content dominates the curriculum throughout lower secondary education. By the end of the third Gymnasium (middle school) year the students are introduced into fundamental algorithms and programming using Logo.

In the case of upper secondary education (Lyceum, equal to high school); the 1st grade operates as an orientation year with a general knowledge program. The second grade offers three directions (Scientific, Theoretical and Technological). In the third grade of Lyceum students are following again the same three directions. Students who follow the technological direction are taking a programming course. This course focuses on the development of problem-solving and algorithmic skills through programming.

The overall aim of the programming course is to help students to develop algorithmic thinking and methodological and problem solving skills within a programming environment. This Programming course includes basic algorithmic and programming concepts (conditions, logical expressions). This course is being taught (partially) in school labs. The Ministry of Education has certified specific programming environment to support the lab work, especially for the Lyceum programming course. In addition to the certified programming environment, there are other educational software that have been developed by scholars and educators, and are already in use in many schools, in order to motivate students, and increase the retention (Papastergiou, 2009).

METHODOLOGY
Context
The empirical study was conducted in the context of secondary education in Greece. As we previously mentioned, the relevant curriculum ICT courses (named Informatics) are mandatory during Gymnasium (lower secondary) years and aim to teach students' ICT (e.g., word processing). The first group in our experiment (ICT Group) consisted of students attending the 3rd class of Gymnasium. They have experience on ICT courses and they are asked for their perceptions regarding the ICT curriculum in the under investigation factors.

For the case of Lyceum (high school), ICT is taught as an elective or direction course since 1999. Thus, besides mandatory education (primary, lower secondary), students in all the classes of Lyceum can select certain ICT from a wide range of various subjects. In the last two classes of Lyceum, students select one of three directions, technological, scientific or theoretical). If students in the last grade select the technological direction, they attend the programming course for which they are assessed through national exams. The second group in our experiment (Programming Group) consisted of students attending the 3rd class of Lyceum. They have experience on the programming course and they are asked for their perceptions regarding the programming curriculum in the under investigation factors.

In view of the above, our between group experiment was conducted among students' of 3rd of Gymnasium regarding ICT courses and students of 3rd of Lyceum regarding programming courses.

Sampling
The data collection included a questionnaire composed by questions on the six principal factors. The questionnaire was open during the last ten days of November 2011 at four public Gymnasiums (middle schools) and four public Lyceums (high schools) in the northwestern Greece. The final sample included 126 participants (students). From the total of participants, 71 (56.35%) were 14 years and attended 3rd of Gymnasium (taught ICT course) and 55 (43.65%) were 17 years and attended the 3rd of Lyceum, in addition, 89 were males (70.6%) and 37 (29.4%) females.

Measures
The questionnaire included measures of the principal factors identified in the literature. Appendix lists the survey factors with their items, their operational definition, and the source from the literature review. In all cases, 7-point Likert scales was used (from 1 strongly disagree to 7 strongly agree).

DATA ANALYSIS AND RESEARCH FINDINGS
We followed the three step procedure to assess the convergent validity of any measure in a study (Fornell and Larcker, 1981):

(1)   Composite reliability of each construct,
(2)   Item reliability of the measure,
(3)   The Average Variance Extracted (AVE).

First, we carried out an analysis of composite reliability and dimensionality to check the validity of the scale used in the questionnaire. Regarding the reliability of the scales, Cronbach`s indicator was applied and inter-item correlations statistics for the items of the variable. As Table 1 demonstrates, the result of the test revealed acceptable levels of internal consistency in all the factors.

In the next stage, we proceeded to evaluate the reliability of the measure. The reliability was assessed by calculating the factor loading onto the underlying factor. A factor loading of 0.5 and higher is recommended to be good indicator of validity at the item level (Segars, 1997). Based on the factor analysis we identified 6 distinct factors; a) Performance Expectancy (PE), b) Satisfaction (STF), c) Social Influence (SI), d) Self-Efficacy (SEF), e) Perceived Behavioral Control (PBC) and f) Intention to Study CS (ISCS) (Table 1).

The third step for assessing the convergent validity is the AVE; AVE measures the total variance that is applied to the factor in relation to the amount of variance derivable to measurement error. Convergent validity is found to exceed the recommended thresholds of 0.50 (Segars, 1997).

Table 1: The measurement values

Factors	Items	Mean	S.D.	CR	Loadings	AVE
Performance Expectancy	PE1	4.61	1.81	0.89	0.75	0.65
	PE2	4.48	1.74		0.80	
	PE3	4.76	1.63		0.85	
	PE4	4.83	1.51		0.81	
Satisfaction	STF1	5.21	1.40	0.88	0.63	0.56
	STF2	5.20	1.39		0.66	
	STF3	5.63	1.35		0.85	
	STF4	5.41	1.36		0.83	
Social Influence	SN1	4.32	1.93	0.86	0.79	0.65
	SN2	4.09	1.92		0.82	
Self-Efficacy	SEF1	3.56	1.90	0.71	0.86	0.71
	SEF2	4.04	1.77		0.82	
Perceived Behavioral Control	PBC1	5.01	1.44	0.86	0.85	0.69
	PBC2	4.78	1.49		0.81	
Intention to Study CS	ISCS1	4.63	1.91	0.93	0.83	0.78
	ISCS2	4.56	1.93		0.90	
	ISCS3	4.00	1.91		0.91	

Respondents expressed high STF (5.36/7) with CS courses. In addition, PE (4.67/7), PBC (4.40/7), ISCS (4.40/7) and SI (4.21/7) were slightly lower. These high levels indicate positive insights of students concerning their experience, control, usability, usefulness and intentions to study CS. However, their SEF (3.80/7) with computing is not indicating the same positive view.

Pearson's correlation coefficient between the factors was used, which is about quantifying the strength of the relationship between the variables. By performing Pearson's test we found that some of the factors are correlated relatively strong. In particular, ISCS is related with all factors, except for SEF; in addition SEF has no correlation with SI and STF. Table 2 exhibits the correlations between the factors in detailed.

Table 2: The measurement values

Factors	PE	STF	SI	SEF	PBC	ISCS
PE	1					
STF	**0.55****	1				
SI	**0.52****	**0.59****	1			
SEF	**0.18***	0.05	0.09	1		
PBC	**0.42****	**0.52****	**0.51****	**0.22***	1	
ISCS	**0.42****	**0.49****	**0.42****	0.10	**0.45****	1

Correlation is significant at the* 0.05 level, ** at the 0.01 level.

To examine the research questions regarding the effect of the selected factors on students' ISCS we used Analysis of Variances (ANOVA) including students' ISCS as dependent variables and the five factors (PE, STF, SI, SEF, PBC) as independent variable. As we can see from the outcome data in Table 3, all the selected variables except SEF have indicated an impact on students' ISCS.

Table 3: Hypothesis Testing using Analysis of Variances (ANOVA)

Dependent Variable	Mean (S.D)			F	Results
	Low	Medium	High		
Intention to Study CS (ISCS)	Performance Expectancy (PE)				
	3.46 (1.93)	4.39 (1.54)	5.21 (1.46)	**11.92***	H1 (Accepted)
	Satisfaction (STF)				
	3.41 (1.68)	3.91 (1.69)	5.48 (1.31)	**21.71***	H2 (Accepted)
	Social Influence (SI)				
	3.64 (1.96)	3.98 (1.61)	5.45 (1.21)	**15.32***	H3 (Accepted)
	Self-Efficacy (SEF)				
	4.13 (1.99)	4.67 (1.45)	4.36 (1.88)	0.93	H4 (Rejected)
	Perceived Behavioral Control (PBC)				
	3.37 (1.84)	4.46 (1.46)	5.28 (1.59)	**13.82***	H5 (Accepted)

$*p < 0.05$

Observing figure 2, the insignificance of SEF on students ISCS is very obvious. In addition, it can be clearly noticed that students' PE and PBC have the similar influence on students' ISCS in the both shifts from Low to Medium and Medium to High. On the other hand, STF's and SI's shifts are from Medium to High rather than from Low to Medium. Hence, it seems that students' STF and SI in high levels is very helpful for students' ISCS. Overall, in Figure 2 the positive and significant influence of PE, STF, SI and PBC on students' ISCS is exhibited.
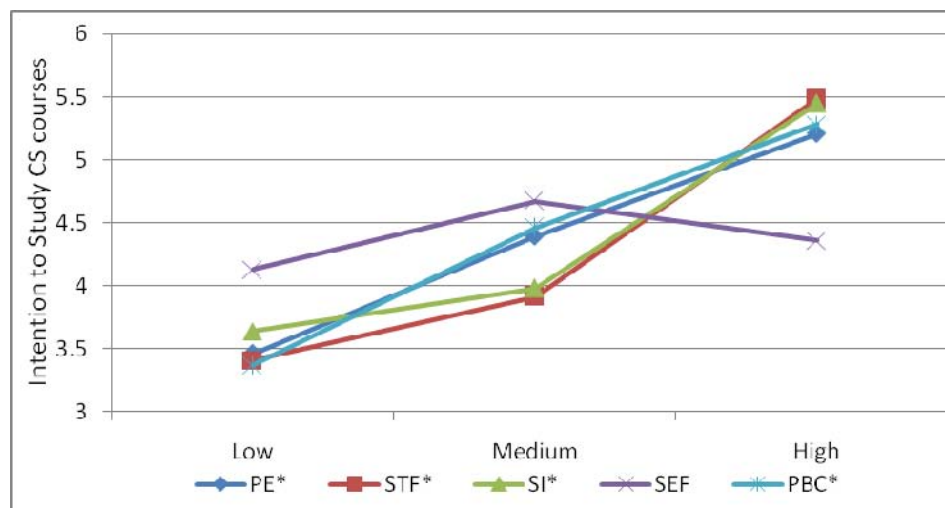
Figure2: The Influence of the motivating factors in students' ISCS

On that stage we aim to examine if the differentiation of ICT and Programming influence the relationship between motivating factors and ISCS. To examine that effect (H6a–H6e), the correlation coefficient between motivating factors (PE, STF, SI, PBC) and ISCS of the ICT and Programming students was used. Simple regression of ICT and Programming students was conducted among (PE, STF, SI, PBC) and the students ISCS. Firstly, we calculate the R for the ICT students and for the Programming Students at each one of the motivating factors. Afterwards, the coefficient R from the regression analyses and the sampling N was used to conduct a Fisher's Z-transformation analyses (Baron and Kenny, 1986). The results (table 4) mean that the difference among ICT and Programming has a significant moderating effect on the relationship between PBC and ISCS (supporting H6e). For the case of PE STF and SI the results (table 4) revealed that the difference among ICT and Programming does not moderate the relationships between PE and ISCS (rejecting H6a), between STF and ISCS (rejecting H6b) and between SI and ISCS (rejecting H6c). For the case of SEF, it is difficult to have reliable result due to the insignificance of the correlation coefficient of students on ICT course.

Table 4: Testing if the differentiation among ICT or Programming orientation moderates the influence of motivating factors on ISCS using fisher z-transformation analysis

	ICT	Programming	Significance test (<1.96)	Results
PE→ISCS				
Correlation coefficient R (N)	0.323 (71)*	0.417 (55)*	0.59	H6a (Rejected)
Z-transformation coefficient	0.335	0.444		
STF→ISCS				
Correlation coefficient R (N)	0.544 (71)*	0.403 (55)*		H6b (Rejected)
Z-transformation coefficient	0.610	0.427	0.99	
SI→ ISCS				
Correlation coefficient R (N)	0.464 (71)*	0.294 (55)*		H6c (Rejected)
Z-transformation coefficient	0.502	0.303	1.08	
SEF→ ISCS				
Correlation coefficient R (N)	0.027 (71)	0.252 (55)*		H6d (N.S.)
Z-transformation coefficient	0.027	0.258		
PBC→ ISCS				
Correlation coefficient R (N)	0.254 (71)*	0.570 (55)*	2.11[a]	H6e (Accepted)
Z-transformation coefficient	0.260	0.648		

* Coefficients are significant at 0.01; [a] Z is 1.96 for $p < 0.05$.

According to Figure 3, students with low PBC who attending ICT have similar ISCS with students with medium PBC who attending Programming. This means that the influence of PBC on ISCS can be eliminated by the influence of the different content on CS course (ICT or Programming).
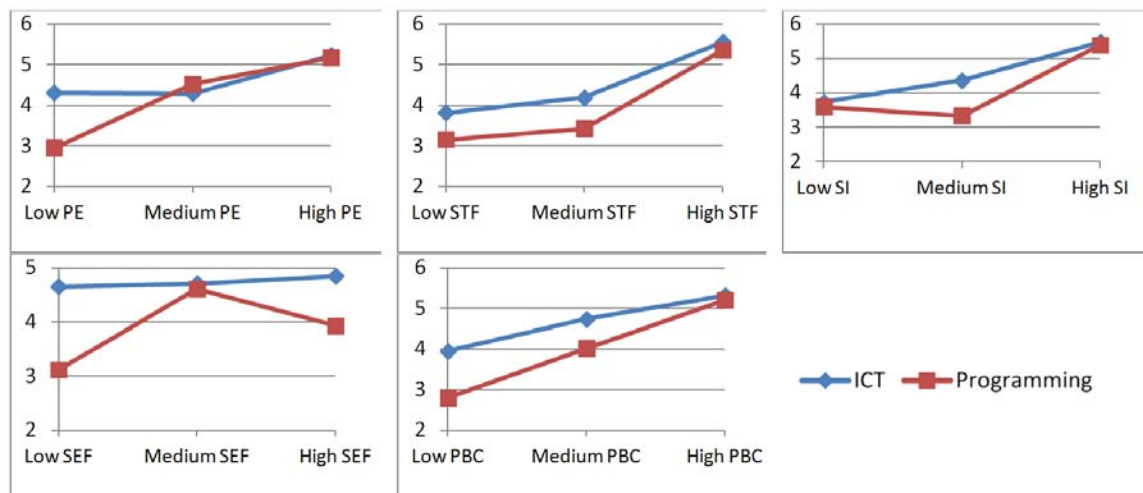
Figure3: The moderating effect of ICT or Programming orientation

CONCLUSION AND DISCUSSION

In the empirical study, students' intention to study CS was analyzed. In particular, this study measured five motivational factors regarding CS attendance and students' intention to study CS; based on the experience of two groups of students. The first group took a programming course and the second an ICT course during the 2011-2012 school year. Both respondents' groups expressed high satisfaction on ICT and Programming course respectively. Additionally, they expressed slightly lower perceived behavioral control and performance expectancy. High levels of motivating factors exhibit positive insights of students concerning their experience, control, usability and usefulness regarding CS.

Previous studies mainly focused on non-behavioral factors regarding students' likelihood to pursue CSE course, like: Gender, Ethnicity (Barker et al., 2009), Career Opportunities (Masnick et al., 2010), Teaching Methods and the Curriculum Selection (Morrison and Preston, 2009). Hence, our study opens new avenues towards the analysis of students' intention to attend CS courses, which verifies the key role of four of the five motivational factors in the context of CSE.

Especially, the 5 hypotheses (H1-H5) were formulated and the 4 of them were accepted (except H4), which help in understanding the motivating factors contributing to CS attendance. The results revealed that PE, STF, PBC and SI have a significant positive effect on students' ISCS. In addition, the results indicated that SEF is not influence students' to attend CS courses.

Another aspect of this paper is the moderating effect of Programming or ICT on the effect of PBC on ISCS. An interesting observation was that students with low PBC who attending ICT have the same ISCS with students with medium PBC who attending Programming (H6e). This means that the effect of PBC on ISCS can be eliminated by the effect of the different content on CS course (ICT or Programming).

Overall, this study contributes to the literature with many ways. First, we empirically measure students' perceptions and intentions for CSE, second we identify the effect of the motivational factors on students' intention to study CS and (3) identifies the moderating effect in the enrolment with ICT or Programming course on the relationship among PBC and ISCS. The current study is one of the few so far, where a CSE empirical assessment is employed among students who attend ICT and Programming courses.

Previous studies have shown that students' perceptions of what they learned affect their performance and what they choose to do next (Metcalfe and Finn, 2008); in addition, this study revealed that student intentions to pursue CS courses are highly affected by their beliefs. As such, the conclusions of this study are important as they indicate perceptions which lead students' on their future study and career decisions. Therefore, our findings have important implications for understanding how students perceive their learning and achievement in CSE and by taking care of that, the number of pupils making an educated decision to pursue CS can increase.

As with any empirical study, our study has certain limitations. First, the respondents are Greek students, who had attended the Greek educational system; this may limit the extend of the generalization of the findings. However, another study has been conducted among the secondary education students of Greece and Germany indicates that there is no significant difference on their perceptions regarding CS courses (Giannakos et al., 2012). Secondly, the data are based on self-reported method, other methods such as depth interviews and observations could provide a complimentary picture of the findings through data triangulation. Thirdly, there are numerous factors affecting students' behavior and perceptions (Aypay, 2010), but in our study we used motivating factors raised from prior studies as the most important ones. Last there is an age difference among the two groups (3years), this was made because we want each group to have the same exposure on the respective course, this age difference may have casual effect. However, we know from the literature that age does not impact on students' computers perceptions and anxiety (Gilroy and Desai, 1986). In addition, the results from seventeen studies (Rosen and Maguire, 1990) support the contention that age was not a significant correlate of computer anxiety (p. 181).

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APPENDIX

Factor	Operational Definition	Items*	Source Adopted
Performance Expectancy (PE)	The degree to which an individual believes that attending the respective course is useful for him/her.	Using programming improves my performance in a task. (PE1) Programming enhances my effectiveness in tasks progressing. (PE2) Programming would make it easier to complete a task. (PE3) Programming increases productivity in completing tasks. (PE4)	Giannakos et al., 2013
Satisfaction (STF)	The degree to which a person positively feels with the respective course.	I am satisfied with the programming experience. (STF1) I am pleased with the programming experience. (STF2) My decision to use programming was a wise one. (STF3) My feeling to use programming was good. (STF4)	Giannakos et al., 2013
Self-Efficacy (SEF)	The degree of conviction that one can successfully execute the operation required to produce the outcomes.	**I could complete a programming task …** if there was no one around to tell me what to do. (SEF1) if I had never used it before. (SEF2)	Shih, 2008
Social Influence (SI)	The degree to which an individual perceives that most people who are important to him think he should or should not attend the respective course.	People who are important to me think that I should learn programming. (SI1) People who influence my behavior encourage me to learn programming. (SI2)	Hsu and Lin, 2008
Perceived Behavioral Control (PBC)	The degree to which a person perceives how easy or difficult it would be to perform an operation in the respective course.	I would be able to complete programming tasks (PBC1) I have the knowledge and the ability to complete programming tasks. (PBC2)	Shih, 2008
Intention to Study CS (ISCS)	The degree of students' willingness to attend the respective course	I intend to continue learning programming in the future. (ISCS1) I will continue learning programming in the future. (ISCS2) I will regularly learn programming in the future. (ISCS3)	Hsu and Lin, 2008

EXPLORING THE FACTORS INFLUENCING E-LEARNING OF TURKISH EFL LEARNERS THROUGH TAM

Recep Cakir
Amasya University, Faculty of Education, Department of Computer Education and Instructional Technology, AMASYA, TURKEY
Tel: (+90) 358 252 6230. Fax: (+90) 358 252 62 22
E-mail: recepcakir@gmail.com

Ekrem Solak
Amasya University, Faculty of Education, Department of Foreign Languages Education
Tel: (+90) 358 252 6230. Fax: (+90) 358 252 62 22
E-mail: ekrem.solak@amasya.edu.tr

ABSTRACT
The purpose of this study was to understand the attitude of Turkish EFL learners towards technology and to determine the factors influencing the academic achievement of the learners while using technology. Survey method was used to collect data about technology acceptance of the Turkish Foreign Language Learners. This research was conducted at a state-run university in 2012-2013 academic year and subjects were 231 male and 279 female e-language learners from the Vocational Higher School taking up English course through e-learning. According to the results of the research, some of the TAM factors had effects on the academic achievement of the e-learners. It was revealed that while anxiety towards e-learning had a negative effect on academic achievement; perceived ease of use, attitude, satisfaction and self-efficacy had a positive effect on the academic achievement of e-learners. These findings indicated that Turkish EFL learners had a positive attitude towards technology in education.

Keywords: Technology Acceptance Model, e-learning, English Foreign Language, Achievement

INTRODUCTION
While Prensky (2001) names today's students as digital natives, Tapscott (1998) calls them net generation. Because they are born in a different world which is full of digital technology and this technology is an important part of their lives. Prensky (2001) states that the new generation is exposed to a huge amount of information since early childhood and therefore they think and process information much faster and are used to multi-tasking. However, they have little patience for long tasks and get bored easily. Therefore, it is vital for teachers to make a shift in methodology and learning content.

It has been proved that information and communication technologies encourage learners to make progress in their foreign language learning and motivate the learners in a positive and creative manner (Sanders & Morrison-Shetlar, 2001). Sankaran and Bui (2000) found that students who preferred courses supported with technology performed better than those who were presented in the lecture format.

However, Huang and Liaw (2005) state that, no matter how sophisticated and powerful the state of technology is, it is the user having a positive attitude towards it. Therefore, it is the purpose of this study to determine the attitude of Turkish EFL learners towards e-learning through Technology Acceptance Model (TAM) and to investigate the factors influencing academic achievement of Turkish EFL learners from technological point of view.

TECHNOLOGY ACCEPTANCE MODEL (TAM)
Technology Acceptance Model (TAM) (Davis, 1989) generated from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) offers a theoretical basis for user acceptance and usage behavior of information technology. Figure 1 illustrates Technology Acceptance Model.
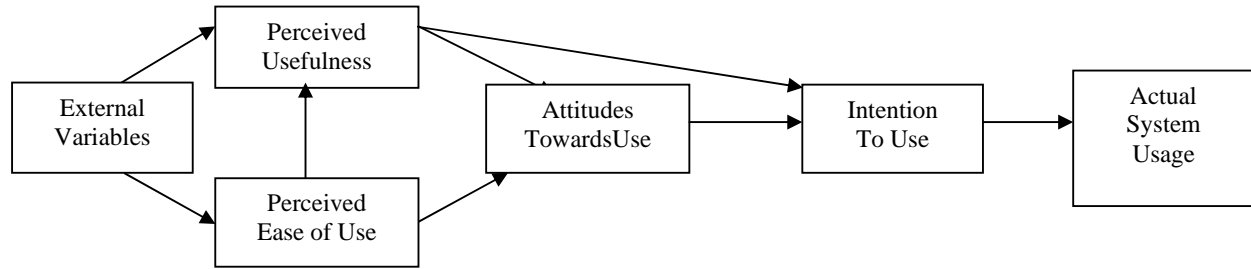
Figure 1: Technology Acceptance Model (Davis, 1989)

In TAM, there are two core beliefs as perceived usefulness and perceived ease of use which lead an individual's behavioral intention to adopt a system. Davis (1989) defines Perceived usefulness as "the degree to which an individual believes that using a particular system would enhance his or her productivity" while perceived ease of use is defined as " the degree an individual believes that using a particular system would be free of effort" (Davis, 1989). It can be stated that perceived ease of use has a direct effect on both perceived usefulness and technology usage (Adams, Nelson& Todd; 1992; Davis, 1989). Davis (1989) cites that users' beliefs are directly related to a technology's usefulness, the attitude and the intention to use the technology. It is reported that perceived usefulness has stronger relationship with usage than other variables. Moreover, an individual adopts a technology if it is considered as convenient, useful and socially desirable even though it is not enjoyable to use the technology (Saga & Zmud, 1994).

TAM is a model widely used in the studies about the acceptance of technology. This model has been adopted and expanded in many studies in various types of technologies including e-mail, word processor, World Wide Web, enterprise resources planning (ERP) systems and proved high validity.

REVIEW OF LITERATURE
Rogers (1995) states in his Innovation Decision Process theory that an innovation's acceptance is realized over time through five stages: Knowledge, Persuasion, Decision, Implementation and Confirmation. Accordingly, ''the innovation-decision process is the process through which an individual passes (1) from first knowledge of an innovation, (2) to forming an attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision'' (Rogers, 1995). In cases where technology is recently introduced into a system, the knowledge of an innovation and attitudes about it is the main focus of attention (Akbulut, 2008).

The early studies on attitudes to computer technology generally revealed that existing culture, interaction with the tutors and dialogue were the predictors of success in distance learning. Moreover, researches suggested that there was no significant difference in achievement levels between distant and traditional learners (Golonka, Bowles, Frank, Richardson & Freynik, 2014; Larson & Sung, 2009; Koçoğlu, Ozek & Kesli, 2011)

Thomas (1987) emphasizes the importance of the cultural/social norms of a country to the acceptance of technology. Thomas states, ''How acceptable a new technology will be in a society depends on how well the proposed innovation fits the existing culture'' (p.15). A user may resist a technological innovation because it may not fit within their micro- or macro-cultures. Thomas names his hypothesis as "the cultural suitability factor".As Stone (1990) argues in his assessment of interactivity in distance learning, high quality learning can occur as long as students have interaction with tutors.

Johnstone (1991) stated that there was no significant difference between distant and traditional learners in terms of achievement, but student attitudes and satisfaction levels varied considerably. According to Kirkup and Jones (1996) the success of distance learning courses cannot be predicted. They summarized the most significant disadvantages of distance education as (a) the lack of dialogue; (b) the inflexibility of its content and methodology; and (c) the isolation and individualization of the student.
Hilgenberg and Tolone (2000) maintained that the limitation of dialogue between teachers and learners, and amongst learners themselves was the most important shortcomings of many distance learning courses.

Khine (2001) corroborated with Yuen and Ma (2001) revealed that affective attitudes, general usefulness, behavioral control, and pedagogical use were significant in determining the use of ICT. Kumar and Kumar (2003) reported that the amount of computer experience had a positive effect on attitude towards computers.

Glancing at the recent literature on technology acceptance and e-learning especially through TAM, Lee, Yoon and Lee (2009) investigated critical factors on e-learning adoption in South Korea and their study proposed a research model with four independent variables as instructor characteristics, teaching materials, design of learning contents, and playfulness.

In his study, Lee (2010) combined the expectation–confirmation model (ECM), the technology acceptance model (TAM) and the theory of planned behavior (TPB) to propose a theoretical model to predict the users' intentions to continue using e-learning. The results suggested that satisfaction played the most important role on users' continuance intention, followed by perceived usefulness, attitude, concentration and subjective norm.

Sang, Valcke, van Braak, and Tondeur (2010) focused on the impact of Chinese student teachers' gender, constructivist teaching beliefs, teaching self-efficacy, computer self-efficacy, and computer attitudes on their prospective Internet and Computer Technology (ICT) use. Results indicated that prospective ICT integration was significantly related to all teacher related variables, except for gender. Tzeng (2011) investigated users' perceptions of the technology and the perceptions' association with attitude towards and intention of using the technology. The results proved that for prospective users, attitudes had the strongest significant effect on usage intentions.

Cheung and Vogel (2013) used the technology acceptance model to highlight the factors that influence the acceptance of Google Applications for collaborative learning. According to the research results, the subjective norm represented by peers significantly moderates the relationship between attitude and intention toward the technology. Padilla-Meléndez et al (2013) examined the perceived playfulness in the context of a blended learning setting with existing gender differences. The study suggested that gender differences were effective on playfulness in the student attitude toward a technology and the intention to use it.

Although many publications are available on the topic of technology use in FL learning and teaching, the role of academic achievement with regard to TAM has rarely been discussed. Golonka, Bowles, Frank, Richardson and Freynik, (2014) points out that the influence of technology on foreign language learning has been great because of the studies on automatic speech recognition (ASR).

Reviewing the current literature in TAM, perceived ease of use and perceived usefulness were the key factors in the use of technology. Apart from others, this study focuses on to what extent other factors, besides these two, influence students' achievement in using the technology.

METHOD OF THE STUDY
In this research, survey method was used to collect data about technology acceptance of the Turkish Foreign Language Learners. There have been several studies focusing on TAM in various fields so far but little attention has been paid to understanding the perceptions of Turkish Foreign Language Learners through TAM in Turkish Vocational Higher education context. This study can be considered unique, because the effects of subfactors of TAM in academic achievement are also discussed. Therefore, the results and the implications of this study will highlight a different aspect of e-learning regarding a different population.

This study will answer the following research questions:
      1. Is there a correlation between students' achievement and variables in TAM?
      2. To what extent do the variables in TAM influence the academic achievement of students in online English learning?

SUBJECTS
This research was conducted at a state-run university in 2012-2013 academic year and subjects were 231 male and 279 female e-language learners from the Vocational Higher School taking up English course through e-learning. The subjects were elected on voluntary basis and the total number was 510. The participants study English course 2 credits a week. E-learners benefit from videos, notes, files etc. prepared by language teachers in an e-learning context. Videos that are composed of 15-20 minute presentations, a discussion board which learners ask questions at any time and e-content which is supported by animations are the main characteristics of the existing e-learning program. E-learning system is at students' disposal for 24 hours.

INSTRUMENT
Recent studies and researches on TAM were reviewed and items which represented the characteristics of this study were elaborated and adopted from these studies. The scale which was composed of 34 items had the following sub factors: Anxiety (4 items), Perceived ease of use (3 items), perceived usefulness (3 items),

Attitude (5 items), Subjective norms (3 items), Perceived Behavioral control (3 items), Satisfaction (3 items), Continuance intention (3 items), Self efficacy (4 items), Facilitating Conditions (3 items). The scales were adopted from the following studies: Anxiety scale from Venkatesh (2000) and Venkatesh et al. (2003), Perceived ease of use and perceived usefulness from Davis (1989), Attitude scale from Davis (1989) and Moon and Kim (2001), Subjective norm scale from Taylor and Todd (1995), Perceived Behavioral control from Taylor and Todd (1995) and Lee (2010), Satisfaction from Bhattacherjee, (2001) and Lee (2010), Continuance intention from Lee (2010), Self efficacy from Hua, Clark and Ma, (2003) and Facilitating Conditions from Cheung and Vogel (2013).

Five point likert scale ranging from strongly agree to strongly disagree was used in the study. The pilot study of the scale was conducted on 129 students and Cronbach alpha reliability coefficient for each factor was over 0,70. The total reliability coefficient was 0,89. Then factor analysis was done to determine whether expected number of factors was present and each item was loaded in expected factor. According to the results of factor analysis, high factor loadings of all items were accumulated in its own factor and low cross loadings were displayed in other factors.

FINDINGS

The scale was administered to 565 students taking English course online. Incomplete scales and the scales with invalid markings were eliminated and finally, 510 valid markings were obtained. The demographic data of the participants were presented in the following table.

Table 1. Demographic data of the participants

		F	%
Gender	Female	279	54,7
	Male	231	45,3
Facebook	Yes	468	91,8
	No	42	8,2
Personal Computer	Yes	391	76,7
	No	119	23,3
The skill of using technology	Insufficient	0	0
	Not bad	129	25,3
	Sufficient	251	49,2
	Very good	130	25,5
Daily internet usage	1-3 hours	168	32,9
	4-6 hours	239	46,9
	More than 6 hours	102	20,2
Documents which are used in the system by students	rarely	114	22,4
	sometimes	159	31,2
	frequently	186	36,5
	very often	51	10,0
Videos are used in the system by students	rarely	113	22,3
	sometimes	194	38,3
	frequently	175	34,5
	very often	25	4,9
Exercises are used in the system by students	rarely	87	17,3
	sometimes	255	50,7
	frequently	120	23,9
	very often	41	8,2

According to the demographic data collected, each participant (N= 468, 92%) almost had a facebook. Nearly 77% (N=391) of the subjects had personal computers. While 130 (%25,5) subjects' skill of using technology was very well, 251 of them had a sufficient skill of using technology. Inaddition, %20,2 (N=102) of the participants used internet more than 6 hours a day. Analyzing the use of e-learning materials by language learners, course documents, videos, and exercises were the most frequently used ones. While 186 participants used course documents frequently, 174 used course videos at thesame rate. Furthermore, 120 of the participants studied the exercises frequently. On the other hand, very few participants stated that they took advantage of form

pages. While 42 students used the form page for technical reasons frequently, 54 subjects used foreign language course form pageat a high rate. Moreover, voice files and messages were used at a low rate.

Table 2. The Analysis of subfactors in TAM

	N	Mean	Std. Deviation
Anxiety	510	2,66	1,01
Perceived usefulness	510	3,22	,70
Perceived ease of use	510	3,43	,75
Attitude	510	3,13	,68
Subjective norms	509	3,30	,72
Perceived behaviour control	510	3,40	,67
Satisfaction	510	3,27	,69
Continued intention	510	3,02	,80
Self-efficacy	510	3,51	,81
Facilitative conditions	510	3,82	,76

Analyzing the subfactors, the mean of anxiety level to the e-learning was 2,67 out of 5. It was understood that participants had somewhat anxiety to the system though it was not high. In addition, among the subfactors, facilitative conditions had the highest mean (X= 3,83). Also, it can be stated that themean of self-efficacy of the participants wastheothersubfactorwhich had a highmean (X=3,52). Themean of attitude of the participants to the system was 3,14.

Table 3. The Correlation among the variables

	2	3	4	5	6	7	8	9	10	11
1. Achievements	-,540*	,188	,696*	,552*	,163	,404*	,133	,184	,539*	,115
2. Anxiety		,123	-,304	-,162	,047	-,170	,029	,124	-,195	,025
3. Perceived usefulness			,346	,489	,394	,416	,443	,392	,312	,104
4. Perceived ease of use				,302	,226	,251	,277	,250	,473	,111
5. Attitude					,353	,225	,374	,351	,209	,104
6. Subjective norms						,348	,231	,203	,275	,035
7. Perceived behavior control							,243	,341	,228	,118
8. Satisfaction								,306	,205	,105
9. Continued intention									,365	,146
10. Self-efficacy										,285
11. Facilitative conditions										1

Table 3 shows the correlation among the variables. According to the table, there was a correlation between variables and achievements. Results of multiple regression analysis of achievements related to the predictions of the subfactors in TAM were presented in the following table.

Table 4. The Results of multiple regression analysis of achievements related to the predictions of the subfactors in TAM

	Beta	Std. Err.	Beta	t	P	Zero-order r	Partial r
Constant	20,897	3,776		5,534	,000		
Anxiety	-5,410	,484	-,310	-11,171	,000	-,540	-,448
Perceived usefulness	-1,804	,869	-,072	-2,076	,048	,188	-,093
Perceived ease of use	9,341	,757	,399	12,344	,000	,696	,484
Attitude	7,300	,849	,285	8,597	,000	,552	,360
Subjective norms	-,842	,827	-,034	-1,018	,309	,163	-,046
Perceived behavior control	1,342	,835	,052	1,607	,109	,404	,072
Satisfaction	2,296	,763	-,090	-3,008	,003	,133	,124
Continued intention	-,192	,699	-,009	-,274	,784	,184	-,012
Self-efficacy	4,407	,678	,203	6,502	,000	,539	,280
Facilitative conditions	,105	,600	,005	,174	,862	,115	,008

R = 0,837 R^2 = 0,694
F(10,497) = 115,84   p= 0,00

Analyzing the zero-order and partial correlation between TAM subfactors and dependent variable (academic achievement), negative high correlation (r= -0,54, partial r = -0,45) was noticed between anxiety factor and academic achievement. However, positive correlation was observed between academic achievement and perceived ease of use (r= 0,696, partial r = 0,484), attitude (r= 0,552, partial r = 0,36), satisfaction (r= 0,133, partial r = 0,124) and self-efficacy (r= 0,539, partial r = 0,28). As of the other variables (perceived usefulness, subjective norms, facilitative conditions, continued intention, perceived behavior control), there was a low level correlation between these variables and academic achievement.

All variables predicted 70% of total variations in academic achievement (R = 0,837, R^2 = 0,694, p= 0,00). Analyzing the results of t-test related to the significance of regression coefficient; anxiety, perceived ease of use, attitude, satisfaction and self-efficacy factors were the predictors of academic achievement. However, other subfactors (perceived usefulness, subjective norms, facilitative conditions, continued intention, perceived behavior control) did not have significant effect on academic achievement.

DISCUSSION
This is a study aiming to understand the attitude of Turkish EFL learners towards technology and to determine role of these factors in the academic achievement of the participants. According to the results of the research, most of the participants have a facebook account and a personal computer. In addition, each participant goes online every day and spends at least   1-5 hours online. Moreover, e-language learners spend most of the time studying course documents.

This result shows that, participant use technology in their daily life regularly. This finding is in consistent with the current literature. Junco (2012) investigated the use of facebook by 2359 university students and revealed that each student spent nearly 1 hour and 40 minutes on the Facebook a day.

The present study also reveals that some of the TAM factors have effects on the academic achievement of the e-learners. It is understood that while anxiety towards e-learning has a negative effect on academic achievement; perceived ease of use, attitude, satisfaction and self-efficacy have a positive effect on the academic achievement of e-learners. These findings indicate that Turkish EFL learners can be considered at the third phase of Roger (1995) Innovation Decision Process theory. In other words, participants have a positive attitude towards technology and they are at the stage to make a decision to adopt or reject the technology.

Golonka et al (2014) investigated 350 studies related to technology and foreign language learning and pointed out that technology helped to improve learners' output and interaction, affect and motivation, feedback, and metalinguistic knowledge. Moreover, Sathe and Waltje (2008) support this finding that students are motivated to spend more time on learning activities with technology. On the other hand, Lee's findings (2010) were partly in line with the results of the present study. His study revealed that satisfaction had the most significant effect on users' continuance intention, followed by perceived usefulness, attitude, concentration, subjective norm. However, perceived behavior control was found as significant but weaker predictors.

In accordance with results of the present study, Sang et al (2010) also found that computer self-efficacy and more favorable attitudes toward computer were the strongest predictor of prospective computer use. The results of Tzeng's (2011) research were in consistent with the findings of the present study. His study also indicated that attitudes had the strongest significant effect on usage intentions. Orr (2008) stated that the IWB wholly changed the classroom atmosphere. In addition, it increased students' enthusiasm, interest, and engagement in the learning process (Tozcu, 2008), and attracted attention (Schmid, 2007).

Results demonstrate that virtual worlds could be a good resource to decrease student anxiety and increase their motivation to learn a foreign language. On the other hand, the findings of this study were not in line with some studies, for example Saade and Kira's research (2007) revealed that anxiety did not play a mediating role on the impact of computer experience and perceived ease of use. Ngai, Poon and Chan findings (2007) were partly in accordance with the results of the present study. They found that perceived ease of use and usefulness were the significant factors influencing the attitude of students using WebCT. Moreover, in the literature there are several studies supporting the results of this study implying that using technology on language learning influences students' learning (Rybak, 1984;Alastuey, 2011;Zhao, 2013;Huang, 2013;Oberg & Daniels, 2013; Wu, Lin &

Yang, 2013; O'Brien & Levy, 2008; Sykes, 2008; Shih & Yang, 2008; Sanprasert; 2009; Hoshi, 2002). For example, Oberg & Daniels (2013) compared a self-paced instructional method based on the use of Apple's iPod Touch personal mobile devices and a group-oriented instructional method of content delivery on one hundred and twenty-two first-year Japanese university students. The results indicated a significant difference between the groups on behalf of the self-study iPod Touch-based instructional method. Moreover, Alastuey (2011) investigated the advantages and disadvantages of synchronous voice-based computer-mediated communication (CMC) in a blended course of English for specific purposes. Oral tasks were carried out face-to-face with the participants in the control group and through synchronous voice-based CMC in the experimental group. According to the results of the study, achievements were significantly better in the experimental group.

Wu et al (2013) explored effects of two types of e-tutoring applications that is,text-based vs. face-to-face videoconferencing, on the grammar performance and motivation of low-achieving students. The findings suggested that although the two modes of tutoring were equally effective, the Face to face group members got rid of their negative feelings toward English to a greater extent than the text-based group members. In addition, face to face students' self-improvement in their English performance was higher and they were more likely to evaluate the tutors and the e-tutoring program positively than the TB group.

CONCLUSION
In conclusion, activities should be arranged to reduce the anxiety of online English learners because there is a negative correlation between anxiety sub factor and the academic achievement.Primarily, materials prepared should be designed to attract students' interest.
While designing materials, ease of use factor should be taken into consideration, so that students can easily use the program.

Secondly, activities and presentations should be done to introduce the program to the students via help menu and other facilities such as ease of use influence the achievement of students in online learning. In addition, explanations and clues should be given when they encounter any troubles using of the program via orientation activities (Yukselturk & Bulut, 2007). Since students' attitudes and satisfaction are the factors affecting the achievement, some researches prove that keeping the students' motivation high helps to reach higher achievement in online learning (Yukselturk & Bulut, 2007). Furthermore, intentions and continuity of the students can be followed by supervising the students and providing feedback when necessary. Moreover,as an implication for further studies, interviewing with students can provide more reliable data about online foreign language learning.

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IMPROVING UNDERGRADUATES' CRITIQUE VIA COMPUTER MEDIATED COMMUNICATION

Maslawati Mohamad, Faridah Musa, Maryam Mohamed Amin, Norlaila Mufti, Rozmel Abdul Latiff, Nani Rahayu Sallihuddin
Centre for General Studies, National University of Malaysia, Malaysia
maslawatimohamad@yahoo.com

ABSTRACT
Our current university students, labeled as *Generation Y* or Millennials, are different from previous generations due to wide exposure to media. Being technologically savvy, they are accustomed to Internet for information and social media for socializing. In line with this current trend, teaching through computer mediated communication (CMC) is highly recommended at higher institutions as students learn by doing, relating the discussion to real world issues, and the use of current social media. In this study, blog was employed in assessing students' critiques in an Academic Communication II course at the Centre for General Studies, Universiti Kebangsaan Malaysia (UKM). This study aims to investigate the effectiveness of using blog as CMC tool in encouraging students to read, analyze and information in argumentative texts critically. It also attempts to identify the challenges faced by students in using blog in completing the assigned critique task. An online survey was administered to gather feedback on the use of blog in the Critique evaluation of the course. The class instructor's reflective notes were also analyzed. The findings revealed that blog has helped the participants namely in generating ideas, motivating participation and improving their critique. However, it was also discovered that participants encountered some challenges especially technical glitches.

Keywords: Generation Y, Writing, Computer Mediated Communication (CMC), Blog, Critique.

INTRODUCTION
Technology has advanced with the use of the Internet in homes and classrooms and it has revolutionised the way information is accessed and shared. However, teaching and learning at some local higher institutions has not reformed accordingly. In view of this, local educators also face challenges in keeping up with the Generation Y, who are technologically savvy primarily for interaction purposes (Ibrahim & Mehmet, 2014). They advocate that CMC in blended learning promotes an environment whereby the users have ample opportunity to provide simultaneous feedback which are effective to enhance language learning. It is timely to use computer mediated communication (CMC) in teaching and learning at higher institutions. CMC makes it possible for individuals to gain more knowledge on the updated information in various fields. In addition, CMC allows wider opportunities for students to practice their writing skills. This is supported by Li and Tongshun (2006) who cite that CMC can bring positive effects in building up students writing competency. Their writing competency is honed through the use of CMC such as text messaging, emailing, chatting, and blogging in students' daily routines.

Lin and Fang (2010) conducted a study on CMC integration in EFL classrooms. Their findings highlight the effects of CMC on language learners' speaking and writing skills. Teachers are able to identify students' problems when comprehending their writing. Therefore, teachers could assist students in correcting their mistakes, giving comments and providing additional information. Cunningham (2011) further emphasizes that writing quality of students can be improved by using CMC because students tend to be more motivated to write for authentic reasons. Ferrazzi (2012) agrees that a significant amount of learning has transpired in these interactions. Without these social opportunities, virtual teams will struggle to create relationships. Simon (2006) notes that CMC has permeated our professional and personal lives.

This study aims to find out the effectiveness of using CMC as a tool in encouraging students to read and analyze information critically in argumentative texts, which is one of the evaluations in Academic Communication II course at the Centre of General Studies in Universiti Kebangsaan Malaysia. This course was designed to equip students with higher level of academic skills to function effectively in academic settings as it assists students in employing critical thinking and communication skills through exposure to current and global issues. In the Critique evaluation, the students were expected to apply the critical reading skills when exploring information in the argumentative texts on current issues. They critically analyze them and discuss their views in their small groups via blog. They responded each others' postings to encourage interaction and discussion. Individually, they had to produce a written critique of 650 to 700 words and sent to the class instructor via email or Facebook.

Research Objectives:
1. To investigate the effectiveness of using blog as a CMC tool in improving students' critique of argumentative texts.
2. To identify the challenges faced by students in using blog while carrying out the critique evaluation.

LITERATURE REVIEW
Theoretical Background
Our interest in developing online forum or blog for these students was sparked by constructivist theory. Constructivist theory can be divided into two; individual learning process (cognitive constructivist theory) and collaborative learning process (socio constructivist theory). Cognitive constructivist theory focuses on the individual learning process (David et al., 1999). When the students become self-directed learners, they will put much effort to navigate, develop and assess their own learning. In our study, students engage themselves in the given task which is to carry out a discussion via blog. Each idea and stance needs to be substantiated with some concrete facts or notions. Thus, they have to read extensively and intensively before they could write a good critique on an argumentative article.

Socio constructivist theory focuses on collaborative learning with others (Vygotsky, 1978). Initially, the students are not ready to become total self-directed students. In the process of becoming self-directed learners, they need to be equipped with the necessary skills (Knowles, 1998). In this study, they need to be equipped with some relevant knowledge particularly on how to critique argumentative texts effectively and how to evaluate information with guidance and assistance from facilitator and peers. The guidance is in the form of providing resources, making corrections and comments plus mentoring. The assistance of peers through collaborative learning could result in the students acquiring new skills. These resulted in the students being more critical and analytical from different perspectives on the issues discussed. Apparently, this process of peer learning which prompts the students to take successive steps in constructing new knowledge is known as scaffolding (Cole et al., 1978; Jordan et al., 2008).

Scaffolding differs from the broader use of guidance in two ways. First, guidance is only provided when the students are unable to proceed. Gradually, the guidance is withdrawn or faded when the students have already developed their competence or understanding and can act independently (Jordan et al., 2008). However, scaffolding is needed again if there are changes in the task or context. The domain in which learning is the most productive is called as Zone of Proximal Development (ZPD). In this domain, the students are not yet ready to be independent learners. They still need guidance and direction from their teacher or capable peers. Scaffolding can also be provided by the students through self-talk (Jordan et al., 2008). After they have discussed in depth via blog, they are expected to grasp the skills to write effective critique. Later, when the students are perceived to be able to work independently, they are then instructed to find another argumentative article and write individual critique.

Computer Mediated Communication (CMC) via Blog
According to Patrikis (1995) blog is a medium of free interaction between communicators. Individuals could be grouped together and carry out discussion via blog for various reasons. Moran and Hawisher (1998) mentioned that blog is an amalgam of written and spoken language. In order to replace or support face-to-face interactions, blog is always considered and adopted as an alternative platform for interactions especially if the students are physically isolated from each other (Inoue, 2007; Supyan, 2008). Blog could also be an academic platform which attempts to promote interaction beyond the classroom. It is necessary for the students to enhance their knowledge and improve their critical thinking skills so as to complete their assignments and to excel in their assessments (Nuttal, 2005).

Additionally, some researchers (Ramesh & Sanjaya, 2007; Norwati & Zaini, 2007; Inoue, 2007; Supyan, 2008) reiterate that blog enables the students to have patrons to brainstorm, expand and complementing ideas, discuss

various issues relevant to the course, develop team planning, have question and answer sessions and personal interactions. In the online discussion, the students act as teachers and motivators to each other (Inoue, 2007). Inoue (2007) also emphasized that blog is able to promote active participation among students. In this study, blog is utilized to support the discussion in class meetings. Active participation is possible if students correspond with each other regularly as if they are in an actual classroom. Active and fruitful discussion is pivotal to enhance teaching and learning process.

On the other hand, some scholars argue that the lack of nonverbal cues when discussing in blog could result in miscommunication among communicators (Walther, 1993). However, the absence of these nonverbal cues could promote more equal authority, status and turn-taking (Rice & Love, 1987). In a study conducted by Scharlott and Christ (1994), CMC via blog was found more useful to its communicators since it helps them to overcome the relationship barriers which stem from sex role, shyness and appearance. In this respect, the students would feel less inhibited to express their ideas and viewpoints. It is safe to conclude that the absence of physical visibility could also provide a lot of benefits to the target users.

RESEARCH METHODOLOGY
This study has employed qualitative research methods. Within the scope of the research, an online survey (open ended questions) and reflective notes were utilized.

Data Collection Tools
This study has used the online survey in Google Doc which was administered to 13 students after they had completed the Critique evaluation. There were eight questions posted online and students answered individually at the students' own pace. This is a participatory action research whereby the class instructor acts as a researcher in the study. Her reflective notes were also used as one of the research tools.

Participants
First year students registered in the Faculty of Medicine were required to enroll in two English courses namely Academic Communication and Workplace Communication. These students who obtained Band 5 or 6 in their Malaysia University English Test (MUET) had to enroll in Academic Communication II. MUET is a test of English language proficiency, largely for local university admission. The Band 5 and 6 scorers are considered as very good users of English. The subjects in this study consisted of 13 Medical Faculty students who registered for Academic Communication 2 course and they obtained MUET Band 5.

The Critique Procedure
In Week 2, the students in Academic Communication II course was given an argumentative text in the class and instructed to discuss in groups of 4 - 5. Learning input on critique and aspects for critique were discussed in class in relation to the text given earlier. Sample critiques were also discussed in detail in preparing the students with the task. A group blog was created and the participants had to select a suitable argumentative text to be posted in the blog.

Students wrote an individual critique which was read and shared with the group. Each student was asked to post at least two postings. This was followed by comments from group members based on the critique posted. The respondents were encouraged to respond to the comments made by others. In order to encourage the students to write substantial entries and interact frequently, 10 percent of the total 30 percent (Critique) was allocated for the postings as well as the number of interactions. Allocating marks and dividing the students into small groups were adopted as suggested by Amelia and Mohamed Amin (2007). These are important to avoid any students from becoming lurkers.

The class instructor acted as a monitor, motivator, and troubleshooter to ensure all the process was able to run smoothly. Most of the instructor's responses were given during face-to-face tutorials. The class instructor as well as the students tried to solve some of their problems together. Some of the problems are the students' unfamiliarity with the technical aspects as well as how to carry out the discussion effectively. In the introductory lesson, all students were instructed to bring their laptop and broadband device into the class. During the lesson, they carried out small group discussions via face-to-face and at the same time exchanged personal entries and comments in the blog. These steps were taken in the effort to familiarize the students with the blog as well technical knowledge since most of these students had minimal experience in using blog for academic purposes.

The online discussion acts as a scaffolding activity in preparing the students for the individual critique. In small groups, the students selected an argumentative article which was given to the class instructor for her approval

with regard to the length, topic and content. After 2 weeks of online discussion, individually, the students had to write a longer critique based on the selected argumentative article.

FINDINGS AND DISCUSSION

Primarily, this study has shown that CMC is able to bring a lot of benefits to the targeted students but there are also difficulties in its usage. The results of this study are presented and discussed according to the following aspects which are based on the open-ended questions in the online survey and the instructor's reflective notes.

1. Generating ideas for Critique
2. Motivating the students to participate in critique
3. Improving their critique skills

1. Generating ideas for Critique

Participants reported that one of the most prominent benefits of using CMC is its suitability as a platform for generating ideas. Being given ample time, these students were able to read and comprehend the critique and comments of their classmates. They were able generate, expand and complement their scope of ideas. They were able to identify more criteria and study each criterion in a more in depth manner. In other words, they could widen their perspective and thinking horizon. As the students could submit more than one posting, they could improvise their following postings based on their reading of others' postings. They could read the argumentative article for a few times until they reached a certain level of confidence to write their own critique.

These statements are reflected in the following which episodes are derived from the responses to the given open-ended questions,

> *Yes. The blog was effective in generating ideas for the critique because the group students were able to look through the critique of their friends and the comments that they received for each of their critique which **expands their scope of idea for the critique**. Immediate commenting on the critiques through the blog also allows the group students to **compare their comments with the others** and allows them to **have more flows of ideas to further comment or further critique** an article.*

> *We could **share our ideas and also improvise on another's idea** to create a more better one through discussion.*

The diverse ideas displayed in the discussion are due to the difference of their personal background which is rooted from different gender, race, family, and culture (*Each of us provided different point of views that was probably based on each person's background. Thus, the **variety of background was able to generate new ideas and new scopes)**. These made their discussion more colorful, interesting and beneficial as reflected by another participant,

> *There are ideas generated from different people with different views and perspectives on the topic discussed. Their postings **triggered me to think from different perspective."***

These findings are parallel to Dawson's (2006) statement that CMC promotes development of a learning community consisting of diverse cultural and personal background. The learning community which is the blog discussion enables students to add and relate to their existing knowledge in order to generate new ideas. Additionally, it is important to note that the interaction beyond the classroom is necessary for them to enhance their knowledge and improve their critical skills (Nuttal, 2005).

2. Improving their critique skills

In the blog discussion, students not only had to write critiques based on the argumentative article, but also provide comments towards each others' postings. They always took into account their peers and the instructor's comments in revising their written piece. They were able to conduct peer correction and provide sound suggestions to improve each other's work. In doing so, they referred to both printed and online dictionaries. Additionally, they persistently compared their work with others which resulted in them to widen their vision and perspective as well (*Others' postings and comments **trigger me to think for different perspective.**).

They knew that each stance or idea they put forth needs to be substantiated with concrete train of thought and evidences in order to convince others. In order for them to write and submit their postings, they had to do extensive reading because they need to substantiate their viewpoints not only from their own personal experience but also with facts taken from credible sources. They applied the knowledge they learnt during the class on how

to evaluate sources namely differentiating facts and opinions; evaluating source credibility; identifying author's biasness and et cetera. Hence, this repeated process enabled them to hone their writing and critical skills as claimed by three participants,

> The blog helps because we not only have to submit a minimum of two posts of our own critique on the article, but we also need to give a minimum of two comments on other students' posts. Since we have to write more than one critique, the **repeating process improves students' critique writing. Practice makes perfect :)**

> From the comments I received from the instructor and friends. **Their comments that highlighted my weaknesses and suggestion to write it in the proper way help me a lot.**

> I can learn from my other friends by reading their critiques posted on the blog. I also receive comments and suggestions from my friends in the blog, which allow me to **improve my way of writing** and most importantly, **expand my vision.**

Evidently, blog is an effective platform for students to improve their critique writing by working collaboratively.

The fear of being judged and ridiculed by their fellow blog mates is also another reason for them in putting much effort in minimizing errors and produce good piece of work. Revising their writing in the aspects of content, sentence structure and grammar accuracy is a constant effort by most participants. CMC resulted in the students being extra careful in words selection to express their thoughts considering they are from different social and academic backgrounds. This is derived in the following response, *Yes, through CMC you have to be very clear in whatever you are trying to state. Therefore, you have to be **very precise** with your words.*

3. Motivating the students' participation in blog

The majority of the participants mentioned that they felt more motivated in blog participation. The responses in the open-ended questions indicate that their motivation is due to several reasons. One of the reasons is they had to be aware of their mistakes since they knew that their postings were read by all their blog mates and instructor. Although, the grammatical errors made are not penalized with regard to marks but they still put extra effort to ensure that their errors are minimized. In doing so, they become more inspired to revise their writing at multiple times.

Besides reading others' postings, they also observed the sentence structure and vocabulary usage. Not only they demonstrated the interest to scrutinize their own mistakes, they could also identify the flaws of others. They then worked on the flaws and filled up the gap of the missing piece of information particularly the scope of ideas. The findings also highlight that the students play a more prominent role than the instructor in ensuring the development of collaborative learning. However, the instructor plays an important role in maintaining her presence in the blog community to make sure that process runs smoothly. These statements are echoed by the participants' responses:

> Yes, the blog can be accessed and viewed by the public, so every word which we **write must be carefully**. It makes students be more aware of the Internet and own speech.

> The reason that I felt **inspired is because of other participants' critique.** When I read their critiques, I was able to **detect flaws and missing piece of information.** Hence, I worked on a critique that would highlight the flaws and emphasize on the missing information.

Discussing in a blog is a new experience for most participants and due to that they faced some technical glitches in the initial stage. However, they still admitted that they had fun (… *because it was the first time for me to use a blog and I was **interested to learn the new thing in details.***)

Veermans & Tapola (2004) cited in Deniz (2014) express that the use of CMC provides pleasure and variety which could sustain students' engagement and motivation throughout their learning process. Fun teaching and learning activities heighten students' motivation level (Magee, 2010). Moreover, in this perspective, according to Magee most Generation Y is more inclined towards the integration of technology in classroom activity. Magee also believes that for most Generation Y, technology is a tool for relationship building if it is used in moderation. This statement is depicted by one of the participants' response:

> *I am **personally inclined towards using technology** to solve problems so I figured this is **the easiest pathway.***

Motivation is also viewed in the aspect of convenience which refers to the freedom to be online at any time convenient to them and ample time to think and construct sentences at their own pace. This statement is illustrated by one of the participant's comment:

> *Since interacting through the usage of a blog allows students to have more time to think about what they would like to share, it usually results in sentences that are expressed more kindly.*

Given ample time, they could construct their posting in a less pressured manner. The teacher and the students are free to choose their own convenient time and place to post their messages (Amelia & Mohamed Amin, 2007). They do not have to log on at the same time due to the fact that they do not share the same free hours.

Another motivating factor that pushed the students to comment more honestly is the physical absence. This statement is evidenced by one of the respondent's claim, *It will be **less awkward to comment on others' critique**.* This finding supports Rice and Love's (1987) viewpoint that the absence of nonverbal cues could promote more equal authority, status and turn-taking. This notion is further supported by Scharlott and Christ (1994:1), CMC was found more useful to its communicators since it helps them to overcome the relationship barriers which stem from sex role, shyness and appearance. Consequently, the students would feel less hesitant to express their ideas and correct each other. Moreover, blog as an educational platform is important in the Malaysian context. Many Malaysian students feel shy, timid and reluctant to communicate face-to-face using English which is their second or third language (Warschauer, 1999). In this regard, the absence of physical visibility provides some advantages to the target users.

Findings Related to Challenges of Using Blog

Although CMC benefits the critique discussion among the blog community, there are some challenges that restrict its success. One of the challenges is it does not provide optimum opportunities for effective group interaction compared to face-to-face communication due to lack of non-verbal cues and delayed responses. Three of the participants highlighted,

> *Face-to-face provides better group interaction compared to CMC.*

> *… wheareas face-to-face interactions provide the platform for better explanation and more effective discussions.*

> *On the other hand, face-to-face interactions could improve one's interpersonal skills, body language and nonverbal interactions.*

The instructor's reflective notes highlighted that CMC could be a highly effective platform of self-learning for mature and self-disciplined students. Even though the participants of this study were responsible, the demands of their content courses and their tight schedule restrict them to respond promptly. The delayed responses using blog slow down the process of interaction and discussion. As a result, some students felt not motivated to discuss via blog. The instructor had to constantly remind the students to respond to each other more frequently via blog. This move is parallel to Deniz (2014) who reminds instructors to closely monitor students' progress as to ascertain that students' progression is in accordance to the course objectives. In addition, he insists that necessary adjustments should be made by the instructors.

Another setback posed is low speed Internet connection around the campus resulting in breakdowns which cut off the participants from the network. In order to troubleshoot the problem, some participants either borrowed a broadband device from their course mates or bought a broadband device and paid for the Internet connection service. Thus, the participants' time online is limited by the amount of Internet access they could afford. Due to financial constraint, few students could afford to buy a broadband device. Consequently, they prefer to arrange for face-to-face discussions since the participants stay within the same residential college and study under the same faculty.

CONCLUSION

The current educational climate in tertiary education globally including Malaysia has witnessed the increase use of CMC within and beyond the classroom. Due to economic and logistic benefits, many language courses in the National University of Malaysia integrate CMC in the teaching and learning to increase the students'

opportunity to practice the English language. Despite the success of CMC in enhancing students' writing and thinking skills, our course instructors are still skeptical of integrating CMC in critique writing. Thus, this study was set out to investigate the effectiveness of using blog as a CMC tool in improving students' critique of argumentative texts and to identify its challenges.

In this investigation, it has proven that students are able to accelerate discussion beyond the boundary of time and space. CMC acts as a tool to generate more ideas after comprehending the critique and comments from their blog mates. They were able to use the ample time to revise their ideas multiple times, thus, make their writing more refined and consists more substantial and critical insights. The diverse opinions due to the difference of family background namely culture, religion and geographical location enable the students to widen their thinking horizon and be more critical. In essence, they have proven that they are able to apply the lessons in the class in critique writing via blog. Besides, their motivation which initially was driven by marks later became more intrinsic as the motivation was then sparked by their blog mates' feedback.

The results of study indicated that low speed Internet connection, the absence of non-verbal cues, and delayed responses are some of the CMC setback. Since the students are within close proximity, they prefer face-to-face discussion compared to virtual discussion. CMC is perceived merely as a medium of communication. Apparently, the students felt that face-to-face interaction could better improve their interpersonal skills.

In conclusion, this study has proven that CMC could benefit the students in their critique discussion. However, it could not replace face-to-face interactions especially for students who are logistically close and experiencing low Internet speed. In this regard, CMC could be considered as an 'add on' only. Finally, it is important to note that a course developer needs to balance out its strengths and weaknesses before embracing CMC in the teaching and learning of English. She should consider the technical facilities and support system especially Internet accessibility and high speed connection which are crucial in ensuring the success of online discussion.

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INVESTIGATING THE INTERPERSONAL AND CONTEXTUAL FACTORS GOVERN SAUDI LECTURERS' MOTIVATION IN CREATING INNOVATIVE BLENDED LEARNING ENVIRONMENT THAT WEB2.0-BASED

Sahar Alghanmi
sahar.alghanmi@postgrad.manchester.ac.uk

ABSTRACT
Sustaining success in higher education within an ever-changing landscape largely depends on academics' motivation to cope with it. Essentially, this study aims to explore the interpersonal and contextual factors that govern the introduction of blended learning in a Saudi context. A collective case study approach was employed with Self- determination theory (SDT) as a theoretical framework. Findings of this study discuss concerns associated with promoting autonomy-supportive environment in Saudi higher education. It concludes that change management strategies have to play a more open role in unleashing the lecturers' creativity on adopting innovative technologies and in teaching strategies and thereby creating a meaningful blended learning environment.

Keywords: web 2.0 technologies, blended learning environment, Saudi Higher education, lecturers, creativity, self- determination theory SDT.

LITERATURE REVIEW

- **Blended learning**

Within a rapidly changing socio-technological landscape, increasing recognition of the importance of change in higher education has been in place. Innovative methods of delivery and learning ideas have increased as a consequence of the progression in information and communication technologies (ICT) to create desired learning outcomes (Morris, 2008). In addition, the recent developments in the field of learning theories are provoking changes in education. Worldwide, blended learning environments are viewed as the promise to tackle challenges facing higher education and providing excellent learning experiences for 21st century learners (Hofmann, 2011). The rationale of blended learning emerges from the integration of the best face-face lecture practices and online based learning (Kumar, 2008).

Therefore, to reach its advantages, rethinking of pedagogical strategies are required, redesigning the curriculum is crucial and more importantly creative and innovative selection of web-based learning is needed. (Garrison & Vaughan, 2007) assert that "blended learning addresses the issue of quality of teaching and learning. It is an opportunity to address pressing pedagogical concerns, while distinguishing and enhancing the reputation of institution of higher education as innovative and quality learning institution" (p.153). The adoption of blended learning assists the university transformation by providing regular steps of change for learners and lecturers (Driscoll, 2002). (Graham, 2006) indicates that blended learning can be implemented in a variety of ways depending on the oriented-purpose namely; activity, course, programme, and Institutional levels of blend.

- **The need to re-thinking of pedagogy; Pedagogy 2.0**

A growing body of literature has emphasized the role of web 2.0 technologies in driving successful and sustainable blended learning experiences (McLoughlin & Lee, 2008; Stepanyan, Littlejohn, & Margaryan, 2010). Under the umbrella of "Web 2.0", explosion technologies are included, including blogs, wikis, video/photo-sharing sites, and social networking sites (Bower, Hedberg, & Kuswara, 2009). Pedagogy 2.0 is a "framework that aims to focus on desired learning outcomes in order to exploit more fully the affordances and potential for connectivity enabled by web 2.0 and social software tools" (McLoughlin & Lee, 2008, 2011) p.15. When applying Pedagogy 2.0, innovative instructional strategies and an instructional design model are involved (McLoughlin & Lee, 2008). Pedagogy 2.0 enables learning through action and student- centered learning as well as creating interactive, creative and reflective learning experiences. Significantly, web 2.0 technologies hold a promise to bring sustainability to e-learning due to its ability to build communities, and share and reuse content more than LMS can offer (Stepanyan et al., 2010).

- **Creativity, innovation technology and blended learning**

These two terminologies are widely mentioned in the literature of blended learning due to its nature connection. Lecturers are supposed to be creative in bringing innovative ways of blended methods. (Sternberg, 1999) defines

creativity as situation where a new things are produced as a results of the capability of individual to re-defining, restructuring, and re-producing objects, initially through, building questions around them, and then by examining them via variety of lenses and perspective. While innovation is defined by (Cardinal, 2001) as the individuals' ability to create a new methods of the way people think and do in an extraordinarily imaginative and focusing on the scale and scope of a certain organization culture. However, these two abilities are influencing by lecturers' motivation to withier be creative in finding innovative blended learning experiences or not. (Reeve, Deci, & Ryan, 2002) assert that the formulation of individuals' motivation behavior and experience is influencing by of both social context and one's inner resources within a certain context.

- **Blended learning in Saudi context**

In the context of Saudi higher education, despite the lack of the literature regarding blended learning in Saudi universities, the majority of existing literature discusses the use of virtual leaning environments ("Jusur" and Blackboard) which has been criticized as a replicable method of traditional learning environment. Traditional universities offer some forms of e-learning courses that are especially designed for a certain population of students, yet the remaining is mostly traditionally based (Alebaikan, 2010). The blended learning method is highly recommended in Saudi universities as the Ministry of Higher Education encourages the implementation of blended learning in all academic programs, yet, it is still at an infant stage (Alebaikan, 2010; Moukali, 2012). From existing literature about blended learning in Saudi Arabia, (Alebaikan, 2010), studied the perception of female lecturers and students in King Saud university, of using learning management systems (LMS) to teach blended learning courses as a consequence of the university's decision to meet increasing numbers of female students. Another study done by (Moukali, 2012) has focused on the lecturers' attitude towards technology-rich blended learning in Jazan University. Both studies conclude that Saudi lecturers have positive perception of blended learning. However these studies are not exclusive in highlighting the perception of using pedagogy 2.0 to enrich blended learning. However, one experimental study done by (Ommar, 2013) in Um AlQura University aims to test the effectiveness of Web 2.0 technologies especially social networking systems (SNS) in project-based learning. This study shows that such technologies in instructional design have a great effect not only on the students' achievements but also on their motivation to learn. Importantly, this study emphasised that lecturers and students must be trained and understand the affordance such technologies.

THE RESEARCH DESIGN

To answer the research questions accurately, rich and in-depth exploration was needed. Thus, this research was designed based on a qualitative case study methodological approach. Qualitative research is the study of a phenomenon in an open-ended manner within its context (Johnson & Christensen 2010). Case studies focus on bringing richness and depth to detailed data regarding one or multiple cases by catching the complexity of that case(s) through a selection of data sources (Johnson & Christensen, 2010; Stake, 1995). (Yin, 2003) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". (Yin, 2003) asserts that a case study is used (1) to answer the "who" and "why" questions; (2) when the behaviour of participants cannot be manipulated; (3) when it is essential to cover the "contextual conditions" as they are related to the phenomenon being studied; and (4) when there are no clear boundaries between the issue and the context. Therefore, a collective case study was the most appropriate methodology to effectively carry out this research as it meets the needs and nature of this study.

THEORETICAL FRAMEWORK

Self-determination theory is chosen as a guiding theoretical framework for this study. SDT's General Casual-Process Model, is a critical domain in understanding a faculties contextual and personality motivational factors that either facilitates or forestalls the introduction of pedagogy 2.0-based blended learning environment amongst Saudi faculties. SDT is a "macro-theory of human motivation, emotion, and development that takes interest in factors that either facilitate or forestall the assimilative and growth-oriented processes in people" (Niemiec & Ryan, 2009, p. 134). SDT consists of four mini- theories, namely, Cognitive Evaluation Theory, Organismic Integration Theory, Causality Orientations Theory, and Basic Needs Theory. This macro- theory is orientated to understand the impact that a socio-contextual environment has on individuals beliefs, thoughts and behaviour. The utility of both social context and one's inner resources is the formulation of an individuals' motivation behavior and experience within a certain context (Reeve et al., 2002). Thus, contextual and personality factors both have a fundamental impact on one's internal goals (Sheldon, Turban, Brown, Barrick, & Judge, 2003). Conceptually, individuals internalise goals when they have an autonomous personality and/or are in an autonomy-supportive environment. As a consequence of having intenalised motivation, individuals will show positive psychological feelings of autonomy, competence and relatedness when achieving their goal. These feelings reflect on their satisfaction, leading to positive outcomes such as creativity in performance (Sheldon et al., 2003).

In response to this, exploring factors that govern Saudi lecturers' adoption of pedagogy 2.0 in learning environment is essential points for successful outcomes. Thus, the objective of this collective case, studies qualitative research to explore a Saudi lecturers' motivational factors of adopting pedagogy 2.0 into their teaching practices and thereby providing a creative blended learning environment. The significance of this study is threefold;

1) Understand how lecturers view the adoption of blended learning environment using innovative technologies such as web 2.0;
2) Identify interpersonal and contextual motivational determinants that govern the success of integrating pedagogy 2.0 in Saudi higher education;
3) Highlight the future direction for effective use of pedagogy 2.0 in Saudi higher education.

Thus this research sought to shed light on the questions that:
- What are personal determinants doing to govern Saudi lecturers' adaptation of pedagogy 2.0 in blended learning environments?
- What are the contextual determinants doing to govern the success of pedagogy 2.0 amongst Saudi lecturers?
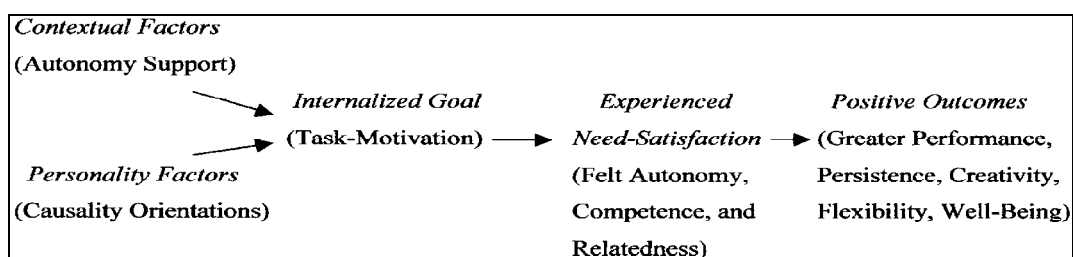
SDT's General Casual-Process Model adopted from Sheldon, Turban, Brown, Barrick, & Judge, 2003)

METHOD OF DATA COLLECTION
A semi-structured interview was employed. The interview protocol was developed as a framework to organise the interaction between the interviewees and the interviewer was implemented. Yet, it was developed in semi-structured manner to leave space for any emergent concerns. The main aim of the interviews was to make a deeper sense of how participants experience their roles and how they make sense of it. Focused on 1) attitudes towards technologies integration into education, 2) current use of technologies, 3) Describing their pedagogic practice and the change they noticed as an impact of technologies, 4) Describing their work setting in terms of the support they have, 5) their attitude towards web 2.0 technologies and other available technologies, 6) how do they see the future of technology in their field, 7) what possible barriers they could encounter when integrating them. 35 responses were received.

DATA ANALYSIS
This study takes interpretive phenomenological analysis (IPA) as a foundation of analyzing the data. The main focus, IPA, is how people are making sense of their lives and experiences (J. A. Smith, Flowers, & Larkin, 2009). The researcher plays a double hermeneutic role when trying to make sense of what participants trying to do to make sense of their experiences. The mental, and personal skills the researcher is adopting when analyzing data is similar with that of the participants' employed to generate data, however, more "self-consciously" (J. A. Smith et al., 2009). IPA usually involves a small and homogenous sample in order to make in-depth interpretations of similarities and differences between participants (J. A. Smith et al., 2009). Therefore, non-random technique was employed to select participants. They were both male and female who have teaching experiences in Saudi universities and teach different disciplines. Invitation letters were sent via e-mail to recruited participants.

In terms of process of data analysis, (Miles & Huberman, 1984) process was used in this study. During the research process, continuances, interactive and iterative process of qualitative data analysis was enduring. Data reduction refers to the process of 'selecting, focusing, simplifying, abstracting and transforming' the data (Miles & Huberman, 1994, p. 11). Using word doc helped in reducing the data by using different colours for each theme. The researcher's decision played an important role in remaining focused on important ideas. Data displays helped not only in understanding what happened but also in generating important decisions, especially when organising themes. In this study the researcher used "mindmapper" software to display the data. Conclusion drawing and verification happened as the study developed until it reached the mature version at the end of writing the report.

The process of data reduction and data display produced results that indicate the use of technology for the majority of the participants is limited on; 1) Their personal webpage within the university website where they upload all the related material of their courses; 2) Their official e-mails as a communication channel with their students; 3) PowerPoint software as an educational facilitator of knowledge acquisition. 4) Web search tools such as Google. 5) Some lecturers indicate they use learning management systems LMS tools such as "Jussur" (Saudi LMS) and blackboard, yet this use it completely limited in courses that are newly designed by administration for off-campus students and they still developed skills to deal with it.

Importantly, none of them have used web 2.0 technologies to deliver instructions. This consists with (Moukali, 2012), who studied the use technologies amongst lecturers in Jazan University. This indicates that the use of technologies is mainly text-based and does not present appropriate methods for learners especially with on-campus students. Findings indicate that some of them have no idea about what blended learning is, and what potential it could bring to their teaching and learning environment. While others clearly recognised its potential, however, they either use it as a required work in their universities, or they learn about it and understand its importance. In addition it indicates lack of familiarity with technologies concepts. This is in line with the study of (Alebaikan, 2010), that focuses on lecturers' perceptions of blended learning in a Saudi context. They also demonstrate a very traditional teaching manner.

RESULTS
- **Personality factors**

Across disciplines, sustaining success in higher education depends on academics ability to cope with change (Lane, 2007). The dominant personality factors impact the Saudi lecturers motivation of internalized pedagogy 2.0 are the notion of discipline-focused, and the lack of understanding of the importance of sustainability on pedagogical development. These are considered interpersonal factors because they are associated with lecturers' professional-image rather than socio-contextual determinants.

Needs a balanced view towards Discipline-focused lecturers
To some extent it can be said that, some faculties have a discipline-focused view that isolates them from being creative, in other words they put their mind in their discipline box. As expressed by Amal;

> *"I do not think changing my teaching strategies or adopting new technologies will add value to my context, I need to invest my efforts and time in issues related to my field.....I believe by only doing this my students will benefits a lot"*

This is in the same line with Mohammad who viewed technology as an irrelevant tool in his field as his clearly state that;
"The excellence of educational outcomes depends in the lecturers' knowledge of his/her field.....otherwise is such losing time"

With similar sound Safa emphasised that her focus is to develop her students' skills in Mathematics and not to build communication channels with them, As She said;
"Although, I can see its value, as you explained to me, I am not going to use these technologies... for example communicating with my students via twitter has nothing to do with improving students' mathematics' skills"

Individuals' goals and vision greatly influenced their action and reactions (Bandura & McClelland, 1977). In view of this, faculties minimally-perceived the value of web 2.0 technologies in their fields. This might be explained as a consequence of a lack of understanding of the importance of the culture of creativity which has been recognized as an important component in a changing "'Knowledge Age". Also, it can be explained as a resistance form of any change could result from the integration technology. Change has always been a subject of resistance amongst individuals in higher education (Beastall & Walker, 2007). Being willing to have openness to different experiences was found to be positively linked to creativity in a study conducted by (Prabhu, Sutton, & Sauser, 2008). Thus, making a balance view between a discipline-focused notions and being adaptive and innovative is a curial point to drive creative use of web 2.0 technologies.

Understanding the importance of sustaining pedagogical practice
Technology has driven pedagogical opportunities to enhance the learning outcomes. Indeed, a shift in teaching paradigm in higher education has been well documented in recent literature by (Attwell et al., 2008). Findings from the interview indicate that the pedagogical implications are much more important and more profound than the adaptation of web 2.0 technologies. Participants demonstrate a very didactic pedagogic and assessment practice. Thus, the need to re-think and re-define the notion of pedagogy within a Saudi context is more argent. Students must have an active and responsible role in their learning process. And lecturers have to provide them

with an authentic learning environment that has both technology/pedagogy-rich of activities. This is consistent with (Alebaikan, 2010), and (L. Smith & Abouammoh, 2013) that in Saudi higher education institutions, little attention has been given to measuring the impact of technologies in pedagogic practice. Questions about lecturers' pedagogic practices in favour of adopting more active and collaborative activities, such as online discussion or teamwork, were asked to highlight reasons behind a lack of pedagogic development, and the continual use of traditional pedagogic practice that is based on acquisition of information. Faculties emphasised that they do not have adequate time as a result of heavy work load as a reason that prevents them from developing their teaching methods and adopting effective learning theories which is a common For example Abdullah said;

"most of my attention is distracted to other things such office works, students' problems aside of learning and too many courses to teach. So, I think it would be better if we are provided with the chance to focus more only on teaching so we can have much more time to prepare to our lessons, provide students with more activities to practice and include different teaching materials".

Similarly, Amal relates the reason of her continual use of traditional teaching methods to the lack of time as she said;

"I have too much office hours works and I teach too much courses.... we have 12 groups of students every group consists of 70 students can you imagine that. And that of course will affect our creativity and willingness to adopt new methods and technologies; also, it needs time to be familiar with new ways of teaching..."

This is consistent with (Lane, 2007) that limiting time available for contemplating new ideas influences creative use of technologies. However, this might actually be because the lack of awareness of such technologies affordance as web 2.0 enables reducing time and efforts for both lecturers and students. This is in line with (Ommar, 2013) who concludes the importance of increased pedagogic knowledge amongst Saudi lecturers to sustain their pedagogic practice especially in the digital age. Nevertheless, some participants indicate a level of uncertainty regarding the effectiveness of force change to the traditional teaching methods and tools as clearly stated by Mohammad

"I have graduated from a Saudi university where I've studied in a very traditional manner... So, I just copy that and all my colleagues here are doing the same thing....Also, students are not willing to take the responsibility of their own learning... I am afraid if we change our teaching strategies students will fail"

Conversely with Mohammad's view other faculties show different levels of attractiveness and responsiveness towards adopting technologies and shifting their teaching styles. For example Manal expressed her experience as follow;

"Recently I started using technology in my classroom teaching and I noticed a big difference between traditional teaching (using only the textbook and the board) and modern teaching (using power point presentations, videos, pictures and so on). Students seemed to be more engaged and motivated and I used less effort in explaining new points... So I think, using web 2.0 technologies may be a good idea to foster the students' motivation"

While Nahid demonstrates a high level of encouragement and willingness

"I have been using backboard since last semester with off-campus students. It is actually an effective tool to organize the course. I love it especially the quiz function. I believe if we could use it with on-campus students as well, we will have enduring high standard educational outcomes and using the power of new technologies will enable us to more reach such outcomes"

These differences on perceived need to change might be related to the uniqueness of individuals' autonomy which has an implication on their professional self-image. In Nahid's case, she has perceived an autonomy-supportive environment as she has exposure to such technologies and perceived the required training and support to make her experience work well. As such, her vision and goals are different from that of others. Mohammad's view can be seen as the strongest attitude of conservatism such as the habit of thinking could governs the culture of creativity in Saudi higher education. Therefore, the need to spread the culture of creativity amongst a Saudi lecturers by providing the essential tools and resources and more importantly give spaces of time to help them promote their creativity levels in their fields.

- **Contextual factors**

Findings indicate that the main critical contextual factors that govern lecturers' internalization of creative adaptation of blended learning are the issues of administration and leadership style, curriculum development, professional development sessions, evaluations and rewards systems. Within Saudi universities, all these factors have essential implications on change management strategies that is at the backbone of supportive leadership.

Needs for supportive administration and policy-makers

Leading institutional transformation in the digital age is a crucial point to not only meet the students' expectations but to meet the demand of an information society as well. Many researchers identify the need for transformative leadership especially when aiming to implement innovative blended learning as more administration and policy-makers supported lecturers' motivation, the more desired learning outcomes will occur (Bonk & Graham, 2012; Garrison & Vaughan, 2007). However, lecturers' ambitions for new learning and teaching activities to better meet the needs of increasingly digital savvy learners may, disagree with management agendas. Thus, questions about barriers to Saudi faculties to creatively adopt innovative technologies and learning theories were asked by Abdullah who clearly states that one reason that might prevent him from using web 2.0 technologies is the university's rules and regulations as he said';

"Administration issues may arise as it is against the university rules and regulations because they are not official"

Safa relates her lack of using such technologies, and the motivation she has regarding it, to the lack of policy and decisions-making within her university

"Actually I don't think there are such decisions regarding using these technologies... I think that it's not good, especially in a big university like mine. As you know, the world has become more dependent on technology, especially in education and we are teaching a new generation which we can call the generation of technology. Students use technology in almost all aspects their life and when it comes to education, suddenly they are separated from technology which is not beneficial for them. We can actually motivate them to learn by using technology"

Similarly Mohammad said this on the lack of policy guide lines;

"I cannot deny the role of university administration; we have been through several stages of developments, in the last 8 years. Recently, we have collaborated with an Australian university and the curriculum has been changed completely... more teaching strategies are involved and as a result, the students seem to enjoy it. However, there is not a guiding policy regards the use of technologies, in fact, I'm not even sure if there are any...
it requires my personal effort to adjust any learning resources that could help me in my lectures"

Amal relates the administration's negative reaction to any changes made by lecturers as she said;
"To some extent they are supportive, but sometimes if I change aspects of my teaching content or adapt new technology, it takes long time to be agreed from leaders and in most cases they will reject any changes as they believe the change is not to the students' benefit"

Changing a lecturers's attitudes towards traditional teaching and assessment is an important issue that emerged from this study. This is in correspondence with (L. Smith & Abouammoh, 2013), the great majority of Saudi academics as they firmly believe that traditional teaching and learning approaches are the best way for students to learn. In addition, this results indicate that the there is a gap between policy-makers and faculties when policy-making takes place. Therefore, managing a change process requires leaders to adapt their leadership style, encourage lecturers to sustain and transform their pedagogic practices and by setting up agreed and shared goals in line with the organizational mission and vision (McPherson & Nunes, 2006). An important indication that emerged is that faculties want their voices to be heard. This can be seen from SDT perspective, as the importance to satisfy the lecturers' autonomy needs by encouraging self-regulation and be the owners and the makers their choices. This is commonly disabused in the literature of many researchers as it has been emphasised that if staff are taking a participatory role within universities the proposed changed will succeed. (Bohle Carbonell, Dailey-Hebert, & Gijselaers, 2012) stressed that creative implementation of blended learning associated with the implementation of bottom-up strategies could unleash "the faculty power of creativity". Thus, bottom-up strategies seem to be an essential point to force creativity amongst educators in higher education.

Needs for evaluation, official recognition and rewarding strategies

Recognition and rewards strategies have been seen as important factors to motivate academics' creativity in adopting e-learning means. Recognition and rewards are critical success factors of change management when universities wish successful e-learning (McPherson & Nunes, 2006). This is simply because such encouragements spread the culture of innovation and increase the creativity of academics. (Moukali, 2012) indicates if universities in Saudi Arabia wish to maintain the positive attitudes of their academics, then incentives must be provided. Thus, universities have to set up such strategies carefully. In the same line, participants clearly state the importance of recognition of efforts and rewards for innovation as required motivators. Safa states that being commended for her innovation is critical for her'; she needs her works to be valued to increase her creativity, as she demonstrated;
The equality between who is distinct in his work and who is not is an implicit reason for lack of creativity, if the

university offered rewards and encouragements change will happen as quickly as people want their work to be valued and recognized."

Safa also demonstrates the importance of encouragements;
"Without encouragements, change will not occur... I believe the power of competences makes people creative and willing to change"

Participants indicate that being reward does not necessarily mean financial rewards, yet the importance lies on being valued, as Nahid said
In my opinion rewards are an important start if we want the attitude held by many academics to be changed. This does not necessarily mean financial reward, indeed, we have to do our best and develop our knowledge.

The required recognition for innovation efforts with new technologies and the need for incentives and rewards seem to have a great effect on participants' extrinsic motivation and their competencies in their work. This can be explained by the perspective of competence needs as suggested by SDT; fulfills essential feeling of authenticity and satisfaction in taking a part of such change is important to creative performance. Therefore, leaders and managers must set up flexible, effective and fair strategies to further encourage faculties' motivation and satisfaction in the work setting.

Needs for a responsive curriculum
Curriculum development is another important issue which has arisen that has governed the innovative and creative use of technologies in a Saudi context. The size of the curriculum, dated learning objectives, required to be covered during courses has been an annoying task that has governed the creativity of lecturers. As Amal stated, there is a need for her to change the curriculum;
"The curriculum itself needs lots of changes. For me to cover the required units, whilst at the same time ensuring the students' understanding, is a source of great tension.Sometimes I give the students extra activities to strengthen aspects of their understanding."

Nahid demonstrates that to design participatory roles for her students within the current curriculum is an impossible task;
"Students have to get a greater participatory role .....I took my master's degree from US and I came here with great ambition to apply what I'd learned there ..... We really need to encourage students to take responsibility for their own learning and to be more proactive in searching for information, but, without developing the current curriculum... this is impossible .... If we could adjust the content according to the students' needs it would be great, however, we are not allowed to make any changes without prior agreement with the administration'"

Safa said the way that the curriculum is designed and the natural of her content makes any innovative impossible as it is a series of long lessons
"Mathematics is not a satiable subject to be thought through technologies ..... I have a series of modules which involve a high level of analytical thinking if the students don't understand it from the first module, they are likely to fail....I believe with traditional methods of teaching they hardly pass, how if we combine teaching with technologies. Unless the curriculum is re-designed effectively to accommodate such need or if we are allowed to adopt much-needed changes within the curriculum"

Manal raises interesting yet different points as she describe as a result of having a partnership with a western university;
"I am now teaching a new curriculum which is designed to accommodate different types of learning as well as different strategies of teaching involved... I only starting teaching it eight months ago, yet it really motivates students..... In language teaching the majority of the students enter the course with a low level of English. Some of them do not differentiate between letters ... this new curriculum is smaller than the old one but richer in meaning and quality resources, I can adapt more resources and use more collaborative teaching strategies, it really works and my students love it"

This indicates that the faculties need to be more active in designing their own courses without external interference. Amal, Safa and Nahid acknowledged that being able to adjust and adapt the instructional design is critical for their success; however, they are limited by policy which does not enable them to do that. This emphasised the needs to satisfy faculties' autonomy. In contrast, Manal has received an autonomy-supportive environment as her work setting provides her with an interactive curriculum that has given her satisfaction as she has more freedom to adjust it to her students' needs. This is in line with (Dempster, Benfield, & Francis, 2012) who feel that curriculum change requires extensive support for staff to modify their existing course designs.

Needs for sufficient professional development, support and resources

Professional development and resources are seen as essential barriers to faculties. (Borko & Putnam, 1995) state that "to help teachers change their practice; we must help them to expand and elaborate their knowledge systems" (p. 37). However, participants indicate that the lack of effective and scheduled workshops and training sessions along with a lack of available resources creates a gap between what they want to achieve and their actual practice, as Nahid explains;

"I believe the problem is that there is a gap between the training sessions offered by the university and what we actually need....another thing, it may be better if the university offer online sessions so we could find time"

In similar manner, Abdullah has stated;

"No I have not attended any professional development session in my university.... The majority of training sessions offered by the university are irrelevant to me. In addition, I usually do not have adequate time for such sessions"

Mohammad points out that he has not heard about any training sessions;

"I have not been introduced to any pedagogic workshops or anything regarding technologies at all, it would be great if the university offered some so we could develop our creativity in using technologies"

This is consistent with Amal who laments the lack of professional development sessions;

 "Unfortunately, there is no support provided for lecturers to encourage them to use technologies"

Safa makes a general statement describing her situation and that of her colleagues;

"I certainly believe my colleagues and I fundamentally need to have pedagogic and instructional design workshops"

Manal indicates that increasing awareness amongst faculties is highly important to be creative and innovative in adopting technologies;

"I believe what we need is increasing awareness of the importance of using new technologies in education, it is important to have effective and scheduled training sessions"

This can be seen as a needs competence as suggested by SDT, (to be effective in what one does, mastering new skills in the process) (Sheldon et al., 2003)e, 2003), (P. 366). This is in line with (Moukali, 2012) when studied the attitude towards using technology-rich blended learning amongst members in Jazan University, lecturers indicates that professional development and workshops related to blended learning are the main support that they need to master such skills and feel more competent. Thus, to support lecturers' competencies on current and emerging technologies, professional development programs need to be responsive to their needs.

Need to sustain technology-based innovations

The issue of establishing technological infrastructure as an important factor to encourage the various uses of innovative technological ideas has been well established in the literature (Attwell et al., 2008). Participants noted that the poor technological infrastructure creates a barrier to adopting web 2.0 technologies or other creative use of available technologies. Safa states that;

"I never used any kind of technology because the college in which I taught was not equipped with any kind of technologies except language labs"

In the same line, Amal related her lack of active use web 2.0 technologies to enrich her lessons to the lack of technological infrastructure;

"The classrooms are not equipped with the essential technological materials, in particular the internet services... Without internet in the classroom or even in the university how can we use technologies creatively?"

Abdullah puts forward the lack of immediate technological support available;

I teach afternoon classes sometimes we need support if something goes wrong... I remember once I could not use the overhead projector due to technical issues and no support was available"

From the perspective of SDT, these factors could affect lecturers' competence need in mastering skills which is a vital need to perform creatively. This finding is in line with (Moukali, 2012), infrastructure was the main barrier that faculties have faced when thinking of the adapting blended learning, for example lecturers' positive attitudes towards adaptation of technology-rich blended learning, was predicted by having an office computer.

DISCUSSION

The discussion of this study goes further than focusing on a certain type of technology such as web 2.0, indeed it raises lots of critical issues that wholeheartedly play a major role in Saudi higher education developments. When educators are required to integrate technology to assist learning, various degrees of change are likely to take a place one or more of their, attitudes, pedagogical philosophy of instructional strategies methods or approaches, or their content knowledge' strategies, and instructional materials of technology or resources (Fullan, 1998). The epistemology and ideology of sustainability and creativity is a culture that is much-needed in Saudi universities to aid individuals' creative performance. There are two main causality-orientated reasons forestall the internalisation of pedagogy 2.0 related to lecturers' personal believes and attitudes that which are;

1- Discipline-focused nature
2- Lack of understanding of the importance of sustaining pedagogical practice

Regarding contextual factors that forestall the adaptation of pedagogy 2.0, there are five main reasons which are;

1- Needs for supportive administration and policy-makers
2- Need to sustain technology-based innovations
3- Needs for a responsive curriculum
4- Needs for sufficient professional development, support and resources

Over many years the quality of the Saudi Arabian education system has been continually criticised with critical concern intended for the curriculum's content and the pedagogical didactic nature (L. Smith & Abouammoh, 2013). The reform agenda for Saudi Arabian higher education ('AAFAQ') indicates that at the level of individual universities, increased autonomy and flexibility in decision-making is highly required, so they will gain a level of responsiveness which enables them to meet the needs of communities. The degrees in which higher education institution consider being professional organisation depends on the autonomy that their academics have (Whitworth & Benson, 2007). For Saudi higher education to reach the aim of attaining and sustaining a 'world- class' reputation, a significant level of institutional and professional supportive-autonomy is greatly needed for both universities and staff (L. Smith & Abouammoh, 2013). Such important change won't be in place if the academics themselves do not believe in the importance of that change and have an intrinsic motivation towards such change. This study suggests that the way forward seems to encourage the bottom-up strategies as this could satisfy the autonomy, competence and relatedness need of lecturers.

Within this study, SDT helped formulate how contextual conditions could often stifle human development and creative growth. SDT argues that when the three common human needs are satisfied, the individual flourishes "in the same way that a plant thrives when it is given sun, soil, and water. The needs are: autonomy (to be self-regulating, to be the maker or at least the owner of one's choices); competence (to be effective in what one does, mastering new skills in the process); and relatedness (to feel connected and in sympathy with at least some others)" (Sheldon et al., 2003, p. 366). Supporting such needs by the social environment will enhance individuals' psychological growth and, in turn, their performance and creativity. (Lane, 2007) states that when innovation and creativity in educational settings become the norms, it is expected that most lecturers' members will cope with such a progressively changing world and in a routine manner they will innovatively adopt new ideas. In order to master such need within Saudi Universities' landscape an adaptive, communicative, supportive and collaborative environment require to be developed.

In light of this, one main negotiable question has emerged and was the main question in focus group discussions; what autonomy-supportive environment do Saudi faculties need to develop their creativity in general and of adopting pedagogy 2.0 in particular?

- The importance of encouraging lecturers' creative thinking by providing all essential means of tools, time, resources and training
- Develop frameworks for professional development which are relevant and accountable to their needs; in particular their autonomy competence relatedness needs
- Think of moving beyond LMS, providing them with freedom of choice.
- Encouraging bottom-up strategies with directional policy that clearly defined the responsibility and the participatory roles of each stakeholder around shared and agreed vision. Work on course design at the programme level, collaboratively engaging with as many relevant stakeholders as possible, rather than leaving lecturers working individually at module level with their usual focused autonomy.
- Develop networks by providing spaces for discussion
- Evaluate lecturers' performance and set up effective rewards and recognition strategies.
- Integrate ICT with the whole curriculum
- Develop the necessary technological infrastructure in the classroom

˙ Provide the required support for staff and students

The acquisition of satisfaction for academics in their work settings and thereby being creatively performed is occurred whenever individual's personality guiding the motivations to approach a goal that is essentially defined important by themselves too. In view of this, issues related to positively enhanced autonomous motivation must be fundamentally considered by leaders, policy-makers and professionals in Saudi higher education settings.

CONCLUSION AND IMPLICATION

Using self-determination theory (SDT) as a guiding framework widens the existing literature due to its affordance of making discussion of possible personal and contextual factors govern Saudi lecturers' motivation on adopting blended learning. SDT addresses the issues of how educational leaders and policy-makers can facilitate the lecturers' motivation and how their teaching strategies can be responsive to their learners' current and future needs by adopting creative methods such as pedagogy 2.0. This makes explicit issues related to promoting change that must be considered when planning strategies. In view of this, further in-depth investigation such as longitudinal research is required. Moreover, in this stage of research, understanding of the importance of sustainable developments was not deeply examined. Thus, further research is much-needed to examine the extent to which lecturers, leaders, and managers view the significance of sustaining their professional development in Saudi higher education. This will contribute to better interpretation of future professional development and technology integrated in Saudi higher education. Future research in a Saudi Arabian context may focus on assessing the impact of establishing bottom-up change management in supporting lecturers sustained creative use of innovative technologies. It is suggested that the use of SDT in the professional development sessions designed for lecturers will have a positive impact on their motivation. To conclude, this study focuses on examining the personality (causality orientation) and contextual (autonomy supportive) determines of Saudi lecturers' creativity in internalising pedagogy 2.0 in their traditional classes and thereby, enhancing the blended leaning environment. The importance of identifying such determines is because it helps to construct a greater understanding of the issues preventing Saudi lecturers from being creative and adapting pedagogic approaches by utilising web 2.0 technologies.

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MOBILE DEVICES: TOYS OR LEARNING TOOLS FOR THE 21ST CENTURY TEENAGERS?

Ch'ng Lay Kee
Centre for Instructional and Multimedia, Universiti Sains Malaysia, Penang, Malaysia

Dr. Zarina Samsudin
Centre for Instructional and Multimedia, Universiti Sains Malaysia, Penang, Malaysia

ABSTRACT
Learning is interwoven in daily life and so it can be take place at anytime and anywhere by using mobile device. In the 21st century, mobile devices have become ubiquitous, affordable and accessible for the teenagers. The teenagers have the opportunity to perform the learning activities by using the mobile devices. However, what are they used their mobile devices for? Many quantitative studies have been done for investigating the perception of technology use in education, but the studies done do not specifically focus on the use of mobile devices into ubiquitous learning by the teenager especially in Malaysia. Therefore, this research is conducted to obtain an in depth understanding of the usage pattern of the teenagers on their mobile devices and to clarify to what extent they used the mobile devices in performing learning activities. The study also analyzes the factors affecting the teenagers from using mobile devices to perform learning and provides a snapshot of how the teenagers perceive the use of mobile devices qualitatively. The study shows that teenagers possessed positive attitudes towards using mobile devices in performing ubiquitous learning. The teenagers perceived that the mobile devices can be used for gaming, entertainment as well as learning because they are very convenient, fast response and easy to use to access to knowledge of information. However, using mobile devices to perform ubiquitous learning is much depends on the individual's preference, interest and self-motivation. Learning facts, languages and skills using mobile devices are the most preferable activities among the teenagers.

Keywords: Ubiquitous learning, mobile devices, teenagers

INTRODUCTION
With the development of Information and Communication Technology (ICT), everyone has the opportunity to explore in the world that is full of information by using various types of technology devices. The role of these technology devices also could not be neglected. According to Fabunmi (2012), ICT is now the modern means of improving teaching and learning in the education system. At the same time, Livingstone (2012) also agreed that both educational institutions and homes, information and communication technologies (ICT) are widely seen as enhancing learning.

According to the reports on global ICT trends in the year 2012, 92% of the world's population now has a mobile phone (ITU, 2013) and 78% of the teenagers from age 12 to 17 own a cell phone and almost 50% of them indicated that their phone is a smartphone (Lenhart, 2013). The ubiquitous availability of these portable devices has changed the learning methods and learning strategies of today's teenagers. In the MNC Horizon Report 2012, there is a research indicates that the tablets are the foster key to 21st century skills in education which includes creativity, innovation, communication, and collaboration in students due to the design of the device that make the user easily to share their screens (Johnson, Adams, & Cummins, 2012). This has shown that the teenagers in this mobile-technology era can perform ubiquitous learning easily. They can simply gain access to the information and content from different resources in the web. Furthermore, the teenagers have more variety of choices to obtain knowledge and information. Hence, this study is conducted to analyze the usage pattern of the teenagers and also to provide a snapshot of mobile and ubiquitous learning in the 21st century.

Problem Statement
Various studies have investigated student's readiness, attitude and perceptions towards mobile learning by using quantitative method (Al-Fahad, 2009; Donaldson, 2011; Rahamat, Shah, Din, & Aziz, 2011) or examining the challenges and opportunities of mobile devices supporting teaching and learning in a designed learning context (Cobcroft, Towers, Smith, & Bruns, 2006; Serrano-Santoyo & Organista-Sandoval, 2010). Most of these researches are mainly focus on the study of formal learning. However, qualitative research on identifying teenagers' perception on using mobile devices as educational tools for ubiquitous learning is yet to be conducted. Thus, the research is carried out to investigate teenagers' preference and perception of using mobile devices in ubiquitous learning. As the trends go by, the technology has been emerged onto the students' daily life. Most of

the students are known as digital natives and the research is ought to be carry to listen to the students especially the teenagers in school who is so close with the technology. With the ubiquitous availability of these portable devices, to what extent the teenagers are using these devices to perform their learning is still unknown. Thus, this study creates a better understanding of identifying the influencing factors of integrating mobile devices as learning tools by the teenagers.

Research Objectives
The purpose of this study is to explore teenagers' perceptions of learning and engagement that occurs as a result of using mobile devices in performing ubiquitous learning. The specific objectives are stated as follows:

i.   To figure out the level of usage of mobile devices by teenagers.
ii. To observe and track the usage pattern of teenagers using mobile devices.
iii. To explore the experience of teenager using mobile devices in ubiquitous learning.
iv. To identify the influence factors towards the teenagers' attitude of using mobile devices in ubiquitous learning.
v.   To identify methods of acquiring knowledge of information by using mobile devices.

Research Questions
The specific research questions are stated as follows:
i.   How often the mobile devices are used by the teenager?
ii. What is the usage pattern of teenagers using mobile devices?
iii. What experiences do teenagers have in using mobile devices in ubiquitous learning?
iv. What are the stimulating and deterring factors influencing teenagers' attitude in using mobile devices to perform ubiquitous learning?
v.   What are the methods used by teenagers in acquiring knowledge of information by using mobile devices?

Limitations of the Study
The study has the following limitations that can be remedied in future research:
i.   This study is geographically limited to Penang State, Malaysia.
ii. Response is limited by the participants' willingness to honestly self-report and ability to reliably recall.
iii. The results come from a single community and may not be generalized to another community.

LITERATURE REVIEW
The Trends of E-learning, M-learning and U-learning
The development of the ubiquitous learning (u-learning) is related to e-learning and m-learning. Dochev & Hristov (2006) identified that the ubiquitous learning is tightly connected with the general e-learning progress. According to Yahya et al. (2010), the advancement of computing and communication technologies have promoted the learning paradigms from conventional learning to electronic learning (e-learning), from electronic learning to mobile learning (m-learning) and now it is evolving to ubiquitous learning (u-learning).

The E-learning
Garrison (2011) pointed that the term 'e-learning' has come into use in the mid-1990s along with developments in the World Wide Web and interest in asynchronous discussion groups. In late 1990s, e-learning is formally defined as electronically mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge. The technological foundation of e-learning is the internet and associated with the communication technologies. With the development of technology, the abundance of resources and relationships made easily accessible via the internet. Wikis, Educational Blog, Virtual World and Podcast are the tools of Web 2.0 providing a platform for the development of e-learning (Gaiyert, 2008).

The M-learning
Taylor (2011) identified that mobile technologies has changed the practice of many people's social life compared to the previous ICTs due to the reason of the previous ICTs were not so intimately connected to the trajectory of a person's social live. This has shown that, the innovation of mobile technologies has made mobile devices become a part of individual's daily life. In the last decade, the ICTs is only used in classroom, however, with this dramatic change in mobile technology, it promotes a new way of learning which mobile learning is. Through the mobility of the devices, learners can perform their learning at anyplace and anywhere. As similar to the view of Pegrum (2013), a mobile handheld device makes m-learning and e-learning qualitatively different. This can be observed through the nature of these mobile devices, they lead to an expansion of the spaces and times of learning, where the students can perform their learning outside the places of formal education and also the hours

of formal timetables. Besides, mobile learning can also be integrated with non-learning activities such as shopping or entertainment (Sharples et al., 2005).

The U-learning

According to Lyytinen & Yoo (2002), the evolution of ubiquitous computing has been accelerated by the improvement of wireless technology and the flexibility of the technology. In general, a widely accepted definition of mobile learning is using mobile technologies to facilitate learning while a popular definition of ubiquitous learning is emphasizing on the learning context where learning can happen at anywhere and anytime with the ubiquitous tools (Hwang, Tsai 2011).

Tsai (2011) indicated that ubiquitous learning is usually defined as an education system that uses the technologies of ubiquitous computing, wireless communication, mobile devices and context-aware technologies in an educational context. Therefore the u-learning placing less emphasis on mobility and contextual independence, but it is more emphasis on the contextualized and situated learning that mobile devices can be provided (Pegrum et al., 2013). In general, Yahya, Ahmad, Jalil & Mara (2010) and Hwang & Tsai (2011) defined that u-learning is using mobile devices as the learning tools in accommodating learners' learning style regardless of the constraint of time and space. Thus, in other words, ubiquitous learning can be defined as the application of mobile technology in the learning process at anytime and anywhere.

Mobile Devices and Ubiquitous Learning

Lee, Lee, & Kweon (2013) indicated that mobile devices can be used to deliver digital textbooks and other educational content to students at anywhere and anytime, and they can effectively contribute to the early growth of ubiquitous learning in education. Besides, Devaney (2012) discovered that the students used mobile technology in school for creating presentations and media, play educational games, and conduct virtual experiments. These activities are more to self-directed and self-paced learning and thus it shows that mobile learning can used to support micro-learning as long as the learning resources are well-designed and developed (Yuan & Guo, 2013).

The Usage Pattern of Mobile Devices by the Teenagers

Rideout, Foehr and Roberts (2010) highlighted that over the past five years, the ownership of laptop, cell phone and iPod has increased dramatically. Research has shown that majority of young people now carries devices on which they play games, listen to music, and, in many cases, connect to the internet and watch videos (Rideout, Foehr, & Roberts, 2010). Both *NMC Horizon Report (2012 K-12 Edition)* and Rideout, Foehr and Roberts (2010) have identified that mobile devices become one of the primary ways that the teenagers interact with and learn from each other and rapidly cemented its place as a media delivery platform for young people. Moreover, Lenhart (2013) also found out that the smartphone adoption among the teenagers has increased substantially and mobile access to the internet is pervasive in the *Teens and Technology 2013 report*. In the case study, Vahlberg (2010) summarized that the list of activities of teenagers go online which included commenting on friends' pictures on social networks, commenting on friends' pages or walls, sending private messages on social networks, going online to obtain news about current events and politics, sending instant messages or text messages on social networks, buy things online and sharing content. The finding has shown that cell phone and internet have become ubiquitous in teenagers' daily life.

The Use of Mobile Devices in Learning by the Teenagers

Smartphones, tablets and other mobile devices become ubiquitous and are overtaking desktop PCs in popularity, especially with younger users (Pelleg, Savenkov&Agichtein, 2013). Pegrum, Oakley and Faulkner (2013) claimed that a key advantage of smartphones is that many students today already own these devices and carry them with them at all times.

As summarized by Oblinger (2003), the key traits of today's students as being digitally literate, 'always on', mobile , experimental and community oriented (Cobcroft, Towers, Smith, & Bruns, 2006). These students are born in the technology-era, hence, they explore, adapt and use the technologies in different kind ways. Indirectly, the pattern of learning for the generation of digital native has moved towards into the trends of ubiquitous learning and self-paced learning if they integrate the mobile devices into learning. However, to what extent the mobile devices use for ubiquitous learning by the teenagers is still unknown.

Recent research shows the interest in the use of application of mobile learning. According to Petrova and Li (2009), mobile learning has attracted significant research interest in recent years, the research topics includes the theories underpinning learning design and factors affecting learner experiences and influencing mobile learning adoption including social interaction. Besides, some of the researchers have shown the interest in studying the

acceptance and engagement of students towards mobile learning in higher education (Al-Fahad, 2009; Donaldson, 2011; Jairak, Praneetpolgrang, &Mekhabunchakij, 2009; Martini, 2011; Rahamat, Shah, Din, & Aziz, 2011).

Many researchers focus on mobile learning while some researchers have started to investigate the ubiquitous learning over the past few years but the studies were mainly focus on the ubiquitous learning with the context aware support system in designing an environment (Hwang, Yang, Tsai, & Yang, 2009; Jones & Jo, 2004; Ogata & Yano, 2004; Yang, 2006). Although there are some research studies shown that the major usage of the mobile devices among teenagers (Lenhart, 2012; 2013), but little research appears to have an in-depth understanding of teenagers' usage pattern and preference towards the mobile devices in learning. In the meanwhile, research has not examined the perception, attitudes and acceptances towards integration of mobile devices into ubiquitous learning by teenagers. Besides, most of these researches employed the quantitative method in acquiring the outcome. With the innovation of technology, ubiquitous learning by mobile devices has become common and learning can happen on every individual but there was still little qualitative research has done to identify the determinants for teenagers use and preference of using mobile devices in ubiquitous learning.

Perception of Mobile Devices in U-learning among Teenagers
Learning cannot be separated but interwoven from other daily activities. These daily activities include conversation, reading or watching television and they can be the resources and context for learning (Sharples, Taylor et al., 2005). Based on the research conducted by Baya'a and Daher (2009), learners perceived the uses of mobile devices in learning as playful, dynamic and in the nature, moreover, the learners have the opportunity to explore the learning subject independently as well as through the collaboration of team work. Besides that, based on the study done at the Saudi Arabia University by Al-Fahad (2009), the majority of the student indicated that mobile devices with wireless network increase the learners' flexibility in engaging into various types of learning process, therefore, the mobile technologies are perceived as an effective tool in improving communication as well as individual and team learning.

Hussain and Adeeb (2009) also identified that students use different kinds of portable technologies and devices that promote mobility and flexibility in terms of time and place. The study from Rahamat et al. (2011) confirmed that students are technologically, economically and competently ready with the use of mobile technology in their learning.

From the article of eSchool News, Devaney (2012) stated that students preferred personalized learning with the use of mobile technology. In practice, Malaysia has little qualitative research on the teenagers' perception and attitudes on using mobile devices in performing the ubiquitous learning which is more to self-oriented learning.

METHODOLOGY
The research used qualitative method with supporting by quantitative data.The quantitative method has been used in figuring the level of usage and usage pattern of the teenagers using mobile devices in a certain period of time. The quantitative data is used for supporting the qualitative evaluation for each individual. The qualitative method is focused on subjective and perceptual aspects of the teenagers' personal background and self-related experience in using mobile devices and how they integrate the mobile devices into learning process which this research is mainly focused on. Furthermore, in order to gain the necessary insights into the process of integrating mobile devices into ubiquitous learning, particularly at the interface between the subjective and the background and experience of the teenagers, the qualitative method is selected for the study.

Research Design
The research has been carried out in Penang state, Malaysia. Six teenagers have been invited to take part in the study. They are of different gender from three age groups, which are 13, 15 and 17. Each participant has been engaged in two semi-structured interviews separately. The semi-structured interview will allowed the participants to bring out new ideas during the interview. However, an interview questions which is in accordance with the research objectives and research questions has been prepared in advance as the outline to follow in the interview session. The interviews have been recorded by audio recorder with the participants' permission and then transcribed verbatim.

Research Procedure
Two sessions of interview have carried out. Six participants have been interviewed by the researcher for between forty minutes to one hour separately in each session. All interviews have been recorded by notes and recorder with the permission of the participants. The first session of the interview reveals the background of the

participants, figures out the level of usage on mobile devices and identifies their experience towards the use of the mobile devices in performing learning.

After the first interview session, the participant is required to learn how to use prezi by using their mobile devices. Besides, the daily activities checklist has been given to the participants to fill about their daily activities and how much time they spent on the mobile devices in a week. Participant daily activities checklist was to track the usage pattern of the participants in a week using mobile devices.

The second interview has been carried out to investigate each of the participants' perception of using mobile devices in performing their learning tasks assigned after a week. The participant has been required to explain the method they used in performing the learning tasks assigned and showed how they understand the process of learning by using mobile devices with an explanation and demonstration. From this session, the study of the deterring and stimulating factors and attitude towards using mobile devices in ubiquitous learning and the methods of acquiring knowledge of information by using mobile devices have been identified. After the interviews, the recordings have been transcribed into the computer files. The data have been interpreted manually.

Instrumentation
A list of 22 interview questions has been prepared. The interview questions have been categorized into two sessions. First session consists of four parts: (A) demographics; to understand the background of the participant by asking the participant fill in the participant background checklist, (B) ownership, accessibility and level of usage, (C) usage pattern, (D) experience .The second session of the interview consists of two parts: (E) attitudes towards the use of mobile devices in ubiquitous learning and (F) method used.

The participant's background checklist and daily activities checklist were the second instrument to collect the data to identify the participant background and to figure out the level of usage quantitatively. From the daily activities checklist, the learning activity and non-learning activity are observed.

The instruments have been verified by the experienced lecturer from a higher education institution with at least 8 years of teaching experiences in the field of teaching English language. The pilot study has been conducted to prove the validity of the instrument in the study. Two participants were invited to take part in this study. This is to show and prove the reliability and validity of the instruments.

DATA ANALYSIS
There were six participants took part in this research and their gender and age can be seen in Table 1.

Table 1: Category of participants

Age	Male	Female
13	Participant A	Participant B
15	Participant C	Participant D
17	Participant E	Participant F

Five participants claimed that they own at least two mobile devices in their home. Majority of the participant agreed that owning a mobile device is a need in the 21st century. However, the frequency of the usage varies among the participants. All of them claimed that they had the experience of using the mobile devices in performing learning for at least a year. Four participants claimed that they used mobile devices to learn were mainly driven by their curiosity. Three of the participants used mobile devices to look for the things they interested in and some participants used mobile devices to perform some hobby-related learning tasks. Non-learning activity performed by the participant is slightly higher than the learning activity using mobile devices among the participant. The non-learning activities included use social networking site or instant messenger for chatting, check emails, read news, play games, listen music and watching video. However, the activities done for non-learning tasks are varied. The level of usage among the participants can be seen in Table 2.

Table 2: Level of usage among the participants

Participant	Use of mobile devices			Comments
	Total hours spent (hours)	Learning activity	Non-learning activity	
		Level of usage (%)		
A	65.9	0.3%	99.7%	Use for social networking especially chatting with friends
B	40.8	7.4%	92.6%	Use for gaming and search for information
C	17.7	17%	83%	Use for multitasking
D	57.3	37.5%	62.5%	Consistent ubiquitous learner and also use for multitasking
E	24.4	6%	94%	Use as communication tools and look for news
F	26.4	51.1%	48.9%	Consistent ubiquitous learner and social networking

The level of usage of mobile device in learning activity for participants D and F are high among the six participants. Whereas for the participant A, the level of usage was extremely low. The level of usage in learning activity for Participants B and E were low too. On the other hand, Participant C who use the mobile device for multitasking was slightly higher than participant B and E.

Differences between male and female participants
It has been found that three of the male participants shown low usage of using their mobile devices in performing ubiquitous learning compared to the female participants. Two male participants used the mobile devices for communicating and social networking purpose. Another male participant showed low usage of mobile devices in all type of activities. In the meanwhile, the level of usage for three female participants ranged between medium to high for both learning and non-learning activities. Two of the female participants were the ubiquitous learner. For the eldest participants, both affirmed that they will share their content knowledge with their friends because they think that it is good to share and wanted their friends to know and being knowledgeable. However, for the rest of the participants, they said that they will not share what they learned because they thought that their friends may not be interested in the content of their learning and thus learning by using mobile device is considered as personal activity.

Similarities between male and female
From the observation, YouTube, Google and Wikipedia are the most preferable website for the participant to learn and to obtain information. As such, all the participants used their mobile devices to access to these websites in helping them to perform assignments and projects in school due to its conveniency. Besides, four participants spent relatively more hours on Sunday. It has been found that high frequency of usage also been observed on a Friday or weekends. Friday is the last day of school in a week, hence, without the time constraint teenagers spend most of their free time in using mobile devices during Friday and weekends. A female participant spent 6 to 8 hours in performing the learning activities using mobile devices during the weekends. This was the longest hour spent in learning activities among the participants. For the rest of the participants, who performed learning by using mobile devices, they just spent one to two hours per day on the learning activities. This has shown that some of the teenagers' concentration on learning using mobile devices is relatively short compared to other activities.

Participant A
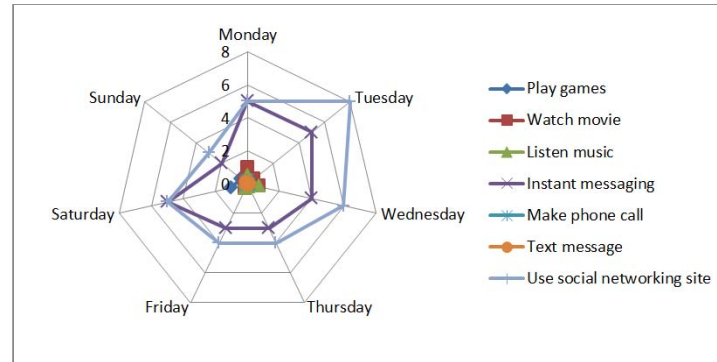
Figure 1: Usage pattern and level of usage by participant A

From the findings, participant A was a passive learner. Participant A spent an average of nine hours using mobile devices in a day. He only played games during the weekends as gaming was only allowed by his parents during the weekends. He watched videos, logged into social network sites, and instant messaging every day. He spent very long hours in these activities. Besides, he spent relatively much time on chatting with friends by using Facebook. He downloaded dictionaries which were "English-Chinese dictionary" and "Urban dictionary" to learn new vocabulary. This is the only learning activities performed by him using mobile devices. From the findings, participant A only used the downloaded dictionary once in a week to check on new vocabulary. In general, participant A used his mobile devices for gaming, entertainment and social networking purpose.

Although participant A spent very little time in performing learning activities using mobile devices, but he perceived that he learned vocabulary and general knowledge from the games he played using his mobile devices. One of the games is GTA gaming (Grand Theft Auto). It is the video game series and the series is set in fictional locales heavily modelled on American cities. Participant A claimed that he learned the name of a few American cities through the game. Besides, the game "Romance of the Three Kingdoms", it is a series of turn-based tactical role-playing simulation grand strategy war games enable him to understand and learn the history of the three kingdoms in China during the period of A.D 220-280. Furthermore, from the DOTA (Defence of the Ancient), he claimed that he had learned many new English vocabularies from this real time strategy video game. Although gaming is being labelled as non-learning activity in the first place, however, from the findings, it can be observed that an individual can learn from games in the mobile device.

Participant B
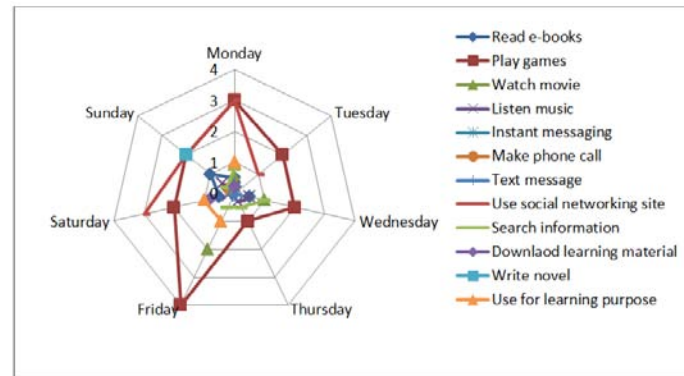
Figure 2: Usage pattern and level of usage by participant B

Participant B spent an average of five hours using mobile devices daily. The level of usage is relatively high on Friday to Monday. Participant B used mobile devices for different kind of tasks. She spent most of her time in gaming and social networking sites. The main activity performed by her using mobile devices was playing games. She only performs ubiquitous learning in three days in the week and two of the days were on the weekend.

Participant B likes to use her mobile devices because the mobile devices can perform all types of tasks she wanted. She perceived that learning can happen as long as she is interested. She said that "*For me, learning can*

be at anytime and anywhere…. From reading e-books, I can see the improvement in my English subject in school…I learned how to make rabbit cage, how to design bottle from YouTube video…. From the lyrics of the music, I learned English and Korean Language… Besides, it (mobile devices) helped me to translate the words that I don't know. From the findings, mobile devices have prepared a good platform for her to perform her ubiquitous learning especially watching YouTube video to learn certain drawing techniques. She claimed that this has not been taught by the school teachers. Besides, the mobile devices enable her to perform school project easily because knowledge of information are all time available online. She is interested in writing novel and reading others novel from a website named "Fan fiction". She claimed that from this website, she can practice her writing skills and improve her English grammar through reading.

Participant C
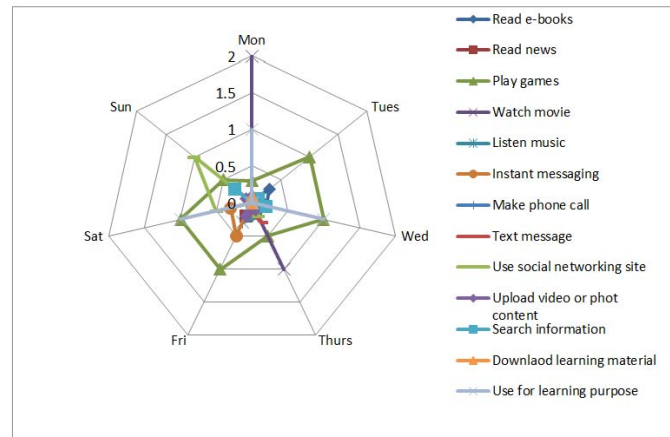
Figure 3: Usage pattern and level of usage by participant C

The main activity that constantly performed by participant C is using mobile devices to play games. Participant C spent around two hours daily using mobile devices. Participant C fully utilized the function of mobile devices by performing various tasks even though the time he spent on mobile devices is relatively low compared to other participants. This is because his parents only allowed him to use mobile devices for few hours per day. In addition, the time spent on ubiquitous learning is relatively low and he only performs it on selective days. Most of the activities done by participant C were within 30 minutes. He spent the longest time in watching video form YouTube and he mentioned that he subscribed to a few entertaining videos on YouTube.

He is interested in science and the universe, hence mobile devices enables him to learn the facts by searching the knowledge of information online. He blended the formal and informal learning by using mobile devices. He used the mobile devices to complete the school project. Besides, he used mobile devices to look for information and knowledge clarification if he found any doubts in his study especially on science subject. In addition, he downloaded e-books to read as he thought that books are expensive and downloaded e-books are free of charge. He was affected by his friends two years ago where owning a mobile device is a need for him as he would like to be an "up-to-date" teenager.

Participant D
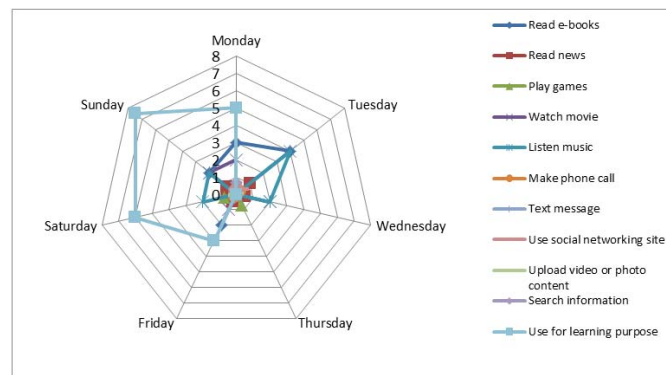
Figure 4: Usage pattern and level of usage by participant D

From the findings, participant D is an active learner by using mobile devices. She also used her mobile devices to perform various tasks. Participant D spent around five hours daily using mobile devices. Her usage was relatively high during the weekends. She spent most of her time in performing learning using mobile devices especially from Friday to Monday. Besides, she spent around two hours in performing non-learning activities in other days.

The learning activities she performed by using mobile devices are learning broadcasting skills through a website named "YYyuyin". It is a network-based voice communication platform. The teaching activities included singing, dancing and speaking. Participant D used this platform to learn the speaking and singing skills. She can interact with other online user and learn from each other through this platform. The online teacher will correct and comment on her tasks performed. This is where she felt the learning is happening and she learned the technique of broadcasting. She mentioned that "*From school, I learn nothing. Like the skill of broadcasting and drawing. Teacher doesn't teach the skills but just give suggestion on our work. I have to learn by my own. Through the mobile devices, I learned the skill of singing, health information, philosophy, history…..and sometimes the knowledge wasn't even mentioned in my textbook.*" From the observation, participant D can perform the ubiquitous learning independently because of her motivation and interest; the learning task can be carried out at any time.

Participant E
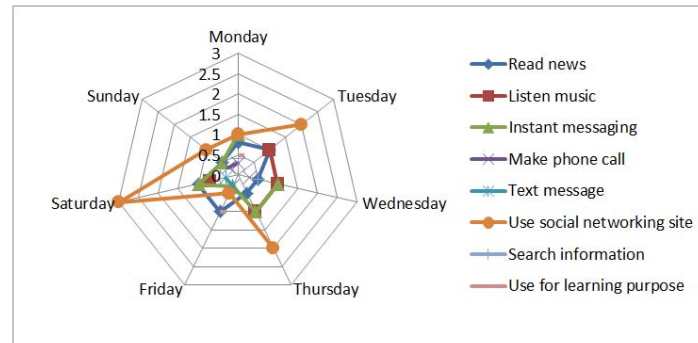
Figure 5: Usage pattern and level of usage by participant E

Participant E used his mobile device in messaging and social networking. His only mobile device was the smartphone. Participant E was the one who only owned one type of mobile device among the participants. He spent an average of two hours using his mobile device daily. He seldom used his mobile device to perform learning activities. He claimed that the only learning activity performed by him was searching information when he has some doubts in his study. Besides, participant E used Facebook as one of the tool for obtaining the news. He claimed that he has to read the sports news every day. He spent relatively long hours in social networking site on Sunday. The activities performed by him were chatting with friends and reading news.

Participant E perceived mobile device as a communication tool. He spent most of his time using mobile devices to chat with his relatives and friends. Besides, for learning related activities, participant E downloaded the dictionary apps where he needs it for translation purpose and learning new vocabulary. This is the only learning related activity performed by him using mobile device. Participant E explained that he had been using the mobile device to perform ubiquitous learning in the past few years, however; it has been maintained for a short period of time due to his lack of interest. The learning activity performed by him before was learned the origami through from the YouTube video.

Participant F
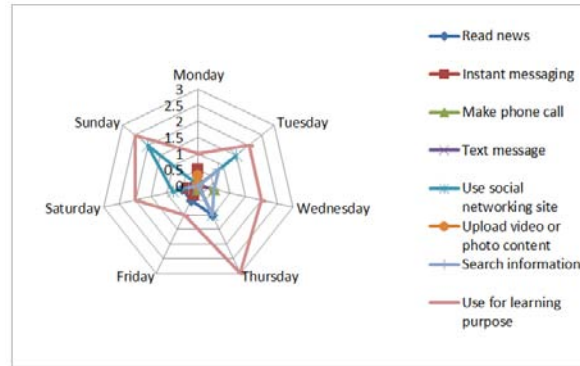
Figure 6: Usage pattern and level of usage by participant F

From the observation, it has been found that Participant F used her mobile devices to perform her learning consistently. She spent an average of two hours in using mobile devices to perform the learning activities. Although Participant F still uses the mobile devices to perform other non-learning tasks, however, she spent spends more hours in learning related tasks. Participant F subscribes to the Korean language learning apps and English idioms apps which will remind her to learn a new vocabulary every day. This has been shown that participant F is an active learner using mobile devices. She followed the "Let's taking English" through a mobile application, and subscribed to daily idioms and vocabulary in order to receive a new words for her to learn every day. This has shown that participant F is a disciplinary and independent learner. Besides, she also downloaded the apps in her smartphone such as "Korean pronunciation", "English Digest", "Radio BBC" and some games related to learning.

Participant F claimed that using mobile devices to perform learning activities are very convenient. It meets her learning expectation and it is fun for her to perform learning using her mobile devices. However, she felt that the learning process can be easily distracted by other features from the mobile devices such as social networking sites. She was unable to concentrate on her learning unless she has strong determination of turning off the chat in the Facebook. Besides, she is quite annoyed when the internet speed is low and she found difficulty to perform the activities smoothly.

Summary of Findings

Figure 7 shows the summary of the usage pattern among the participant using mobile devices. At first, male participants used the mobile devices to perform learning were mainly due to their curiosity or influenced by their friends. However, for female participants, they used mobile devices in performing learning were due to their self-interest. As the age increase, self-exploration and motivation have become another factor that stimulates them to use the mobile devices to perform the learning. Participant B and C learned about the science facts and performing school project using mobile devices. Participant C and D used their mobile devices in performed different tasks. They were the pair who fully utilized the functions and features of their mobile devices. Participants A and E claimed that they learned from the games in their mobile devices. Participant C and E obtained news and information from the social networking site. The information and news were about the sports. Participant B and D used mobile devices to read and write a novel. Participant B read and wrote about the English novel whereas participant D read and wrote about Chinese novel. Both of them perceived that their language skills and writing skills have significant improvement. Participant D and E were the ubiquitous learner using the mobile devices. Participant D used her mobile devices to learn the skill of drawing and broadcasting whereas participant E used the mobile device to learn English vocabulary.

Figure 7: Interrelation of activities performed among the participants
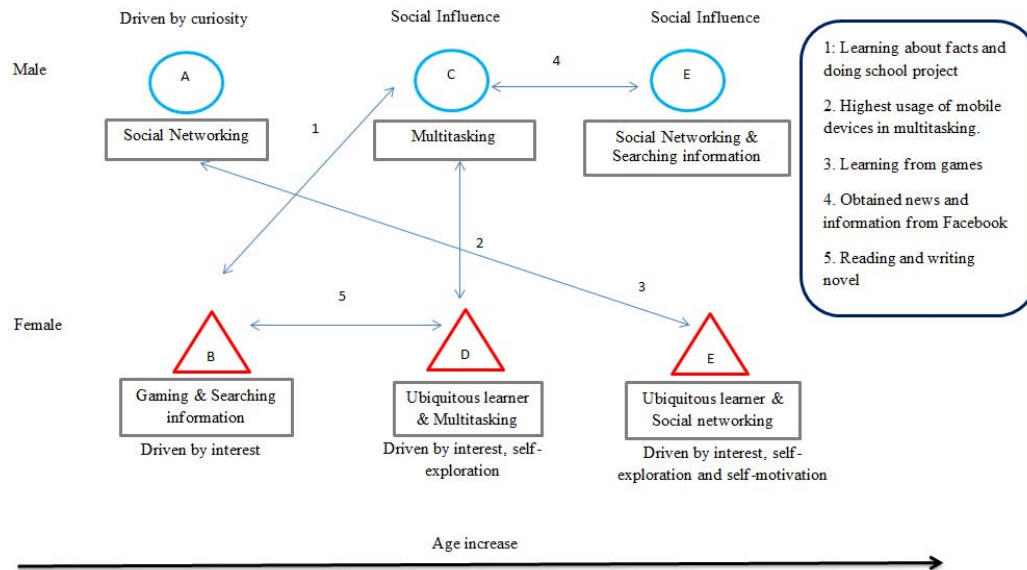
Highlights

Total hour spent on the week in using mobile devices for a male teenager is relatively high among the participants. Most of his time spent on using Facebook or instant messenger to chat with his friends in groups. The content of the discussion is regarding to the daily activities performed in school. Besides, it has been observed that the trends have shifted from paid service especially using Short Message Service (SMS) to free downloaded apps. Participants preferred to use the free apps such as *Facebook* chat room, *whatapps* and *wechat* to chat with their friends. Making phone call using line service is only served for emergency purpose.

Using the laptop to read text is still preferable by teenagers instead of using the smartphones due to the screen size of the devices. Four participants agreed that the screen size of the laptop created a better reading experience for them compared to using the smartphone. On the other hand, two participants have the same viewpoint where using mobile devices reduce their concentration in learning. This is because the accessibility of social networking site downloaded games will distract them from learning.

All the male participants preferred teachers in schools compared to the use of mobile device in formal learning. Two of the male participants posited that learning through "face to face" interaction is better than using the mobile devices to learn. However, one female participant stated that not all school subjects can be learned using mobile devices. In the meanwhile, all participants agreed that learning by using mobile devices based on their interest is workable.

DISCUSSIONS
The perception of the participants
The majority of the participants still perceived and used the mobile devices as communication tools, gaming tools except for two participants who have started to integrate mobile devices into ubiquitous learning for more than 3 years.

Participant A claimed that the majority of his knowledge is learned from the school and had little ubiquitous learning experience using mobile devices but then the enthusiasm to learn only maintain for a few weeks. He perceived that he could not learn from the mobile devices by explaining that "*Face to face interaction with teachers is still important…..Teacher is there for you to explain and clarify your doubt. But for mobile devices, if you have any question, we cannot ask, they just 'show' you. Even though you can ask question, the response to your questions is not as fast as you ask directly from the teacher. If too many question posted, I don't think they (the online host) will response to you one by one. I think I will still prefer the instantaneous response and learn through face to face from the teacher.*" This has shown that Participant A did not convinced by the use of the mobile devices to perform the learning.

Participant B pointed out that she can learn by using mobile devices based on her interest but she did not prefer to learn the school subjects by using mobile devices. She is more preferred on using books. This is because she

claimed that, the information obtained online may not be as detailed as in the books. However, for the learning based on her interest, she is more preferred to use mobile devices to learn. Mobile devices are used to support informal learning based on the participant's preference and interest.

Participant C perceived that the mobile devices can be used for multitasking and the response of obtaining information is very fast compared to using other resources such as looking for books in the library or waiting the feedback from the teacher.

Participant D claimed that she can learn almost everything by using mobile devices. "*I read novel... it improved in my writing skills... I practice my intellectual by playing chess and games on the Facebook.... I used to watch YouTube video... to learn the skills such as drawing and playing guitar....I learned pronunciation and broadcasting skills from YYyuyin....I used to listen to the song when waiting for bus*." Through the informal learning by using the mobile devices, Participant D learned the skills and some other knowledge that she claimed that they could not be learned from the schools. However, these skills are one of the workforce demand skills. Thus, Participant D has prepared herself with those skills eventhough she is still in the secondary school. It shows that some teenagers are well-prepared with the work force demand skills when they are still schooling since the skills and information can be obtained easily as long as they possess the technology devices.

Participant E showed not much interest in using mobile devices to learn because he thought that learning is the activity which required human interaction. He is more preferred face-to-face learning rather than using mobile devices. Other than this reason, he pointed out that the screen size of his mobile device (smartphone) is small and it makes him difficult to view the text on the screen for a long period of time.

Participant F said that "*I did not feel any difficulties in using mobile devices to perform learning... Mobile devices have made good use of my free time*." From the past learning experience, participant F perceived that mobile devices bring a lot of conveniences for her in terms of speed, time and its usability.

In short, participant's perceptions on the use of mobile device are the key factor that influences their decision in making use of the mobile devices to perform various types of activities. Besides, it can be found that some workforce demand skills such as languages, speaking skills and other technical skills has been learned and practiced by some of the participants through the ubiquitous learning.

The experience of the participants
All the participants spent most of their time using their mobile devices at home as their house has the internet service. However, it doesn't seem to be any problem for them to use mobile devices in performing the ubiquitous learning at home. The majority of the participants felt that using mobile devices to perform ubiquitous learning is comfortable and convenience. There was only one participant had negative experiences when using mobile devices to perform the learning. It has been found that, in the past, the participant A failed to look for a solution to his doubts regarding the computer knowledge and it has become a deterring factor for him from using mobile devices in performing learning. He claimed that sometimes he was unable to obtain answers or solution to his questions or doubts of his problems. He sometimes will suspect the validity and accuracy of the source of information. For the rest of the participants, they all have a positive learning experience by using mobile devices. They affirmed that they will use mobile devices to perform learning in the future.

Moreover, all participants have the experience of using mobile devices to learn new vocabulary or language. Some of them downloaded the dictionary apps whereas some use Google translate to look for the definition and pronunciation of the new words. From the findings of Chen (2013), it is also shown that mobile devices are an ideal language learning tools.

The attitude of the participants
Although the usage level and purpose vary among participants in using mobile devices, all of the participants possess a positive attitude towards using mobile devices in performing learning. The finding is correspond with the study done by Chen (2013) where teenagers have a positive attitude towards the usability, effectiveness and satisfaction of mobile devices because they are the generation that has grown up using these technologies. Besides, the speed of obtaining the knowledge and information is fast and the content of the knowledge is easily access to. These are the main concerns for the teenagers. For participant A, to his level of age, mobile devices did not play very important role in his learning but he still possesses a positive attitude in using mobile devices in learning in the future. Participant E perceived the usefulness of mobile devices as convenient and can bring them to anywhere as it makes learning happened regardless of time and place constraint as information can be obtained at any time.All participants claimed that they will feel uncomfortable when the mobile devices are not

with them for a long period of time. This has shown that mobile devices have become one of the important things in their daily life.

CONCLUSIONS

From the observation of this research, the participants had little experience of using mobile devices in performing learning. It has been found that using mobile devices to perform ubiquitous learning is much dependent on individuals. Learning is much depending on the individual's preference, interest and self-motivation. Participants perceived that ubiquitous learning is more towards informal learning, which is much depend on the participant's interest. From the findings, it has been shown that female participants are more active in using mobile devices in performing learning based on their interest compared to male participants. Male participant is more depend on teacher or instructor in performing learning. On the other hand, female participants are much independent when the learning tasks are related to their interest.

Besides, mobile devices do not only support informal learning especially learning based on individual's interest but they are also used to support formal learning such as performing school project and finding extra information about the subject in order to get more clarification in the study. Teenagers can look for other alternatives as the source of information. However, the disadvantages of using mobile devices were the screen size of the mobile devices is small and the learners are easily distracted by the features embedded in the mobile devices especially games and social network site. The learners are unable to concentrate on their learning tasks.

The initial method used by teenagers to learn is to look for information from the YouTube, Wikipedia and Google search. Teenagers preferred to use any of these three websites to obtain the knowledge of information after that they only proceed further with the learning. Moreover, it has been found that, learning fact, language and skills using mobile devices are the most preferred activities by the teenagers. By learning through mobile devices based on teenagers' interest, it increases the interest of learning among the teenagers.

The result of this study suggested that self-interest, determination, motivation are the key factors that make the ubiquitous learning successful. Learner' passionate and determination will help them overcome all the difficulties encountered during their learning process using mobile devices. It is easier for an active learner to perform ubiquitous learning due to their passionate and determination. Passive learner needs more positive learning experience to encourage and convince them in performing the learning using their mobile devices.

RECOMMENDATIONS

The design of the mobile devices especially the screen size will be one of the factors that need to take into consideration when designing the learning material. Besides, the easiness of obtaining the content of knowledge must also take into consideration as the teenagers are concern about the speed and the simplicity. The teenagers may not want to explore further if the knowledge of content is complicated and hard to obtain. As suggested by Al-Fahad (2009), people can learn more effectively if the information is broken down into simple and easy to comprehend form. Besides, by embedding the knowledge of content into the games, it may increase the interest of the teenagers to learn. In addition, the knowledge content must be simple and shorter rather than complicated and lengthy. Besides, it will add value to the learning experience if the content is easily accessed and shared. On the other hand, since teenagers can easily get an access into the open resources and content, the validation of the data and information should have a scalable evaluation before they publish online.

Research in the area of integrating mobile devices into ubiquitous learning is relatively new. More research is needed in the future in order to obtain deeper understanding in the field of ubiquitous learning. A continuation of this research using different community could add more details and create new inputs to the study. Besides, research could also focus on examining the factors of integrating the mobile devices into ubiquitous learning by the teenagers or to study the behavior change of the teenagers after using mobile learning.

ACKNOWLEDGEMENTS

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APPENDIX: Daily Activities Checklist

Name:
Date:
1. For what purpose and for how long you use your mobile device(s) today? o I used my mobile device(s) to read e-books for _____ minutes/hour(s) o I used my mobile device(s) to read news for _____ minutes/hour(s) o I used my mobile device(s) to play games for _____ minutes/hour(s) o I used my mobile device(s) to watch movie for _____ minutes/hour(s) o I used my mobile device(s) to listen to music for _____ minutes/hour(s) o I used my mobile device(s) to chat/ instant message for _____ minutes/hour(s) o I used my mobile device(s) to make phone call for _____ minutes/hour(s) o I used my mobile device(s) to text the message for _____ minutes/hour(s) o I used my mobile device(s) to log in the social networking site for _____ minutes/hour(s) o I used my mobile device(s) to upload video or photo content for _____ minutes/hour(s) o I used my mobile device(s) to maintain my own blog/website for _____ minutes/hour(s) o I used my mobile device(s) to search information for _____ minutes/hour(s) o I used my mobile device(s) to download learning material for _____ minutes/hour(s) o I used my mobile device(s) to _____ for _____ minutes/hour(s)
2. Did you perform learning-related task(s) using mobile device(s) today? Yes, I used for _____ hour(s)   □ No I have use my mobile devices to learn_____ _____ _____ _____ _____ _____ _____

PKM TOOLS FOR ACADEMIA: INGREDIENTS FOR SUCCESS IN THE GLOBAL KNOWLEDGE SOCIETY

Ammar H. Safar, Ph.D.
Department of Curriculum and Teaching Methods, College of Education, Kuwait University, The State of Kuwait
dr.ammar@ku.edu.kw

Fahad A. Alkhezzi, Ph.D.
Department of Curriculum and Teaching Methods, College of Education, Kuwait University, The State of Kuwait
dr.alkhezzi@ku.edu.kw

ABSTRACT

This study aimed to assess the reaction-based satisfaction level of Kuwait University's students regarding the utilization of some PKM tools in their academic studies and its influence on managing their knowledge. A total of 100 undergraduate students from the College of Education participated in this research. Regardless of students being not aware at all about KM, PKM, and PKM tools. Yet, the fact is that the results showed a significantly positive, affirmative, and encouraging feelings, attitudes, and perceptions with respect to using PKM tools for academia and personal life as well (i.e., yielded an agreement ratio about 95 percent). The majority of the participants did consider PKM tools as being appropriate and useful to their work/study. They also did believe that PKM tools are important constituents for success in the global knowledge society. Thus, most of the participants were highly satisfied with PKM tools and, accordingly, their reaction-based satisfaction level was positive and significantly high among all subgroups.
Keywords: Knowledge Management, Personal Knowledge Management, Knowledge Management Tools, Personal Knowledge Management Tools, Education

INTRODUCTION

Knowledge, innovations, and advancements in information and communication technologies (ICT) have always played a remarkable role in the development and transformation of society we live in throughout history, from agrarian to industrial and now to a knowledge driven society which entails the acquisition, usage, and sharing of knowledge, skills, attitudes, competencies, proficiencies, practices, and experiences (Al-Hawamdeh, 2004). The wave of innovations and advances in ICT is affecting and touching all sectors of life such as engineering, science, technology, entertainment, economic, political, social, education, health, and cultural (Rooney, Hearn, & Kastelle, 2012; Rooney, Hearn, & Ninan, 2008).

ICT tools will continue to change the nature of knowledge capture, creation, storing, classification, publication, and sharing. Organizations (e.g., corporations, enterprises, institutions, research laboratories, and other entities as well as individuals) that tend to disregard and/or diminish the significant role of ICT tools in the conduct of knowledge management (KM) may possibly lose the opportunity of success in this global knowledge society where the true competence for a knowledge worker is the capability to be able to stay connected and belong to virtual online communities where knowledge is and can be constantly disseminated and shared (Jennex, 2007; Rikowski, 2007; Handzic & Zhou, 2005).

Personal knowledge management (PKM) is the core of KM. Individuals (i.e., knowledge workers) may utilize processes, methods, strategies, practices, and tools in order to capture, develop, save, organize, disseminate, communicate, collaborate, and share their knowledge (i.e., their PKMs) with other individuals within a contextual framework (i.e., an organization). However, for KM to be fully implemented, other KM enablers within an organization also play a remarkable role in the completion of any KM initiative. Since KM is a socio-technological phenomenon, therefore, the other KM enablers include: (1) the organizational environment such as the organizational culture, the organizational structure, leadership, measurement, as well as incentives and rewards; and (2) the technological infrastructure which includes a wide range of ICT tools for organizational as well as personal uses (Handzic & Zhou, 2005).

Individuals are ever more in need to be responsible for their own growth and learning. They need information, skills, competencies, processes, methods, strategies, practices, and tools by which they can use to assess what they know in a given circumstances and then look further for means to fill out the gaps in their knowledge. Although an individual can be excellent practitioner at KM without using specialized ICT tools. However, these processes, strategies, and methods often entail the use of information and communication technologies (Jennex, 2007; Rikowski, 2007; Handzic & Zhou, 2005).

Therefore, introducing and utilizing PKM tools and enablers effectively and efficiently in PK-12 schools and higher education institutions as well as in organizations and entities worldwide seems to be relevant in order to achieve success and to help keep their knowledge workers' (i.e., students/learners, employees, and individuals) skills and competencies abreast.

OBJECTIVES OF THE STUDY

The use of PKM tools has a significant influence on organizations' success, effectiveness, and efficiency. The impact of these tools is touching the organizations' infrastructures as well as their personnel. The State of Kuwait, since the beginning of the twenty-first century, is among these nations embracing and nourishing the integration of ICT in Kuwait's public and private sectors. With the upcoming deployment of ICT initiatives in PK-12 schools and higher education institutions, including Kuwait University (KU), across the State of Kuwait, the need for tools and ideas on using and integrating the technology effectively and efficiently is paramount. Therefore, introducing and utilizing PKM tools in Kuwait's educational system is a necessity if we need to prepare the knowledge workers successfully for living in this global knowledge society.

This study aimed to examine/assess the reaction of KU's students regarding the utilization of some PKM tools in their academic studies and its influence on managing their knowledge. Students' feelings, perceptions, and attitudes were measured in order to achieve this objective. To that end the following questions were tackled:
1. Are KU's students aware about KM, PKM, and PKM tools?
2. Do KU's students use any type of PKM tools?
3. Do KU's students believe that PKM tools are useful ingredients for success in the global knowledge society?
4. Are KU's students satisfied with PKM tools?
5. How KU's students feel about their experience with PKM tools?

ASSUMPTIONS AND LIMITATIONS OF THE STUDY

The study assumed that KU's students reaction-based satisfaction level was highly positive regarding the utilization of PKM tools in their academic studies. Thus, the research foresaw that the students' feelings, perceptions, motivations, and attitudes toward PKM tools would prominently be positive, affirmative, and encouraging. The study covered the use of PKM tools in academic activities of the students enrolled only in a course entitled 'Computing in Education 0840-235'. Other areas of applications were excluded. A sample of 100 female senior undergraduate students in the College of Education (COE) at KU were scrutinized and surveyed for this research due to the nature of the academic course of study that limits the number of students enrolled in each section to 20-25 students in senior classes.

SIGNIFICANCE OF THE STUDY

Although many research studies undertaken over the past two decades have examined and clearly defined the efficiencies and effectiveness of ICT tools/programs, in general, and PKM tools/initiatives, in particular, on organizations' efficacy, productivity, financial capital, intellectual capital/asset, and success. However, through the course of searching, retrieving, and reviewing literature for this study, the researchers found no evidence of such studies—focusing essentially on the impact of PKM tools—in the Arab Gulf Cooperation Council (AGCC).

And, since the State of Kuwait is undertaking a widespread national reform plan in order to become an internationally renowned financial and economic center in the region. As a result, the Government is embracing, endorsing, and sustaining many initiatives toward achieving such vision in numerous organizations in the country covering both the public and private sectors. One such initiative entails the integration of ICT in Kuwaiti organizations in order to thrive the path in becoming a successful e-government practitioner as well as preparing e-citizens whom are ready to live in the global knowledge society.

Therefore, introducing the knowledge workers of Kuwait with KM and PKM literacy is a necessity to its future. Specifically, these knowledge workers need to be familiar with PKM tools, processes, methods, strategies, and

practices. This study introduced KU's students with such required literacy and it also provided them with the opportunity to use and integrate some PKM tools in their academic studies and personal lives as well.

This research provided valuable contribution regarding the reaction-based satisfaction level of KU's students with respect to PKM tools usefulness, effectiveness, and efficiencies. The results of this study delineated if there is sufficient demand for introducing and using PKM tools for academic studies at KU, specifically, and other higher education institutions, generally, as well as in Kuwait's PK-12 education. The findings provided a profile and reference for policy and decision makers as well as professionals regarding the integration of PKM tools in Kuwait's organizations. Hence, the research presented, somewhat, the top-management rank executives with empirical evidences that either support or contest the application and integration of PKM tools on a national level in Kuwait's organizations.

LITERATURE REVIEW
The following literature tackles the definition of PKM tools and its impact on organizations' success. It also includes pertinent information that covers typology of relevant ICT tools for managing individual's knowledge.

Grundspenkis (2007) and Wright (2005) simply defined PKM tools as a collection of processes, strategies, methods, activities, practices, services, and technologies that an individual carries out, with the objective to identify, create, gather, classify, organize, store, search, retrieve, and share knowledge in his/her daily activities and how these processes support work activities. In addition, Higgison (2004) elaborated further on this definition of PKM tools to assert that PKM technologies revolve around a set of core issues: (1) Managing and supporting personal and/or organizational knowledge and information so that it is accessible, meaningful, and valuable to the individual and/or organization; (2) Maintaining networks, contacts, and communities; (3) Making life easier and more enjoyable; and (4) Exploiting personal and/or organizational capital.

Scholarly research studies over the past two decades have undoubtedly proven that the usage and integration of KM/PKM tools, processes, methods, practices, and strategies into organizations' have played a positively significant and meaningful role on organizations' effectiveness, efficacy/efficiency, productivity, innovation, intellectual asset, financial capital, organizational learning, competitiveness, and success (Land, Land, & Handzic, 2002). Stated differently, KM/PKM tools enhanced decision making; improved collaboration and communication; increased profits and market share/size as well as share price; augmented employees' skills; reduced costs; enriched productivity and creativity; inspired critical and analytical thinking; increased innovation; heightened learning/adaptation capability; improved business processes; elicited new or better ways of working; stimulated entry to different market type or created additional business opportunities; enabled better product or service quality; escalated employees' empowerment; facilitated sharing best practices; provoked return on investment (ROI) of KM efforts; boosted intellectual capital (IC); fostered the formation of more value to customers; empowered better staff attraction/retention; allowed quicker response to key business issues; facilitated better customer handling; and improved new products development lines (Dalkir, 2011; Jennex, 2007; Kok, 2007; Maier, 2004; Ofek & Sarvary, 2001; Elliott & O'Dell, 1999; Van Buren, 1999; Wiig, 1999; Ruggles, 1998; Allee, 1997).

Typologies of KM/PKM technologies can help better understand the potential significant roles that ICT tools may have/play in KM/PKM. There are several classifications of ICT tools for KM/PKM. However, Handzic and Zhou (2005) presented a comprehensive typology of relevant ICT tools for KM/PKM that combined from the work of Alavi and Leidner (2001), Grover and Davenport (2001), and Davis (1998). This typology is based on the characteristics of KM processes as well as their usage purposes. In this typology, ICT tools that support KM/PKM can easily be classified into one of seven categories.

The first category in this typology is 'knowledge storage' technologies. These tools are used in order to capture and store organizational knowledge to improve organizational memory as well as to supply widespread access to knowledge resources. Examples include: knowledge repositories, databases, data marts, and data warehouses.

The typology's second category is 'knowledge access' technologies that can be employed in the knowledge storage process of KM too, but with the purpose of enhancing access to knowledge saved in 'knowledge storage' tools and/or supporting the transformation of knowledge amongst individuals. Some examples are: knowledge maps, knowledge directories, and electronic yellow pages.

'knowledge search/retrieval' technologies is the third category in this typology. It includes ICT tools used in the knowledge search/retrieval process of KM, with the intention of locating internal knowledge on the

intranets/extranets and/or external knowledge on the Internet as well as enhancing access to knowledge resources by escalating the rapidity and accuracy of knowledge search/retrieval. Search engines, both PC-based and Web-based, and intelligent agents are obvious examples.

The fourth is 'knowledge delivery/sharing' technologies. These are ICT tools that can be adopted in the knowledge transfer process of KM to disseminate knowledge to places where it is needed and can be exploited. Some examples are: e-mail systems, voice mail systems, instant messaging systems, electronic bulletin board systems, whiteboards, videoconferencing, online discussions groups/forums, groupware, and social networking services tools/technologies such as social networking sites, social bookmarking sites, blogs, vlogs, klogs, content sharing sites, rss/feed aggregators, and wikis.

The typology's fifth component is 'knowledge discovery and visualization' technologies. The ICT tools included in this category can be utilized in the knowledge creation process of KM to explore, examine, and analyze raw data in order to identify, recognize, and discover hidden patterns and relationships as well as to extract new knowledge. Examples include: data and text mining tools, statistical tools, personal thinking/visualization tools (e.g., concept/mind maps), simulations, and desktop productivity tools (e.g., word processors, spreadsheets, presentations, databases, HTML editors, graphics editors, desktop publishing tools, digital video/audio production tools, multimedia authoring technologies, animation tools, and e-mail clients).

The sixth category in this typology is 'knowledge utilization' technologies, a category that can be deployed in the knowledge application process of KM. These tools have the ability to implant knowledge into work processes, with the objective of assisting and easing knowledge integration and application. KM systems, expert systems, workflow systems, decision support systems, decision trees, and rule inductions are some examples.

The typology's seventh category is 'platform' technologies. The ICT tools that best fit this category are Net-based. These tools can be utilized conjointly with other technologies in any KM process in order to supply a network-based platform for knowledge collection, communication, and analysis. The tools can be applied to facilitate and support all KM processes and for multiple purposes. Entities and organizations around the globe frequently use these networked technologies in order to develop and create a single point of access to multiple sources of knowledge. Examples of such commonly used networked tools are: Internet, intranets, extranets, and portals.

The seven types of KM/PKM technologies presented are not commonly exclusive of each other; however, they are inclusive in nature. Each category is interconnected and interrelated with one another. Some ICT tools may be utilized to sustain several KM processes and as a result it may have multiple objectives. Also, KM/PKM tools are frequently joined/merged in order to construct/generate a mutual effect. Additionally, there may possibly be circumstances in which a technological tool does not fit efficiently into this typology/framework of KM/PKM technologies/tools.

Other dimensions are involved in describing KM/PKM technologies. For example, Rollet (2003) provides a typology/classification of KM/PKM tools according to the following structure: (1) communication; (2) collaboration; (3) content creation; (4) content management; (5) adaptation; (6) e-learning; (7) personal tools; (8) artificial intelligence; and (9) networking. These categories can also be sorted based on the specific phase of the KM cycle in which they are used (i.e., knowledge generation, knowledge codification, and knowledge transfer) (Ruggles, 1997).

It should be noted that KM/PKM technologies consist of either software, or hardware, or a combination of both. KM/PKM systems are either PC-based or network-based, and often, the network-based KM/PKM tools are Web 2.0 technologies that allow users to generate content easily and efficiently (i.e., Web syndication technologies). Some of the KM/PKM tools are free of charge while others are fee-based.

Conclusively, KM tools, in general, and PKM tools, in particular, have the capability to enrich teaching, learning, and training outcomes in the academia as well as to empower individuals' knowledge including their information, capabilities, skills, proficiencies, and experiences. The application of PKM tools within organizations (e.g., academia such as PK-12 schools, colleges, universities, and institutions) have the ability to build a solid foundation for promoting a profound lifelong learning for learners of all ages and across all fields and disciplines. Consequently, PKM tools would assist in preparing knowledge workers (i.e., students, employees, and people) and providing them with the twenty-first century knowledge and skills which would

help nations, globally, to easily transform into knowledge-based communities and seamlessly join and thrive the global knowledge society.

METHODOLOGY
Research design
A descriptive scanning research model was used in this study. Indeed, the first level (i.e., reaction) of Kirkpatrick's classic 4-level evaluation research model was utilized to measure and validate the reaction-based satisfaction level of students/learners utilizing and integrating PKM tools into education for the purpose of managing their own knowledge. This research design is a reference evaluation model. It facilitates assessment at four gradual levels: reaction, learning, transfer, and results. In 1996, Phillips included ROI as a fifth level (Kirkpatrick, 2006). Kirkpatrick's/Phillips' evaluation model assists scholars, academics, administrators, professionals, and policy makers to probe into survey data through a powerful lens close to the participants' experience, thus, providing better clarification and understanding of the reaction-based satisfaction level of the learners'/students' regarding the utilization and integration of PKM tools at KU.

The researchers incorporated the utilization of PKM tools into the instructional framework of an undergraduate two-hundred-level academic course designed for senior students enrolled only in the College of Education at KU. The end-of-course Likert scale surveys were used in this study as the core measurement indicator for the students' reaction level. Responses included strongly agree (5), agree (4), undetermined (3), disagree (2), and strongly disagree (1).

The questionnaire structured around 19 statements stated positively. The statements dealt with perceptions, feelings, beliefs, and attitudes regarding the use of PKM tools. The survey also encompassed a section on the participants' demographic information such as name, university grade level, major, grade point average (GPA), and type of ICT user.

The instrument was constructed after reviewing earlier studies. While developing the data collection instrument, a great deal of consideration was placed into the adequacy of the survey's items that measure the reaction-based satisfaction level as well as the relevancy of the independent/factor variables. The survey was then submitted to a panel of experts for review and pilot tested on selected students who were not part of the research sample. Other forms of measurement such as informal interviews and observations were also incorporated into the investigation to help verifying the satisfaction level of the participants.

Sample
KU provides rich ICT resources for students, faculty, and employees. It supports the integration of ICT into the organization in all areas including disciplinary, administration, and financial. KU is fulfilling its commitment to the national developmental plan for reforming the country toward becoming an active knowledge-based society.

A sample of 100 female senior undergraduate students from the COE at KU enrolled in four sections of an undergraduate-level course entitled 'Computing in Education 0840-235' for the Fall semester of 2011-2012 academic year were asked by the researchers to participate in this study. The sample represented various ethnic and academic backgrounds.

The academic course is a mandatory requirement for the professional preparation of all pre-service teachers in the COE. The course is a three-credit class taught the same subject content by the same instructor, Dr. Ammar Safar, using the same delivery method for instruction. The instructional model used combined face-to-face instruction with online curriculum distributed over the Web using a learning management system provided by KU.

Data collection
The researchers introduced KM and PKM to the participants at the beginning of the Fall semester of 2011-2012 academic year. Then, the instructor presented some of the classifications for categorizing KM/PKM technologies. Later on, the instructor elaborated in his presentation to include detailed information about PKM tools and its role in the global knowledge society, in general, and in the academic world, in particular. Several PKM tools were introduced to the participants during the course period, which was almost four-month in total typically, encompassing all the categories specified in the PKM tools typologies. Hence, the researchers set out the tone for facilitating PKM tools in the academia and then served as guides and mentors. The researchers embraced both roles and noticed participants' positive response to prompt and encouraging feedback.

At the end of the semester, the participants were asked to complete the end-of-course survey. They were demanded to respond to the questionnaire's statements truthfully and honestly based on their experience. They were guaranteed that their responses are highly confidential and will, only, be used for statistical analysis purposes. The data collection was exclusively conducted and administered by the researchers throughout the deployment period of the research.

In addition to the quantitative method (i.e., survey questionnaire) used for collecting the study's data. However, other qualitative modes of inquiry (i.e., informal interviews and observations) were also deployed in this process to insure the quality of the study's data analysis and to supply rich data sources which could serve several functions within the research. Responses to the interviews' questions and the observations' notifications were all recoded into a quantifiable format for data analysis objectives.

Methods of analysis
Several means of analysis were applied to examine the collected data. The descriptive analysis methods used were frequency, percentage, mean, and standard deviation. The inferential statistics techniques used were one-way analysis of variance (ANOVA), Dunnett's C multiple comparisons test, Scheffe's multiple comparisons test, and independent-samples t-test. These methods met the basic parametric assumptions required for their application. When performing inferential tests, an alpha level (significance level) of 0.05 was selected.

In order to measure and assess the students' feelings, perceptions, and attitudes as groups. Several comparisons among the research's questions and other relevant demographic independent/factor variables (e.g., section, GPA, type of ICT user, and major) were conducted. Precisely, a series of ANOVAs were deployed to test for differences between more than two groups. When statistically significant differences were discovered, post hoc techniques such as Dunnett's C and Scheffe's tests were implemented to verify which groups differed. Additionally, a series of t-tests were also utilized to investigate for differences between two groups. The comparisons elucidated how different learners felt toward the utilization of PKM tools for managing their knowledge—whether or not there were any demographic differences among the research groups. The findings of such tests can help policy and decision makers as well as administrative and instructional technology leaders and professionals delineate appropriate solutions to educational challenges.

The collected data were interpreted on the basis of objectives formulated. Each research question is presented, analyzed, and discussed separately and sequentially. The findings are presented in tables. Each table is labeled to indicate the type of data being analyzed.

Data analysis
Research question no. 1: Awareness
This question tackled the awareness of KU's students regarding KM, PKM, and PKM tools. Three items in the survey addressed RQ-1. All students strongly disagreed with these items. Thus, the results showed that all participants ($M = 1.0000$, and $SD = 0.00000$) were not aware about KM, PKM, and PKM tools. Inferential tests were not applied for RQ-1 because all responses were in the range of 'Strongly Disagree'—i.e., RQ-1 is a constant variable.

Research question no. 2: Utilization
This question was concerned whether or not KU's students utilize PKM tools for managing their knowledge. One item in the survey addressed RQ-2. Participants either strongly disagreed (i.e., 83.0 percent) or disagreed (i.e., 17.0 percent) with this item. Hence, the findings indicated that all participants ($M = 1.1700$, and $SD = 0.37753$) did not use any form of PKM tools for managing their knowledge. The results of the comparisons tests revealed no significant differences among the subgroups.

Table 1: Frequencies, percentages, means, and standard deviations of participants' responses to RQ-1, "awareness", and RQ-2, "utilization".

RQs		Statements	SD		D		U		A		SA		M	SD
			N	%	N	%	N	%	N	%	N	%		
RQ-1	01	I was aware about KM.	100	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1.00	0.000
	02	I was aware about PKM.	100	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1.00	0.000

			SD		D		U		A		SA			
	03	I was aware about PKM tools.	100	100.0	0	0.0	0	0.0	0	0.0	0	0.0	1.00	0.000
RQ-2	01	I used to utilize PKM tools for managing my knowledge.	83	83.0	17	17.0	0	0.0	0	0.0	0	0.0	1.17	0.378

Research question no. 3: Usefulness

This question focused on whether or not KU's students believe that PKM tools are pertinent and useful ingredients for success in the global knowledge society. Twelve items in the questionnaire represented RQ-3. The results revealed that the majority of the students (i.e., 95.0 percent, $M = 4.7150$, and $SD = 0.66204$) conceded that PKM tools are useful and valuable to them for academia, the job/work, as well as their personal lives. Accordingly, KU's students regarded PKM tools as being relevant and useful elements for thrive and success in the global knowledge society. The findings of the inferential tests disclosed no significant differences among the subgroups with respect to 'Section'. Nevertheless, participants' responses to RQ-3 showed significant differences among all subgroups with respect to 'Type of ICT User', 'GPA', and 'Major'. Those students categorized as 'Professional' ICT users ($M = 4.9844$, and $SD = 0.05370$), having 'Above Average' GPAs ($M = 4.9621$, and $SD = 0.07820$), and majoring in 'Sciences' ($M = 4.8857$, and $SD = 0.12473$) scored significantly greater mean values with respect to RQ-3 than the other subgroups.

Table 2: Frequencies, percentages, means, and standard deviations of participants' responses to RQ-3, "usefulness".

	Statements	SD		D		U		A		SA		M	SD
		N	%	N	%	N	%	N	%	N	%		
01	I consider PKM tools as being relevant to my study/work.	0	0.0	5	5.0	0	0.0	15	15.0	80	80.0	4.70	0.718
02	I believe that PKM tools provide learners with the 21st century knowledge, skills, and competencies.	0	0.0	5	5.0	0	0.0	13	13.0	82	82.0	4.72	0.712
03	I believe that PKM tools are useful instructional tools across all subject areas and grade levels.	0	0.0	5	5.0	0	0.0	18	18.0	77	77.0	4.67	0.726
04	I believe that PKM tools aid students' learning and help increasing students' achievement.	1	1.0	4	4.0	0	0.0	12	12.0	83	83.0	4.72	0.753
05	I believe that PKM tools help generating and enriching motivation, attitude, engagement, productivity, creativity, and innovation.	0	0.0	5	5.0	0	0.0	19	19.0	76	76.0	4.66	0.728
06	I believe that PKM tools assist learners in managing their knowledge.	0	0.0	5	5.0	0	0.0	13	13.0	82	82.0	4.72	0.712

07	I believe that PKM tools enhance critical/analytical thinking and visual learning capabilities.	0	0.0	5	5.0	0	0.0	20	20.0	75	75.0	4.65	0.730
08	I believe that PKM tools augment communication, collaboration, sharing, and presentation skills.	0	0.0	5	5.0	0	0.0	11	11.0	84	84.0	4.74	0.705
09	I believe that PKM tools are able to identify, create, gather, classify, organize, store, search, retrieve, and share knowledge.	0	0.0	5	5.0	0	0.0	13	13.0	82	82.0	4.72	0.712
10	I believe that PKM tools can increase the empowerment of learners.	0	0.0	5	5.0	0	0.0	10	10.0	85	85.0	4.75	0.702
11	I believe that PKM tools promote e-citizens and/or knowledge workers.	0	0.0	5	5.0	0	0.0	10	10.0	85	85.0	4.75	0.702
12	I believe that PKM tools construct a solid foundation for meaningful lifelong learning.	0	0.0	5	5.0	0	0.0	7	7.0	88	88.0	4.78	0.690

Research question no. 4: Satisfaction

This question concentrated on whether or not KU's students are satisfied with PKM tools. Three items in the survey emphasized on RQ-4. The findings evidently illustrated that most participants (i.e., 95 percent, $M =$ 4.8100, and $SD = 0.67212$) acknowledged that they are satisfied with PKM tools. Specifically, the majority of the students stated clearly that they are willing to use PKM tools for managing their knowledge and they will highly encourage other personnel to use PKM tools for the same purpose. Also, most participants asserted that they are gratified because they became acquainted about PKM tools. The results of the comparisons tests unveiled no significant differences among the subgroups with respect to 'Section'. But, participants' responses to RQ-4 displayed significant differences among all participants with regard to 'Type of ICT User', 'GPA', and 'Major'. The mean values for those classified as 'Professional' ($M = 5.0000$, and $SD = 0.00000$) and 'Acquainted' ($M = 4.9899$, and $SD = 0.05803$) ICT users were significantly higher than 'Novice' ($M = 4.4667$, and $SD = 1.06089$) ICT users. Also, the means of the responses for the participants who have been categorized as having 'Above Average' ($M = 5.0000$, and $SD = 0.00000$) and 'Average' ($M = 4.9810$, and $SD = 0.07850$) GPAs were significantly greater than those having 'Below Average' ($M = 4.4271$, and $SD = 1.10143$) GPAs. Additionally, the mean of the responses for the participants who have been majored in 'Sciences' ($M = 4.9905$, and $SD = 0.05634$) was significantly higher than those majored in 'Arts' ($M = 4.7128$, and $SD = 0.81836$).

Table 3: Frequencies, percentages, means, and standard deviations of participants' responses to RQ-4, "satisfaction".

Statements		SD		D		U		A		SA		*M*	*SD*
		N	*%*	*N*	*%*	*N*	*%*	*N*	*%*	*N*	*%*		
01	I will use PKM tools for managing my knowledge.	0	0.0	5	5.0	0	0.0	3	3.0	92	92.0	4.82	0.672
02	I will encourage other personnel to use PKM tools for managing their knowledge.	0	0.0	5	5.0	0	0.0	5	5.0	90	90.0	4.80	0.682
03	I am gratified that I became familiar about PKM tools.	0	0.0	5	5.0	0	0.0	4	4.0	91	91.0	4.81	0.677

Research question no. 5: Reaction

This question was related to the reaction-based satisfaction level of KU's students with regard to PKM tools usefulness, effectiveness, and efficiencies for academia. The question illustrated how KU's students feel about their experience with PKM tools. Fifteen items of the end-of-course survey focused on RQ-5 (i.e., RQ-3 consists of 12 items and RQ-4 comprises of three items). The results showed that the reaction-based satisfaction level for overwhelming number of students (i.e., 95 percent, $M = 4.7340$, $SD = 0.66238$) was significantly high with respect to their experience with PKM tools. Accordingly, the findings of this research delineated that there is sufficient demand for introducing and using PKM tools for academic studies at KU, specifically, and other higher education institutions, generally, as well as in Kuwait's PK-12 education. The findings of the inferential tests showed no significant differences among the subgroups with respect to 'Section'. Nonetheless, participants' responses to RQ-5 revealed significant differences among all participants with respect to 'Type of ICT User', 'GPA', and 'Major'. Those students categorized as 'Professional' ICT users ($M = 4.9875$, and $SD = 0.04296$), having 'Above Average' GPAs ($M = 4.9697$, and $SD = 0.06256$), and majoring in 'Sciences' ($M = 4.9067$, and $SD = 0.10504$) scored significantly greater mean values with respect to RQ-5 than the other subgroups.

Table 4.1: Analysis of variance of participants' responses to the research questions for type of ICT user differences.

		Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared ηp2
RQ-2: Utilization	Between Groups	.383	2	.192	1.354	.263	
	Within Groups	13.727	97	.142			.027
	Total	14.110	99				
RQ-3: Usefulness	Between Groups	8.189	2	4.094	11.282	.000	
	Within Groups	35.203	97	.363			.189
	Total	43.391	99				
RQ-4: Satisfaction	Between Groups	6.349	2	3.174	8.024	.001	
	Within Groups	38.374	97	.396			.142
	Total	44.723	99				
RQ-5: Reaction	Between Groups	7.773	2	3.887	10.571	.000	
	Within Groups	35.662	97	.368			.179
	Total	43.436	99				

Table 4.2: Post hoc multiple comparisons tests for type of ICT user differences.

Dependent Variable		(I) Type of ICT User	(J) Type of ICT User	Mean Difference (I-J)	Std. Error	Sig.
RQ-2: Utilization	Dunnett's C	1 Novice	2 Acquainted	-.12641	.08676	
			3 Professional	-.13304	.08842	
		2 Acquainted	1 Novice	.12641	.08676	
			3 Professional	-.00663	.10361	
		3 Professional	1 Novice	.13304	.08842	
			2 Acquainted	.00663	.10361	
RQ-3: Usefulness	Dunnett's C	1 Novice	2 Acquainted	-.53016*	.17196	
			3 Professional	-.65342*	.17062	
		2 Acquainted	1 Novice	.53016*	.17196	
			3 Professional	-.12326*	.02526	
		3 Professional	1 Novice	.65342*	.17062	
			2 Acquainted	.12326*	.02526	
RQ-4: Satisfaction	Dunnett's C	1 Novice	2 Acquainted	-.52323*	.17961	
			3 Professional	-.53333*	.17932	
		2 Acquainted	1 Novice	.52323*	.17961	
			3 Professional	-.01010	.01010	
		3 Professional	1 Novice	.53333*	.17932	
			2 Acquainted	.01010	.01010	
RQ-5: Reaction	Dunnett's C	1 Novice	2 Acquainted	-.52877*	.17310	
			3 Professional	-.62940*	.17211	
		2 Acquainted	1 Novice	.52877*	.17310	
			3 Professional	-.10063*	.02139	
		3 Professional	1 Novice	.62940*	.17211	
			2 Acquainted	.10063*	.02139	

*. The mean difference is significant at the 0.05 level.

Table 5.1: Analysis of variance of participants' responses to the research questions for GPA differences.

		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared ηp2
RQ-2: Utilization	Between Groups	.359	2	.180	1.267	.286	
	Within Groups	13.751	97	.142			.025
	Total	14.110	99				
RQ-3: Usefulness	Between Groups	8.677	2	4.339	12.123	.000	
	Within Groups	34.714	97	.358			.200
	Total	43.391	99				
RQ-4: Satisfaction	Between Groups	6.906	2	3.453	8.857	.000	
	Within Groups	37.817	97	.390			.154
	Total	44.723	99				
RQ-5: Reaction	Between Groups	8.295	2	4.148	11.449	.000	
	Within Groups	35.140	97	.362			.191

		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared ηp2
RQ-2: Utilization	Between Groups	.359	2	.180	1.267	.286	
	Within Groups	13.751	97	.142			.025
	Total	14.110	99				
RQ-3: Usefulness	Between Groups	8.677	2	4.339	12.123	.000	
	Within Groups	34.714	97	.358			.200
	Total	43.391	99				
RQ-4: Satisfaction	Between Groups	6.906	2	3.453	8.857	.000	
	Within Groups	37.817	97	.390			.154
	Total	44.723	99				
RQ-5: Reaction	Between Groups	8.295	2	4.148	11.449	.000	
	Within Groups	35.140	97	.362			.191
	Total	43.436	99				

Table 5.2: Post hoc multiple comparisons tests for GPA differences.

Dependent Variable		(I) GPA	(J) GPA	Mean Difference (I-J)	Std. Error	Sig.
RQ-2: Utilization	Dunnett's C	1 Below Average	2 Average	-.07768	.08318	
			3 Above Average	-.14867	.09209	
		2 Average	1 Below Average	.07768	.08318	
			3 Above Average	-.07100	.09958	
		3 Above Average	1 Below Average	.14867	.09209	
			2 Average	.07100	.09958	
RQ-3: Usefulness	Dunnett's C	1 Below Average	2 Average	-.58237*	.18619	
			3 Above Average	-.67306*	.18495	
		2 Average	1 Below Average	.58237*	.18619	
			3 Above Average	-.09069*	.02883	
		3 Above Average	1 Below Average	.67306*	.18495	
			2 Average	.09069*	.02883	
RQ-4: Satisfaction	Dunnett's C	1 Below Average	2 Average	-.55387*	.19516	
			3 Above Average	-.57292*	.19471	
		2 Average	1 Below Average	.55387*	.19516	
			3 Above Average	-.01905	.01327	
		3 Above Average	1 Below Average	.57292*	.19471	
			2 Average	.01905	.01327	
RQ-5: Reaction	Dunnett's C	1 Below Average	2 Average	-.57667*	.18762	
			3 Above Average	-.65303*	.18663	
		2 Average	1 Below Average	.57667*	.18762	
			3 Above Average	-.07636*	.02461	
		3 Above Average	1 Below Average	.65303*	.18663	
			2 Average	.07636*	.02461	

*. The mean difference is significant at the 0.05 level.

Table 6: Independent samples t-test of participants' responses to the research questions for major differences.

		Levene's Test for Equality of Variances		t-test for Equality of Means			Partial Eta Squared
		F	Sig.	*t*	*df*	Sig. (2-tailed)	ηp2
RQ-2: Utilization	Equal variances assumed	13.458	.000	1.653	98	.102	
	Equal variances not assumed			1.844	92.223	.068	.027
RQ-3: Usefulness	Equal variances assumed	11.752	.001	-1.918	98	.058	
	Equal variances not assumed			-2.579	69.598	.012	.036
RQ-4: Satisfaction	Equal variances assumed	17.651	.000	-2.000	98	.048	
	Equal variances not assumed			-2.723	65.122	.008	.039
RQ-5: Reaction	Equal variances assumed	12.866	.001	-1.939	98	.055	
	Equal variances not assumed			-2.620	67.985	.011	.037

DISCUSSION

This study exhibited empirical evidences on the reaction-based satisfaction level of KU's students concerning the utilization of some PKM tools in their academic studies and its influence on managing their knowledge. Regardless of students being not aware at all about KM, PKM, and PKM tools. Yet, the fact is that the results showed a significantly positive, affirmative, and encouraging attitudes and perceptions with respect to using PKM tools for academia and personal life as well (i.e., yielded an agreement ratio about 95 percent). The majority of the participants did consider PKM tools as being appropriate and useful to their work/study. They also did believe that PKM tools are important constituents for success in the global knowledge society. Thus, most of KU's students were highly satisfied with PKM tools and, accordingly, their reaction-based satisfaction level was positive and significantly high among all subgroups. These findings are consistent with the literature reviews provided in this paper as well as the assumptions postulated.

Furthermore, despite the fact that the results showed no significant differences among the subgroups with regard to 'Section'. However, the findings also revealed that there are significant differences among all constituencies with respect to 'Type of ICT User', 'GPA', and 'Major'. Those students categorized as 'Professional' ICT users, having 'Above Average' GPAs, and majoring in 'Sciences' scored significantly greater mean values with respect to RQ-3 (i.e., Usefulness), RQ-4 (i.e., Satisfaction), and RQ-5 (i.e., Reaction) than the other subgroups. These findings are also cohesive/consistent with many research studies conducted over the past decade.

The qualitative data—collected from the interviews' questions and the observations' notes—were very helpful in portraying a rich depiction of students' experiences with PKM tools. For example, the findings revealed that the majority of the students affirmed that they know how to use and integrate basic ICT tools such as word processing (i.e., Microsoft *Word*), presentations (i.e., Microsoft *PowerPoint*), collaboration (i.e., Web-based e-mail systems such as *Yahoo! Mail* and *Gmail*), and drill-and-practice applications. Yet, the students also affirmed that they are not familiar with using and integrating more advanced ICT tools. These include the

followings: electronic collaboration suites, simulations, animation tools, problem-solving applications, tutorial applications, spreadsheets, databases, multimedia, digital video/audio production tools, graphics editors, desktop publishing tools, concept/mind mapping and visual thinking/learning applications, and Web 2.0 technologies (e.g., wikis, blogs, vlogs, webinars, podcasts, discussion groups, forums, instant messaging, rss/feed aggregators, video streaming, online desktop productivity tools sites, content sharing sites, social bookmarking sites, and other forms of social networking media tools). Thus, these results also coincide with many research studies conducted in the past four years (Lei, 2009; Brush, Glazewski, & Hew, 2008).

Additional empirical evaluation studies are projected to be deployed on a wide scope of students from various KU's colleges. These research studies would be conducted using additional data collection tools and techniques in order to address the limitations of this study, which focused on the perceptions and attitudes of a small sample of participants.

CONCLUSIONS AND RECOMMENDATIONS

We need to prepare all learners to become knowledge workers who comprehend how today's ICT tools can help solve tomorrow's challenges. The revolutionary alterations and advances in ICT expanded our ability to resolve obstacles at a scale never before anticipated—using strategies, techniques, and methods that have not been available to us beforehand. Learners will need to take full advantage of these revolutionary alterations carried out by rapid advances in ICT. Learners will need to learn, understand, and practice new information, skills, and proficiencies. Learners will also need to utilize PKM technologies in order to be able to manage their knowledge. Understanding PKM tools and utilizing them efficiently and effectively is crucial to all learners as we work hard to: (1) nurture the level of academic achievement; (2) facilitate learners with the twenty-first century skills and information; (3) motivate and prepare learners for universal competitiveness; (4) mingle academics with real life; and (5) prepare learners for thrive and success in the global knowledge society. PKM tools can work prolifically across all disciplines and with all ages.

There is no doubt that ICT tools play a remarkable role in facilitating PKM. Some of the benefits of using PKM tools would be enhancing personal as well as organizational productivity, efficiency, creativity, innovation, critical thinking, visual learning, time management, task management, motivation, financial capital, intellectual asset, and success (Dalkir, 2011; Jennex, 2007; Kok, 2007; Maier, 2004; Land et al., 2002). PKM technologies can generate vigorous learning experiences. They have the ability to identify, create, gather/collect, classify, organize, store, search, retrieve, deliver/disseminate, and share knowledge in ways that benefit all types and ages of learners as well as encompassing a wide range of backgrounds and skill/competence levels (Bonk & Zhang, 2008). However, individuals ought to know and realize which PKM tools to use?; for what purposes?; how to efficiently and effectively use them?; when to use them?; where we can use them?; and who can use them? Once knowledge workers find answers for such relevant questions related to PKM tools, then, they will be able to achieve PKM's ultimate objectives in less time and efforts.

Additionally, the possibilities that PKM tools hold are endless because of the revolutionary and continuous advances and innovations in ICT. Yet, there is not a perfect PKM tool that can serve all my needs and achieve all of my goals. Each PKM technology has its own facets and it can be used in specific circumstances by particular individuals to achieve certain objectives. Therefore, knowledge workers are eagerly encouraged to utilize several PKM tools to sustain their needs and ultimately achieve their goals.

If the State of Kuwait, generally, and KU, specifically, are eager to be part of the global knowledge society and attain their desired educational and economic advantages, then, we should seek the following recommendations:
1. A well-planned and defined media awareness campaign focusing on KM/PKM and its related tools is a necessity on a large scale.
2. Attention to other KM enablers should also be accounted for when using PKM tools in Kuwaiti organizations such as the organizational environment which includes the following: (1) organizational culture; (2) organizational structure; (3) leadership; (4) measurement; (5) policy; and (6) incentive/reward systems.
3. There are specific skills and competencies associated with PKM that we need to be certain that our knowledge workers acquire and be acquainted with. Examples are: reflection, managing learning, managing knowledge, visual thinking, visual learning, individual learning, analytical thinking, information literacy, organization, categorization, researching, librarianship, searching and retrieving, assessment, communication, collaboration, presentation, creativity, innovation, productivity, problem solving, social networking, and security (Verma, 2009; Dorsey, 2001).

4. Providing KU's community members with training sessions on how to efficiently and effectively integrate PKM tools within the curricula/organization.
5. Higher education institutions should focus on KM/PKM and its relationship with IC so as to be one of the courses added to the general requirement curricula in the academia.
6. A great sense of security should be embraced by all members of the organization when using free PKM tools.
7. Each organization is highly encouraged to develop its own PKM tools because the IC of the organization needs to be secured and preserved.
8. Taking the following dimensions into consideration when assessing any PKM tool: instructional support, usability, interactivity, compatibility, and ROI.
9. More solid experimental and longitudinal studies are needed to be implemented in order to produce concrete measures of KM/PKM tools effectiveness and efficiencies on knowledge workers and organizations alike.

Finally, knowledge is something which only humans can possess. It is an asset and power. If you are a knowledgeable individual, then, you have status and you are in demand. ICT is not the core problematic issue when deploying a KM initiative/solution in any entity in the State of Kuwait since there is an adequate support available, from the Government, as far as ICT is concerned. The real issue is that we should focus on individuals' attitudes, because, in essence, individuals are the real gears that lead to a successful KM integration in any organization. Thus, addressing the issue of PKM and its related technologies in an organization is considered to be the most important KM enabler. Knowledge workers need to be aware that PKM tools are important for their personal productivity and also for their contributions toward organizational effectiveness. They need to be encouraged to start experimenting with whatever PKM tools are available to them. Additionally, measuring the effectiveness and efficiencies of KM/PKM tools in organizations' is vital, yet, a challenging issue since it requires to take into consideration both the users' and organizations' satisfaction. Hence, we certainly need to pay closer attention to these variables so as to succeed and thrive in our e-journey toward becoming a successful and interactive partner in the global knowledge society.

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STUDENTS, COMPUTERS AND MATHEMATICS THE GOLDEN TRILOGY IN THE TEACHING-LEARNING PROCESS

Arturo García-Santillán Ph.D. *(Corresponding author)*
Full time Researchers in the Administrative-Economic Research Center
Cristóbal Colón University, Campus Calasanz.
Highway Veracruz-Medellín w/n Col. Puente Moreno Boca del Río Veracruz, Mexico. Zip Code 91930 Email:
agarcias@ucc.mx

Milka Elena Escalera-Chávez Ph.D.
Full time Researcher, Multidisciplinary Unit Middle Zone at Autonomous University of San Luis Potosí, San Luis Potosí, México E-mail: milkaech@uaslp.mx

José Satsumi López-Morales Ph.D. *student*
Second year student in Doctoral Program in Management, Cristóbal Colón University
Veracruz, Mexico E-mail: jsatsumi@gmail.com

Arturo Córdova Rangel Ph.D.
Full time Researcher, Business Research Center at Universidad Politécnica de Aguascalientes,
Aguascalientes, México E-mail: arturo.cordova@upa.edu.mx

ABSTRACT

In this paper we examine the relationships between students' attitudes towards mathematics and technology, therefore, we take a Galbraith and Hines' scale (1998, 2000) about mathematics confidence, computer confidence, computer and mathematics interaction, mathematics motivation, computer motivation, and mathematics engagement. 164 questionnaires were applied to undergraduate students of several profiles: business and management, mecatronic engineering, industrial engineering, strategic system engineering and mechanic engineering all they in a study carried out at the *Universidad Politécnica de Aguascalientes*. The statistical procedure used was factorial analysis with an extracted principal component. The Hypothesis: Ho: $\rho=0$ has no correlation, while Ha: $\rho \neq 0$ does. Statistics test to prove: X^2, Bartlett test of sphericity, KMO (Kaiser-Meyer_Olkin) Significance level: $\alpha=0.05$; $p<0.05$ therefore reject *Ho* if $X^2_{calculated} > X^2_{tabulated}$. The results obtained from the sphericity test of Bartlett KMO (.859), $X^2_{calculated}$ 539.612 with 10 df $> X^2_{tabulated}$, Sig. $0.00 < p$ 0.01, MSA (MATH-CONFI .853; MATH-MOTI .884; MATH-ENGA .846; COMPU-CONFI .868 and INTE-MACO .848) provide evidence to reject *Ho*. Thus, the variables of Galbraith and Hines' scale help us to understand the student's attitude toward mathematics and technology.

Keywords: mathematics confidence, mathematics motivation, computer confidence, computer and mathematics interaction and mathematics engagement.

Mathematics subject Classification: 97U50

1. INTRODUCTION

At present the process of teaching and learning of mathematics has been modified by the information technologies through one of its instruments the computer. This has motivated the interest in knowing if through this tool, it overcomes deficiencies attitudinal and achieves a greater student learning. For this reason this paper focuses on the following questions: *¿what is the students' attitude toward the use of computers in the teaching of mathematics? What is the students' attitude toward mathematics confidence, motivation and engagement? How is this interaction between computer and mathematics achieved in the teaching process?* In order to answer these questions, the objective of this study was to measure, how mathematics confidence, mathematics motivation, computer confidence, computer motivation, computer-mathematics interaction and mathematics engagement help to understand the students' attitude toward mathematics and technology.

Besides the introduction, this document is composed of five sections: the first shows the theoretical approach that supports the research, the second shows some empirical studies, the third shows the hypotheses proposed in this study, the fourth shows the methodology used for research, the fifth describes the results obtained about the attitude towards learning students using this tool. Finally, we present the conclusions that were reached in this study.

2. THEORETICAL APPROACH TO MATHEMATICS CONFIDENCE, COMPUTER CONFIDENCE, ENGAGEMENT, MOTIVATION AND INTERACTION BETWEEN MATHEMATICS, COMPUTER AND STUDENTS

This research takes the construct proposed by Galbraith and Hines (1998, 2000) and Galbraith, Hines and Pemberton (1999) on the "mathematics-computer" and mathematics-computing attitude in mathematics confidence, computer confidence and computer-mathematics interaction. We take the construct proposed by Cretchley, Harman, Ellerton and Fogarty (2000) about attitudes towards the use of technology for learning mathematics.

The objective of this study is to determine the structure of the underlying latent variable that would allow us to understand the student's perception about mathematics and computers. Karadag and McDougall (2008) indicate that despite the theoretical and practical concerns in integrating technology into mathematics education, students widely use technology in their daily life at an increasing rate. Because these students were born in the information age, they are confident enough in using technology and have no idea about a life without technology, such as the internet and computer. There is no doubt that they can use technology effectively, and many studies document that they use technology as anticipated (Lagrange, 1999; Artigue, 2002; Izydorczak, 2003; Karadag and McDougall, 2008; Kieran, 2007; Kieran and Drijvers, 2006; Moreno-Armella and Santos-Trigo, 2004; Moyer, Niexgoda, and Stanley, 2005). Galbraith (2006) describes the use of "technology as an extension of oneself" as "the partnership between technology and student merge to a single identity" which is the highest intellectual way to use technology. This use of technology extends the user's mental thinking and cognitive abilities because technology acts as a part of the user's mind. For example, linked representation (Kaput, 1992) between symbolic and visual representation could be a relevant example for this type of use because manipulations in one of the representations affect the others.

Suurtamm and Graves (2007) state that, *"enabling easier communication, providing opportunities to investigate and explore mathematical concepts, and engaging learners with different representational systems which help them see mathematical ideas in different ways"*. They refer to the Ontario Ministry of Education which outlined the use of technology by suggesting: "students can use calculators and computers to extend their capacity to investigate and analyze mathematical concepts and to reduce the time they might need otherwise spent on purely mechanical activities," and added that technology is conceived as a tool to extend students' abilities with tasks which are challenging or impossible in paper-and-pencil environments. These tasks could be to perform complicated arithmetic operations.

The above discussion allows us to identify the variables implied in object of study, as illustrated in the following construct (path model) which describes the variables proposed by Galbraith and Hines (1998) about: maths confidence, maths motivation, maths engagement, computer confidence and the interaction among maths and computer, all this in the trilogy: student, computer and mathematics.
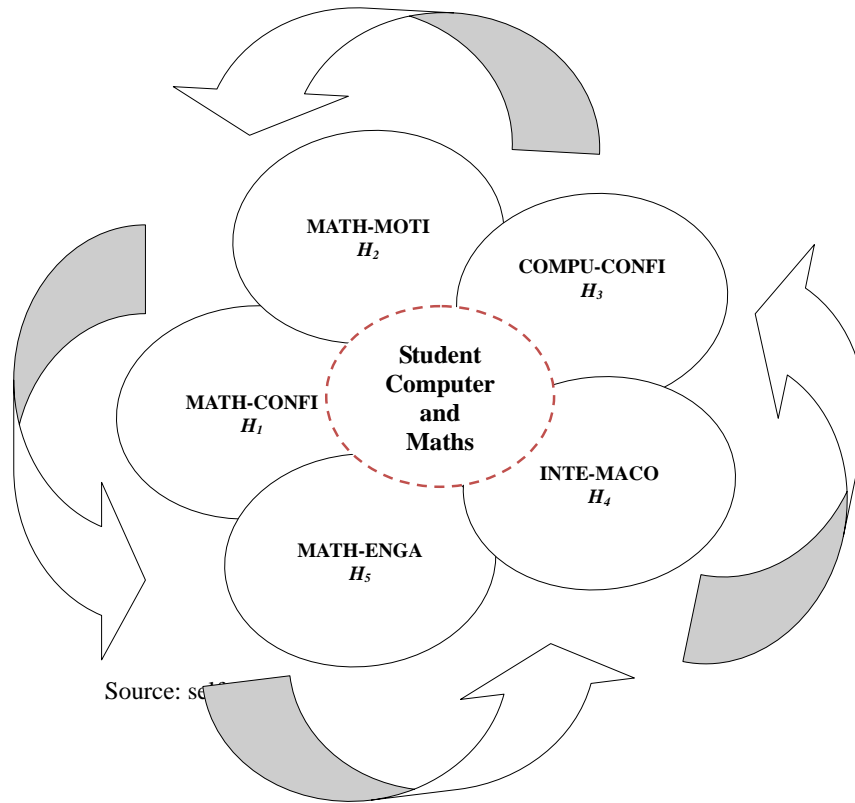
Figure 1 Theoretical Path Model

3. EMPIRICAL STUDIES

Some surveys on attitudes toward mathematics have been undertaken and have developed significantly in the past few years. The first ones focused on possible relationships between positive attitude and achievement (Leder, 1985), surveys highlighting several problems linked to measuring attitude (Kulm, 1980), a meta-analysis, and recent studies which question the very nature of attitude (Ruffell et al., 1998), or search for 'good' definitions (Di Martino and Zan, 2001, 2002), or explore observation instruments that are very different from those traditionally used, such as questionnaires (Hannula, 2002).

It is important to point out that the surveys on attitude towards mathematics have been undertaken for many years, but the studies related to attitude towards information technology has a shorter history in topics about mathematics education. The studies carried out within undergraduate programs in mathematics by Galbraith and Haines (2000) are important for this subject matter. In 1998, these authors developed instruments and several attitude scales to measure mathematics and I.T. attitudes. These instruments have been used to assess attitudes in different countries: England (e.g. Galbraith and Haines, 1998 and 2000), Australia (e. g. Cretchley and Galbraith, 2002), Venezuela (e.g. Camacho and Depool, 2002), Mexico (e.g. García-Santillán, Flores, Escalera, Chong and López, 2012; García-Santillán, Escalera and Córdova, 2012; García-Santillán, Escalera, Camarena, and García, 2012). The results offered us evidence about several of the dimensions of attitudes: 1) mathematics confidence, 2) mathematics motivation, 3) computer confidence, 4) computer and mathematics interaction and 5) mathematics engagement. In all these studies, the authors' findings have been similar: there is a weak relationship between mathematics and computer attitudes (both confidence and motivation) (Di and Zan, 2001) and that students' attitudes to using technology in the learning of mathematics correlate far more strongly with their computer attitudes than with their mathematics attitudes (Cretchley and Galbraith, 2002).

A study conducted by Fogarty, Cretchley, Harman, Ellerton, and Konki (2001), reports on the validation of a questionnaire designed to measure general mathematics confidence, general confidence with using technology, and attitudes towards the use of technology for mathematics learning. A questionnaire was administered to 164 students commencing a tertiary level course on linear algebra and calculus. Scales formed on the basis of factor analysis demonstrated high internal consistency reliability and divergent validity. A repeat analysis confirmed the earlier psychometric findings as well as establishing good test-retest reliability. The resulting instrument can be

used to measure attitudinal factors that mediate the effective use of technology in mathematics learning.

Gómez-Chacón and Haines, (2008) indicate that there are several studies describing the positive impact of technology on students' performance (Artigue, 2002; Noss, 2002). In particular, some researchers underline the new cognitive and affective demands on students in technology programs (Galbraith, 2006; Pierce and Stacey, 2004; Tofaridou, 2007). This evidence suggests that it is important to undertake research topics which make a careful study of the dialectic aspects of technical and conceptual work, and of the attitudes towards mathematics and technology in the setting where the learning of mathematics uses technology (graphing calculators, computer-based resources).

The results offered evidence about several dimensions of attitudes: mathematics confidence, mathematics motivation, mathematics engagement, computer confidence, computer motivation and mathematics-computer interaction. The authors of these studies come to a similar conclusion, that 'there is a weak relationship between mathematics and computer attitudes (both confidence and motivation) and that students' attitudes to using technology in the learning of mathematics correlate far more strongly with their computer attitudes than with their mathematics attitudes' (Cretchley and Galbraith, 2002).

On the other hand, studies by Goldenberg (2003), Moursund (2003), García and Edel (2008), García-Santillán, Escalera and Edel (2011), García-Santillán and Escalera (2011) report that at present the teaching-learning processes are favourably influenced in the evolution and growth of ICT, which contributes significantly to the educational process of mathematics in general. Regarding the use of technology to support the teaching process, Crespo (1997), cited in Poveda and Gamboa (2007), claimed that even though "buying and selling" the idea that technology is the magic formula that will transform classrooms into an authentic, perfect teaching and learning setting, in reality this is not true. However, Gomez Meza (2007), cited by Poveda and Gamboa, (2007), indicates that although technology is not the magic formula, nor probably the solution to all educational problems, it is true that technology could be an agent of change that favours the mathematics teaching-learning process. With these arguments, the hypothesis to be proved is:

3.1. Hypothesis
Considering that the correlation matrix is an identity matrix, Ho: $R_p=1$ the variables are not inter-correlated, Hi: $R_p \neq 1$ the variables are inter-correlated

Null Hypothesis H_O: There are no factors that contribute to understand the students' attitude towards mathematics and technology.

Alternative Hypothesis H_1: There are factors that contribute to understand the students' attitude towards mathematics and technology.

A particular way, the hypotheses are:
H1: Mathematics confidence is the factor that most explain the variance of model
H2: mathematics motivation is the factor that most explain the variance of model
H3: computer confidence is the factor that most explain the variance of model
H4: computer and mathematics interaction is the factor that most explain the variance of model
H5: mathematics engagement is the factor that most explain the variance of model

So, statistics hypothesis is: Ho: $\rho = 0$ does not have correlation   Ha: $\rho \neq 0$ has correlation. Statistical test to probe: $\chi2$, sphericity test of Bartlett, KMO (Kaiser-Meyer-Olkin), MSA (measure sample adequacy) and significance level: $\alpha =0.05$; $p< 0.01$, *p<0.05 load factorial of .70 Critical* values: $\chi^2_{calculated} > \chi^2_{tables}$, then reject Ho. Decision rule: Reject: Ho if χ^2 calculated $> \chi^2$ tables

4. METHODOLOGY
The Population was delimited to students majoring in: business and management, mecatronic engineering, industrial engineering, strategic system engineering and mechanic engineering who have studied the subject of financial mathematics at the *Universidad Politécnica de Aguascalientes* (UPA).

Table 1 Composition of the population studied (UPA)

Majoring	Frequency	Percentage
Business and Management	44	27
Mecatronic engineering	30	18
Industrial engineering	30	18
Strategic system engineering	30	18
Mechanic engineering	30	18
Total	164	100%

Source: Self-made

The type of sampling it is conventional. The sample obtained was of 164 students. We used the questionnaire of Galbraith and Haines (1998) which consists of 5 sections: confidence toward mathematics, mathematics motivation, engagement mathematics, the computer confidence, computer and mathematics interaction. Each section consists of 8 item measured on a Lickert scale, the range on this scale ranged from 1 (low) to 5 (very high). Therefore, in order to determine the reliability of instrument was used Cronbach alpha method. The result obtained was 0.904 (grouped variables) and 0.902 (separated variables). We can see that the reliability of instrument is more than 0.6, so we can say that the instrument applied provides the features of reliability and consistency (Hair, 1999).

5. RESULTS

The empirical research was supported by the statistical technique of factorial analysis for testing the factors that contribute to the students' attitudes towards mathematics and technology. Table 2 shows the correlation among variables, are all meaningful (>.5 sig. <0.01).

Table 2 Correlations Matrix

	Variables	COMPU-CONFI	MATH-MOTI	MATH-ENGA	INTE-MACO	MATH-CONFI
	COMPU-CONFI	1.000				
	MATH-MOTI	.624	1.000			
Correlation	MATH-ENGA	.734	.627	1.000		
	INTE-MACO	.749	.623	.785	1.000	
	MATH-CONFI	.676	.668	.569	.594	1.000
Sig. (Unilateral)	COMPU-CONFI					
	MATH-MOTI	.000				
	MATH-ENGA	.000	.000			
	INTE-MACO	.000	.000	.000		
	MATH-CONFI	.000	.000	.000	.000	
Bartlett's test of Sphericity 539.612 (α=0.00) df 10						
Measure of sampling adequacy (overall) (KMO) 0.859						
a. Determinant = .035						

Source: self-made.

The contrast values of Bartlett's test allow us to say that the correlation matrix is significance (α=0.00) when taken all variables (table 2). The measure of overall sampling adequacy (overall) (KMO) is 0.859 which's acceptable (>0.50). The examination of the values of each variable identifies that all variables have values greater than 0.5, table 3 shows the measures sample adequacy for each variable (MSA)

Table 3 Measure of sampling adequacy (MSA)

Variable	COMPU-CONFI	MATH-MOTI	MATH-ENGA	INTE-MACO	MATH-CONFI
COMPU-CONFI	.868[a]				
MATH-MOTI	-.063	.884[a]			
MATH-ENGA	-.283	-.191	.846[a]		
INTE-MACO	-.314	-.127	-.474	.848[a]	
MATH-CONFI	-.336	-.395	.020	-.062	.853[a]

Source: self- made

Table 4 denominated component matrix and communalities, shows just one factor that incorporates five variables and their explanatory power expressed by its eigenvalues (3.664). The values in the first column reflect the factor

loadings of each variable and the second column reveals how each variable is explained by the components. Thus, we can see that the greatest weight variable is COMPU-CONFI (computer confidence) followed by the INTE-MACO (interaction between the computer and mathematics), and MATH-ENGA (mathematics engagement) and with the lowest weight is the MATH-CONFI (mathematics confidence) followed by the MATH-MOTI (mathematics motivation).

Table 4 Component Matrix and Communalities

	Component 1	Communalities
COMPU-CONFI	**.887**	.799
MATH-MOTI	.823	.794
MATH-ENGA	**.872**	.868
INTE-MACO	**.881**	.867
MATH-CONFI	.814	.867
Eigenvalues	3.664	
% Total variance		73.279

Source: self-made

6. CONCLUSION

The aim of this work was to examining how mathematics confidence, mathematics motivation, computer confidence, computer motivation, computer-mathematics interaction and mathematics engagement help to understand the students' attitude toward mathematics and technology. The results provide empirical evidence to assert that there is a relationship between the factors proposed by Galbraith and Hines (1998) explaining the attitude towards mathematics and technology in college students. Furthermore, these results are according to the exposed by Galbraith and Hines (2000), Cretchley and Galbraith, (2002).

The results give empirical evidence resulting from application of the scale of Galbraith and Hines to show that the student shows a greater trend toward confidence indicator toward computers, followed by the interaction toward mathematics and computer and finally the engagement toward mathematics. Thus, a specific way H3 is accepted and the rest H1, H2, H4 and H5 are rejected. However, in general way Ho is rejected because; there are factors that contribute to understand the students' attitude towards mathematics and technology, if we consider the scale proposed by Galbraith and Hines

These outcomes are somewhat different with those obtained by García-Santillán, Escalera, Boggero and Vela (2012) in a study performed at private university in undergraduate students, whose tendency being towards indicator motivation toward mathematics, the mathematics confidence and finally mathematics and computer interaction.

In another study performed at a public university (UASLP) Garcia-Santillán, Flores, Escalera, Chong and Lopez (2012) showed that the motivating factor toward mathematics and confidence toward computers, are the main factors contributing to explanation of the phenomenon of study.

In this sense, Garcia-Santillán, Escalera and Edel (2011), Garcia-Santillán and Escalera (2011) in another studies, they have shown that the processes of teaching-learning are favored by the presence of ICT, contributing significantly to the education of mathematics, whatever the classification of mathematics.

Finally, the results show overall a positive attitude towards mathematics and technology by the student. In addition the professors that impart this matter must do not only have the knowledge, but also abilities which make it possible the implementation of didactic actions, so that the teaching-learning process can be better, in order to strengthen the student's attitude. Furthermore, with this research we seek to demonstrate the implications of: confidence, motivation, engagement and the interaction with technology in the learning process. As Galbraith-Haines (1998, 2000), we conclude that the latent variables: Math confidence, Mathematics Motivation, Mathematics Engagement, Computer confidence, Computer-Mathematics Interaction, help us to understand the students attitude towards mathematics and technology.

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Appendix

Attitude scales toward: maths confidence, computer confidence, maths-tech attitudes, maths-tech experience (Galbraith, P. & Haines, C. 1998-2000).

Mathematics Confidence	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
Mathematics is a subject in which I get value for effort					
The prospect of having to learn new mathematics makes me nervous					
I can get good results in mathematics					
I am more worried about mathematics than any other subject					
Having to learn difficult topics in mathematics does not worry me					
No matter how much I study, mathematics is always difficult for me					
I am not naturally good at mathematics					
I have a lot of confidence when it comes to mathematics.					
Mathematics Motivation	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
Mathematics is a subject I enjoy doing					
Having to spend a lot time on a mathematics problem frustrates me					
I don't understand how some people can get so enthusiastic about doing mathematics					
I can become completely absorbed doing mathematics problems					
If something about mathematics puzzles me, I would rather be given the answer than have to work it out myself					
I like to stick at a mathematics problem until I get it out					
The defy of understanding mathematics does not appeal to me					
If something about mathematics puzzles me, I find myself find about it afterwards.					
Mathematics Engagement	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
I prefer to work with symbols (algebra) than with pictures (diagrams and graphs)					
I prefer to work on my own than in a group					
I find working through examples less effective than memorizing given material					
I find it helpful to test understanding by attempting exercises and Problems					
When studying mathematics I try to link new ideas or knowledge I already have					
When learning new mathematical material I make notes to help me understand and remember					
I like to revise topics all at once rather than space out my study					
I do not usually make time to check my own working to find and correct errors					
Computer confidence	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
As a male/female (cross out which does not apply) I feel disadvantage in having to use computers					
I have a lot of self-confidence in using computers					

I feel more confident of my answers with a computer to help me					
If a computer program I am using goes wrong, I panic					
I feel nervous when I have to learn new procedures on a computer					
I am confident that I can master any computer procedure that is needed for my course					
I do not trust myself to get the right answer using a computer					
If I make a mistake when using a computer I am usually able to work out what to do for myself					
Computer-Mathematics Interaction	Lowest 1	Low 2	Neutral 3	High 4	Highest 5
Computers help me to learn better by providing many examples to work through					
I find it difficult to transfer understanding from a computer screen to my head					
By looking after messy calculations, computers make it easier to learn essential ideas					
When I read a computer screen, I tend to gloss over the details of the mathematics					
I find it helpful to make notes in addition to copying material from the screen, or obtaining a printout					
I rarely review the material soon after a computer session is finished					
Following keyboard instructions takes my attention away from the mathematics					
Computers help me to link knowledge e.g. the shapes of graphs and their equations					

SYMBIOTIC RELATIONSHIP BETWEEN TELECENTRE AND LIFELONG LEARNING FOR RURAL COMMUNITY DEVELOPMENT: A MALAYSIAN EXPERIENCE

Jalaluddin Abdul Malek
E-Community Research Centres, Faculty of Social Sciences and Humanities,
Universiti Kebangsaan Malaysia, UKM Bangi, Selangor, Malaysia
jbam@ukm.my

Abdul Razaq Ahmad
Faculty of Education, Universiti Kebangsaan Malaysia, UKM Bangi, Selangor, Malaysia
razaq@ukm.my

Mohd Mahzan Awang
Faculty of Education, Universiti Kebangsaan Malaysia, UKM Bangi, Selangor, Malaysia
mahzan@ukm.my

Alfitri
Faculty of Social and Political Sciences, University of Srivijaya, Indonesia
al_fitri2002@yahoo.com

ABSTRACT
Telecentres in the 21st century may be able to improve standard of living, quality of life, and stability of knowledge for the rural population. The role of telecentres is widely increasing in developing political and management awareness, economic, socio-culture, technology, education and regulation awareness in rural communities. Telecentres in this context is a premise or a centre of information and communications technology (ICT) for rural residents to obtain information and knowledge. The major role of telecentre is to bridge the digital divide and socio-economic gap between rural and urban population. Telecentre is also a centre of lifelong learning activities for the rural population to seek formal and informal knowledge. This paper is intended to demonstrate the development of telecentre experiences in Malaysia that focuses on scholarly activities through lifelong learning of the rural population. The scope of discussion depicts the seven routes of informal symbiosis between lifelong learning with the telecentres that gave positive impact on rural development in Malaysia. The discussion is based on the discourse and experience of telecentre development in Malaysia.

Keywords: Telecentres, Lifelong Learning, Rural Population

1. INTRODUCTION
Historically telecentre was known as Telecottage in Sweden, in Denmark's Electronic Village Halls, and Community Technology Centres in the USA. In the cities, it works like a cyber café and information kiosks but differ in terms of goals and operation. Telecenter is a specifically built premise to provide facilities of ICT literacy, information, and knowledge to the rural population (Parkinson 2005). It is also the centre of training for the development of ICT for marginalized rural population such as the poor, women, children, disabled, elderly, indigenous people, SMME and youth. The key role of a telecentre is to bridge the digital gap between urban and rural areas. In other countries, it is known as Cyberdhabas telecentres in India, Cybercefes in Latin America, Vishva Gnana Kendra in Sri Lanka and Net Cafes, Internet cafe or WARNET in Indonesia (Aalami & Pal 2005).

Telecentre development in Malaysia began in year 2000. It's development was pioneered by agencies such as Ministry of Science, Technology and Innovation (MOSTI), Ministry of Rural and Regional Development (MRRD), Malaysian Communications and Multimedia Commission (MCMC), Ministry of Information, Communication and Culture (MICC), Ministry of Youth and Sports (KBS), Ministry of Housing and Local Government (MHLG) and state governments. To date over 2,000 Telecentres are operating under the supervision of these various agencies. Telecentre project in Malaysia is known by various names, such as Rural Internet Centre (PID), *Medan Info Desa* (MID), Community Broadband Centre (CBC), *Kedai.Com*, USP Communication Center (UCC), Rural Broadband Library, Universal Service Provision (USP) and *Bestari.Com* in Terengganu (ESCAP 2006).

2. TELECENTRES IN MALAYSIA AND LIFELONG LEARNING

Community Broadband Centre (CBC) is a telecentre that stimulate lifelong learning in Malaysia. It is one of the projects implemented under the Universal Service Provision Program (USP) by the MCMC. To date, there are 168 CBC established in the country under the supervision of Telekom Malaysia (TM). In general, the objective of the CBC is bridging the digital gap between rural and urban communities. Among the lifelong learning in CBC are basic computer introduction courses, basic courses for the Internet and electronic applications, desktop publishing such as Microsoft Office. The next Telecentre is Village Info Square (*Medan Info Desa @ MID*). It is a public telecentre run by an appointed telecentre manager and equipped with ICT infrastructure and focuses on the development of ICT for rural communities. MID is also a centre for circulating information and a catalyst to bridge the digital gap through a lifelong learning such as e-commerce entrepreneurship training and ICT skills. People's Information Centre or *Pusat Maklumat Rakyat* (PMR) is a telecentre that offer ICT services in each district office and it is free. PMR is the result of National Information Council or *Majlis Penerangan Kebangsaan* (MPK) Bill. 1/2005 on February 28, 2005 meeting. Although PMR has no specific program but there arelifelong learning for the community such as dissemination of information about government policies, and as a centre of online information.

Community Broadband Library (CBL) is the government's efforts to bridge the digital gap between rural and urban population. It also aims to develop ICT literate human capital and high quality IT entrepreneurs. CBL is a lifelong learning centre, originally known as the village library. MCMC in collaboration with Telekom Malaysia Berhad (TM) is upgrading several libraries in rural areas to become CBLs, equipped with computer and internet connection. CBL lifelong learning facilities such as ICT-related learning activities, computers, connection to the internet, and facilities for printing, scanning and copying.

Rural Internet Centre (PID) has been launched and implemented in 2000 with an initial amount of 14 pilot sites selected across the country. The main objective of PID program is to bridge the digital gap between urban and rural areas through the provision of ICT infrastructure and the provision of free training to rural communities. By 2003, 42 PID was built in post offices throughout Malaysia. The function of PID has been enhanced as Community Knowledge Centre and a one-stop centre for e-Government, e-learning, communication centre, test centre and skills training courses with certification.

3. SYMBIOTIC SUSTAINABILITY OF TELECENTRE AND LIFELONG LEARNING

The United Nations (UN) recognised the role of telecentres to empower rural development in particular through lifelong learning based ICT projects for development (ICT4D). Lifelong learning means that all activities undertaken in the form of learning to meet the needs of human life (World Bank 2003). Its main purpose is to improve formal and informal knowledge, to enhance the skills and competencies of the human person in terms of career, social, ethical, and civic as well as thought. Lifelong education telecentres are made formal and informal so that rural people can adapt to current changes, and can be active in the field of socio-economic development. Among the lifelong learning program held in the telecentres are formal learning such as courses, vocational and technical skill certification organized by higher learning institutions. Non-formal learning, such as survival skills and learning between the generations, for example, parents learn to use ICT with their children, or children learn how to play computer games with friends. Lifelong learning in telecentres has been bridging the digital divide and knowledge gaps among Malaysians. Statistics by MCMC in quarter of 2012 showed broadband penetration rate is 62.9 per cent of Malaysia's population. Similarly, the cellular phone ownership is in the ratio of 128.7 per 100 populations in Malaysia. Statistical year 2009 also showed 35.1 households in Malaysia own a personal computer (MCMC 2012).

Sustainability of telecentre through lifelong learning programs can be viewed on the theory of symbiosis. The term symbiosis means living together. In Latin, `sym' means "with" and `bíōsis' means "living." This means that symbiosis means living together have in common, synonymous with, together, sticks, and as one (Saffo 1993). There are two types of symbiosis. First, is the continuity of symbiotic and long lasting, and secondly is symbiosis with no continuity and temporary. In the context of this discussion, the focus will be on continuity and long lasting. Symbiosis has its own nature that is to realise the meaning of synonymous together. It means that all members must participate, must be in the same union, have fun with, willing to share common interest and profit, and are willing to bear the risk together (Douglas 2010). In the context of symbiosis between telecentres and continuous learning, it begins with the human himself. This means that the sustainability of the telecentre, human and learning have symbiotically goal of relationship. First, the relationship between man and his Creator (M2C) namely obedience. Second, the relationship with another human (M2M), which is called socialisation. Third, the relationship of human, and its surroundings (M2E), which is called sustainability. Fourth, the relationship between human and Technology (M2T) called knowledge (Figure 1).

The four basic sustainability of symbiosis telecentres are very important as a basis for development of telecentre as a centre for lifelong learning. Based on the four types of symbiosis, the development of telecentres as a centre for lifelong learning can be achieved based on seven routes symbiosis.
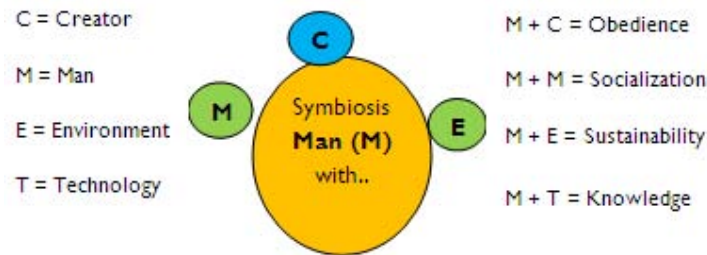
Figure 1: Sustainability of Symbiosis Telecentre and Knowledge

Symbiosis 1: Centre for Social Knowledge Engineering Village Community.
Various functions of telecentres progress can be realised when the development is in symbiosis with social, physical and spiritual aspects. Telecentres not only act as a centre of ICT facilities, but also a social science engineering centre that include the development of the rural community of thought, body and spirit. From the social point of view, telecentres develop communication networks, networks of knowledge and networked society. Telecentres as social science engineering centre is also developing the physical aspects of the population, especially to support K-economic progress and development of a knowledge society (Figure 2). This symbiosis can realise the implementation of the K-economy and create a society that is capable of producing new knowledge in all areas for national development (Elkington, Hartigan & Schwab 2008).

From the aspect of thought and knowledge, telecentre serves as a centre of spiritual education to rural communities. Islamic Da'wah, including engaging the community with integrity and ethical teaching can be done. Campaigns fostering moral values in society, particularly rural communities are abound on the internet. In this regard, many websites on the field of Islam is preaching. Users only need to choose website in accordance with the Islamic faith and topics of interest wisely. (Zulkiple Abd Ghani, 2010). Maturity of thinking, physical, and spirit of rural communities with ICT in the telecentre for continuous learning can facilitate the process of achieving national development agenda.
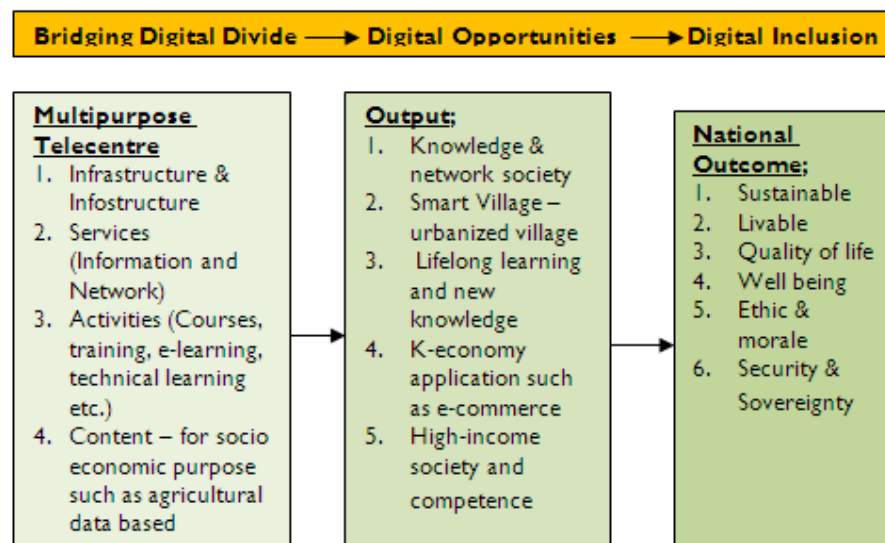
Figure 2: Telecentre and Social Knowledge Engineering

Symbiosis 2: Urbanise the village through cyberspace education.
Based on the historical development of Malaysia, urbanising the village through the cyberspace is a mechanisme forrural development during the New Economic Policy (NEP) from 1971 to 1990. In the era of the 1970s and 1980s, the term `rural urbanise' with city convenience is a popular approach in rural development. This approach aims to tackle the high migration rate of rural population to the urban and metropolitan areas. Within the period of Malaysia National Plan 2 (RMK2) to RMK5 the program to urbanise the village through the spatial

development was undertaken by the Government. Traditional village that has the potential to be developed are being upgraded as a Rural Growth Centres (PPD). PPD is the final stage of growth centres that offer such services in the cities.

The advancement of ICT technology and the support of the government through taxation of ICT and sponsored public ICT programs has helped fuel the development of the rural urbanisation approach. 'One computer per household' and the 'rural telecentre projects' are sample programs that tries to connect the village to the cyberspace. Cyberspace refers to a virtual space that is used to surf the internet for obtaining information and knowledge (Figure 3). Cyberspace is also a fast knowledge stream regardless of space and times. Cyberspace also means that knowledge can be accessed in the same place same time, same place different time, another place at another time and another place and time (ESCAP, 2006).

Directions of various functions of telecentre development direction as shown in Figure 3 requires appropriate methods and approaches to spur the link between the village and the cyberspace. In 2012, the Malaysian government targets to upgrade telecentre as Rural Transformation Centre (RTC) and a catalyst for smart village development. The effect of this drive is the transformation from rural communities to smart rural community (Malaysia 2002). The digital opportunity and success of urbanising `village through cyberspace knowledge', depends on the attitude and co-operation of the rural population as outlined in the Development Vision Policy (Malaysia 2001).

Symbiosis 3: Developing knowledgeable Smart Village.
In the year 2010 and later, the development of telecentres in Malaysia has a greater role in addition to developing information structure services and infrastructure. Telecentres are considered as an important facility that can realise the emergence of a smart village. MID under MRRD has been upgraded as Mini Rural Transformation Centre or Mini-RTC. Among the roles of Mini-RTC are as a business, marketing and entrepreneurial centre. Mini-RTC in a smart village also serves as a centre of education and continuous learning in the field of vocational and technical skills to rural youth.
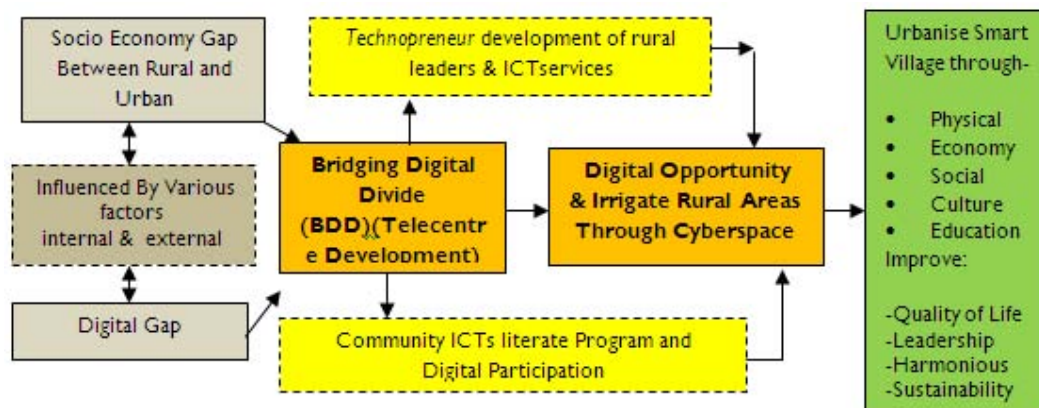
Source: modified from Aalami & Pal 2005 and ESCAP 2006
Figure 3: Praxiology of Urbanising Rural Areas through Cyberspace

Telecentre sustainability is symbiotic with rural community development in creating a Knowledge-based Rural Society – KbRS. Smart village will not be successful without KbRS. This is because the development of KbRS must have the cooperation and collaboration of rural communities. KbRS is a society that is open and willing to accept change, including the interest in lifelong learning for socio-economic progress and well-being (Longworth 2001 & Longworth 2006). Various function of telecentre sustainability is able to realize the vision, objectives, and strategies of Smart Village as shown in Figure 4.

Source: MiGHT 2011
Figure 4: Smart Village

Symbiosis 4: Developing E-Commerce and E-Industrial Knowledgeable Community throughout life.
Sustainability of telecentre is symbiotic with social programs and social business enterprise (Figure 5). The evolution of telecentres must be able to meet the needs of the rural society and in turn enhance rural entrepreneurship. Telecentre is a cyber business premise that provides a social service to the rural population. Social service efforts of telecentres are called social business and social enterprise. Telecentres may produce innovative and creative entrepreneurs in the social field, particularly among telecentres business managers. (Mankani, 2003).

Social business and social enterprise is a business that aims to focus on social objectives rather than profit. Type of business and social forms of social enterprise business can be likened to legal bureau services, counselling centres, micro-credit as Grameen Bank project, and recycling business through telecentres (Yunus 2007). Figure 5 shows the influence social business and social enterprise on e-Commerce) and e-Industrial lifelong knowledge Community in rural areas.
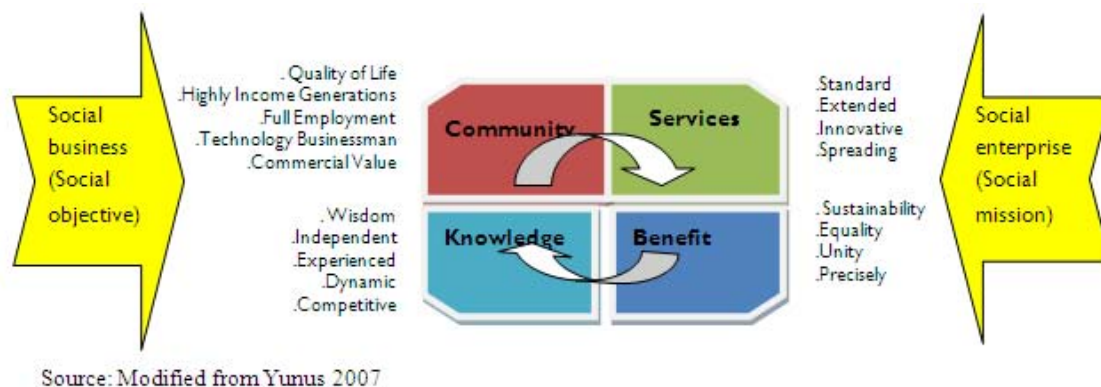
Figure 5: Social Business and Social Enterprise in Telecenters

Symbiosis 5: Realising E-Development and Reconciliation based on knowledgeable society.
The viability of various functions of the telecentres is in agreement with Malaysia's Vision 2020 to become a developed country and knowledgeable community. E-Development and Reconciliation through continuous learning process can occur in rural communities to develop together with Vision 2020. Reconciliation means to change from good to better (Wan Mohd Nor Wan Daud 2001). This means that when telecentre program is in symbiosis with reconciliation activities, it complements the progress of e-development (Figure 6).

When e-development and reconciliation is in symbiosis with the role of telecentres, the benefits can be seen either at the macro, meso and micro level (Figure 6). At the macro level, telecentres plays an active role in national development vision. At the meso level, they enables the implementation of e-government systems, the K-economy and knowledge society based on civil society. At the micro level, the impact of improved quality of life, safety and welfare of households, particularly the target rural population who are isolated. Continuous learning activities through the government portal access at telecentres are able to foster the spirit of progress among the rural population. Rural communities are able to make adjustment to be able to be an advanced knowledge society with the disclosure of information, knowledge of the internet and continuing education in the rural areas.

Symbiosis 6: Strengthening the Identity of Knowledgeable Nation in Rural Areas.
There are limited platforms in the past to develop self-reliance and developing nations. Telecentre role as a centre of lifelong learning can be in symbiosis with activities to strengthen the development of knowledgeable people who have a sense of identity, love people, and love of country. The focus is through programs that enhances human capital, social capital and thus increase economic capital (Figure 7).

Figure 6: Sustainable Development and Reconciliation
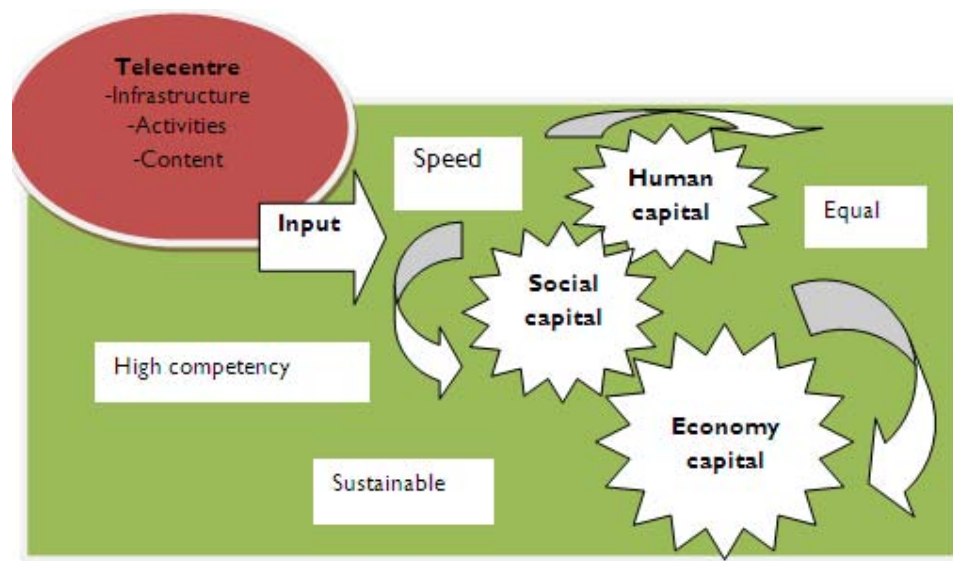
Figure 7: The Development of Identity for Knowledgeable Nation (Human Capital and Social Capital)

The successful development of the nation under the New Economic Model (2011-2020) requires the role of telecentres to become a premise to strengthen self-reliance among knowledgeable people in rural communities. Speed, driving force, stability, and competitiveness of human capital, social capital and economic capital can be raised through the rural communities as quickly as possible through the telecentre's role as a centre for lifelong learning.

Training and skills whether it is non-academic or vocational skills in the telecentres can accelerate progress on human, social and economic capital in rural communities, particularly the youth. Awareness programs and the advancement of literacy like 1Malaysia transformation campaign can be accessed directly via a computer web site at the telecentre. Indirectly, human capital can be nurtured to produce individuals who have the skills and integrity. Furthermore, social capital can be enhanced through rural communities because they have a wide range of network and communications globally for the use of internet facilities at the telecentre. Through this continuous network, the rural communities in long-term will get the latest information and knowledge to enhance their progress. Automatically, the outcome of human capital strength and social capital will eventually strengthen the rural economy.
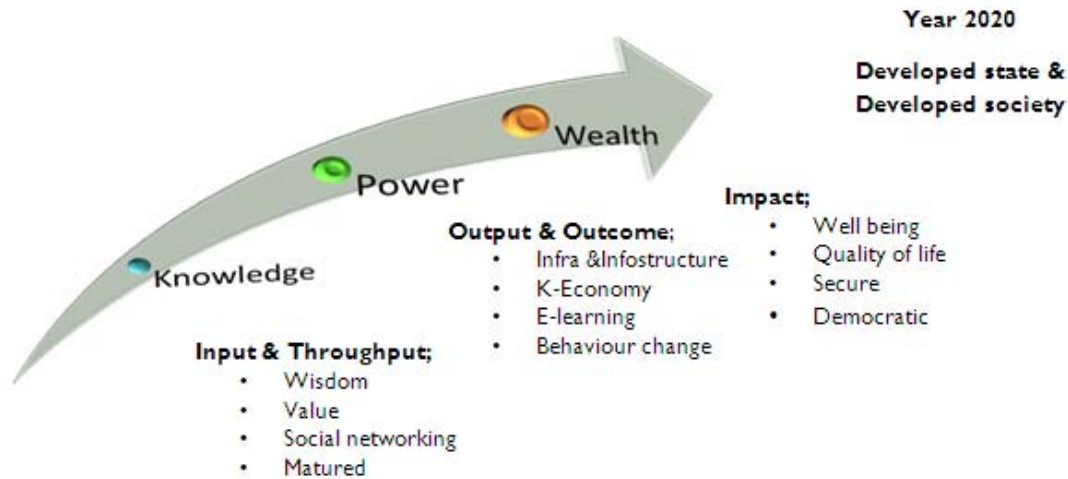
Figure 8: The Curve Progressive of Knowledgeable and Advanced Community

Symbiosis 7: Expedite the Presence of Knowledgeable Society in rural areas.
Integrating telecentres with lifelong learning may accelerate the existence of a society that has the advantage of knowledge, power, and wealth. Knowledge, power, and wealth in the form of material and non-material are important factors for a country;s development in this postmodern era. Accession to the digital age and the use of telecentres interpreted through the concept of community participation in the process of continuous learning in the telecentre. Active participation of digital community is a democratic and contributed society. They can create new sources of wealth and useful knowledge on an ongoing basis. This community is capable of thinking, creativity, and innovation and wise. In the end they form power either in the form of physical power, economic, social, cultural, and/or political power (Figure 8).

Democratic society is a civil society whom has the power to influence their own living environment. They have independent thought, but a structured, high quality of life and live a sustainable competitive environment. Security and sovereignty is secure even when they are exposed to the cyberspace that has no borders. This community is able to create wealth whether the wealth in the form of physical, spiritual and knowledge. Democratic society who uses telecentres has high knowledge effect of continuous learning program. They become catalyists for a country's development.. They are obsessed with the achievement of material alone, but also with non-material progress. As a result, this lifelong learning society reaches the peak to become a developed nation and developed society respected in the international arena (Figure 8).

CONCLUSION
In conclusion, the symbiosis between telecentre and lifelong learning can achieve the goals of development in Malaysia to become a developed, independent, and competitive rural community. Telecenter role as a centre of lifelong learning is directly fostering a culture of innovation, creative and proactive in pursuit of rural development. Through the cooperation of various parties, the digital gap (a.k.a socio economic gap) between urban and rural communities may be reduced. As a result, efforts to bridging the digital divide will be more effective and the existence of digital opportunities will be expanded as in the smart village community. However, there is still unclear the extent to which the telecentre is fully utilised by rural communities in Malaysia. Future studies in this area is highly needed.

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TEACHERS' AND STUDENTS' PERCEPTIONS OF INTERACTIVE WHITEBOARDS IN THE ENGLISH AS A FOREIGN LANGUAGE CLASSROOM

Hüseyin Öz
Department of Foreign Language Education, Faculty of Education, Hacettepe University, Ankara 06800, Turkey
hoz@hacettepe.edu.tr

ABSTRACT
This article reports on the findings of a study conducted to investigate teachers' and students' perceptions of interactive whiteboards (IWBs) in the English as a foreign language (EFL) classroom and to find out differences of perceptions according to some variables such as gender, level of English proficiency, hours of weekly IWB use, and years of teaching experience. Two self-report questionnaires were used to gather main data from 58 EFL teachers and 164 EFL students in a private Anatolian high school in Ankara where IWBs were installed and actively operated by teachers in classrooms. The student questionnaire consisted of 26 five-point Likert-scale items to measure the student's perceptions about (1) *Perceived Learning Contribution*, (2) *Motivation*, (3) *Perceived Efficiency*, and (4) *Perceived Negative Effects*, whereas the teacher questionnaire included 25 five-point Likert-scale items to measure their perceptions about (1) *Instructional Effects of IWBs*, (2) *General Attitudes*, (3) *Motivational Effects of IWBs*, and (4) *Need for Training*. Quantitative data was further supported by qualitative data gathered from teachers through open-ended questions. The findings revealed that overall both teachers and students have favorable perceptions of the IWB technology and its benefits in EFL classrooms. However, the results of t-test and One-way ANOVA tests showed no significant difference in the teachers' perceptions of IWB use with respect to their gender and years of experience. Female and male students did not have any significantly different perceptions of the IWB technology either. However, the results of One-way ANOVA revealed that students differ in their perceptions according to their level of English proficiency and hours of weekly IWB use. Another finding indicated that teachers with more years of teaching experience had more favorable perceptions of IWBs than less experienced teachers and that teachers who use IWBs more frequently have more positive perspectives on the use of the IWB technology. Similarly, it was found that the more students got involved in using IWBs, the more their perceptions changed favorably. The results of qualitative data also supported the findings of teachers' self-reported perceptions in relation to the general attitudes on the pros and cons of IWB use in EFL classrooms. Another major finding of the study revealed that teachers need training for this technology in order to acquire the essential competencies in pre-service and in-service training programs. Further research in this area could be an investigation of pedagogical approaches to integrate IWBs in the EFL classroom.

Keywords: Interactive whiteboard; Teachers' perceptions; Students' perceptions; English language teaching (ELT); Foreign/second language (L2) teaching and learning

INTRODUCTION
Over the last decade there has been a growing interest in the use of information and communication technologies (ICT) in education in general and second or foreign (L2) teaching and learning in particular. Indeed, the amount of monetary resources invested in educational technology as well as the rhetoric of official publications in support of ICT integration indicates that many schools and governments in the developed and developing countries have confidence in the abilities of ICT to enhance educational processes (Bax, 2000; Betcher and Lee, 2009; Moss et al., 2007; MoNE, 2010; Thomas and Schmid, 2010; Yang and Teng, 2014). In fact, there is overwhelming evidence confirming the notion that ICT has greatly transformed the educational operations and processes in many contemporary institutions (Duran and Cruz, 2011; Thomas & Schmid, 2010). L2 learners in the present day schools are provided with numerous opportunities to interact in online virtual life occurrences by the use of technology such as multimedia resources and the internet. By being allowed an opportunity to engage in online virtual encounters, L2 learners are presented with a chance to develop and broaden their intellectual and communication skills (Coyle, Yañez and Verdú, 2010; Millum and Warren, 2014) as well as critical cultural awareness (Byram, 1997). In turn, this connects the educational institutions to the world around them by making intercultural contact more effective.

In line with the aforementioned developments, faith and motivation in ICT, there has also been an ever increasing interest in utilizing interactive whiteboards (IWB) in classrooms as this technology is perceived as combining all pre-existing instructional aids such as chalkboard, whiteboard, television, video, overhead

projector, CD player, and computer (Yáñez and Coyle, 2011, p. 446). Even though the IWB technology is relatively a new phenomenon as it was originally designed for commercial settings (DiGregorio and Sobel-Lojeski, 2010; Higgins, Beauchamp and Miller, 2007), it is increasingly utilized in language classrooms all over the world. As also indicated by Coyle, Yañez and Verdú (2010), it provides L2 teachers with many opportunities to teach in novel, exciting and promising ways that go far beyond the possibilities of traditional boards. On these grounds, it can be argued that IWBs are now a fact of everyday life as governments, school managers and directors also perceive them as a "must have" device "to keep up to date and to be seen as having the latest equipment" (Hockly, 2013, p. 356).

On the other hand, technology alone is not a panacea in L2 teaching and learning (Johnsona, Ramanaira and Brineb, 2010). In fact, there is not enough empirical research evidence regarding the effectiveness of the IWB technology in L2 teaching and learning. According to Hockly (2013), for example, there is not much reference to any specific improvements in student attainment due to the use of the IBWs in the language classroom. Furthermore, in their recent meta-analysis research into the use of technology in L2 teaching in the primary and secondary sectors, Macaro, Handley and Walter (2012) indicated that there is slight and inconclusive evidence that technology has a direct beneficial impact on linguistic 'outcomes', "but it may impact indirectly and positively on learner attitudes and behaviours and may promote collaboration" (p. 1). This assertion is supported by the findings of educational researchers who report that students and teachers have or develop positive attitudes toward the IWB (Elaziz, 2008; Levy, 2002; Hall and Higgins, 2005; Türel, 2011; Türel and Johnson, 2012) and that it increases interest and motivation among students and teachers (Mathews-Aydinli & Elaziz, 2010; Johnsona, Ramanaira and Brineb, 2010). Consequently, the overall aim of this study is to explore teachers' and students' perceptions of the IWB technology use in teaching and learning English a foreign language (EFL). It also aims to investigate whether there are differences of perceptions in terms of some variables such as gender, proficiency level and years of teaching experience.

LITERATURE REVIEW
An IWB is commonly defined as a system made up of a computer connected to a data projector and a board. It is a large, touch-sensitive, interactive display system that forms a link between a teaching surface and a digital projector and computer (BECTA 2003; De Vita et al., 2014; Miller and Grover, 2010). In addition to being large and very touch sensitive, the board exhibits the projected representations and allows the teacher and students to manipulate them. An average IWB has the capacity to transmit information from the board to the computer immediately after the screen is touched (Duran and Cruz, 2011). While most IWBs are designed to have a pen and software comprised of dragging and dropping abilities, some IWBs may be operated by using a finger.

IWBs can have many positive effects on teaching and learning in general. For teachers, for example, during regular class hours they provide the opportunity to integrate more ICT into lessons, enable teachers to utilize a wide range of web-based resources, and encourage them to save and print their notes that they make during lessons. Moreover, IWBs have the potential to increase student enjoyment and motivation, to provide more opportunities for student participation and cooperation by developing students' personal and social skills, and to promote students' creativity when they engage in giving presentations in front of their peers (see BECTA, 2003 for details).

Several other benefits can be associated with the utilization of IWBs in L2 teaching and learning. For example, Schmid and Schimmack (2010, p. 198) describe four educational benefits of using the IWB technology in L2 classrooms: a) facilitating the integration of new media in the regular language classroom, b) enhancing the scope of interactivity and learner engagement in the lesson, c) supporting the development of so-called "electronic literacies", and d) meeting the needs of students with diverse learning styles (aural, visual and kinesthetic) through the use of multiple media. Similarly, (Gray, 2010, p. 71) points out that the IWB has "the capacity to facilitate more individualized styles and rates of learning." Thus, it is fair to suggest that students who make use of this technology are more independent and possess a sense of direction. According to Duran and Cruz (2011), L2 learners in IWB classrooms are more attentive, engaged, and supportive of each other since they find the lessons more interesting and fun. Finally, Beeland (2002) points out that use of the IWBs in L2 classrooms is very effective in enhancing and increasing the levels of learner engagement in the teaching and learning activities.

In spite of the benefits of IWBs in classrooms, there are also some challenges that the use of IWBs may pose in L2 teaching and learning. These challenges often consist of technical issues such as the breaking down of IWBs (Thomas & Schmid, 2010; Armstrong et al., 2005), high cost of IWBs (Elaziz, 2008; Thomas & Schmid, 2010), lack of teachers' confidence and ICT skills in using IWBs (Hall and Higgins, 2005, Levy, 2002; Smith, Higgins, Wall and Miller, 2005), extra time required for teachers to plan and prepare materials (Gray, Hagger-Vaughan,

Pilkington and Tomkins, 2005; Thomas & Schmid, 2010), and special training required for teachers to appropriately use IWBs and to support their selection of appropriate software (Isman, Abanmy, Hussein and All-Saadany, 2012; Thomas & Schmid, 2010; Armstrong et al. 2005; Gray et al., 2005; Hall and Higgins, 2005; Levy, 2002; Moss et al., 2007). Of these challenges, language teachers' training for IWB use seems very significant in order to make the most of this technology. In fact, teachers must be proficient and well-trained in using IWBs. According to Betcher and Lee (2009), effective IWB teaching requires that the teacher be organized, interactive, flexible, constructive, willing to share their knowledge, open-minded, and ready to create teaching and learning plans.

Even though IWBs bring about some challenges, it seems that the underlying argument in favor of IWBs often relates to positive perspectives, interest and motivation among students and teachers. For example, in a study by Moss et al. (2007, p. 53), it was discovered that both the teachers and learners in classrooms had generally favorable attitudes towards the use of the IWB technology. Most respondents reported that the major benefits of the IWB technology emanated from the increased quality of display of the educational content being taught or learned. Smith, Higgins, Wall and Miller (2005) argue that the ease of usability and the versatility of the technology play an important role in attitudes towards the use of the IWB technology. Their study indicated that learners favored the IWB technology since they found a computer keyboard and mouse difficult to handle and operate. Some learners also favored the technology since it assisted them in improving their handwritings. On the other hand, Türel and Johnson (2012) examined teachers' beliefs and use of the IWB technology for teaching and learning in Turkish primary and high schools. Their findings revealed that in order to facilitate learning and instruction teachers should engage in the IWB use more frequently, collaborate with colleagues and get training on effective instructional strategies regarding the IWB use.

In addition to the aforementioned research into the overall use of the IWB technology in education, studies into teachers' and learners' perspectives on IWBs in L2 teaching and learning have come to emerge. For example, Matthews-Aydinli and Elaziz (2010) carried out a study in order to determine the attitudes and opinions of EFL learners and teachers in Turkey on the use of IWB technology. Reportedly, both the students and teachers indicated positive attitudes towards the IWB technology. Believing that the technology was beneficial in language learning, both teachers and students were comfortable in using the device. Similarly, the findings of a study by Duran and Cruz (2011) revealed that learners were more motivated and liked lessons in which IWBs were used since these lessons were "quicker, more fun, and more exciting". In addition to this, Barber et al. (2007) state that learners in classrooms where the IWB technology was utilized were more attentive, supportive, and encouraging to each other when one of them was at the board operating the technology. Such research reports are also supported by a recent study that investigated the perceptions of a teacher and students of the effectiveness of the IWB in facilitating various aspects of Chinese language learning (Xu and Moloney, 2012). However, Duran and Cruz (2011) assert that a positive impact in L2 teaching and learning does not depend so much on the devices and technology utilized in the process as on the manner in which the tools and technologies are utilized. Teachers can only make effective use of IWBs if they have a positive attitude towards the technology.

Another recent study by Coyle et al. (2010) investigated the impact of IWBs on the language use of a primary school teacher and a group of native and non-native speaker children in an English language immersion classroom. Their findings revealed that even though the teacher created opportunities for the children to engage in tactile interaction with the board by taking advantage of multimedia presentations in Numeracy and Literacy, opportunities to participate in the dialogic interaction beyond the production of one or two word utterances were limited and largely restricted to the NS children in the group. In another study that investigated L2 learners' perceptions of learning with IWBs, Yáñez and Coyle (2011) conducted a small-scale study that focused on an English language immersion classroom in a British primary school in Spain. Their findings indicated that children desired to interact more with the IWB and that its multimodal properties were important and appealing to particularly the non-native speakers (NNS). On the other hand, Johnsona et al. (2010) indicated that although a majority of learners and teachers in language classrooms appreciate the benefits of IWBs, they are convinced that it is not necessary for them to learn or teach language more effectively. Likewise, Schmid and Schimmack (2010) investigated the attitudes of teachers towards the use of IWB and technology in language classes and found out that in spite of naming a few benefits of the technology, all of the teachers engaged in the research reported that the use of IWB technology did not enhance their teaching in a significant manner. According to the teachers, the gains of IWB technology, such as accessing the internet easily, could be enjoyed by using simpler alternatives such as computer-projector systems.

In a most recent study carried out in Turkey, Toscu (2013) investigated the relationship between classroom interaction and IWB use in tertiary level EFL classes and compared the types of interaction patterns that

occurred in classes equipped with either IWBs or traditional whiteboards. Her findings indicated that there were not any significant differences of interaction patterns, neither positive nor negative, between the IWB and the non-IWB groups of L2 learners and teachers. Her research implies that the IWB technology alone does not play a crucial role in promoting L2 classroom interaction. Consequently, the findings of these studies demonstrate that teacher training for IWBs should be given priority and based on such technological and pedagogical principles as learning how to effectively manage the IWB as a teaching resource, developing a critical and creative attitude toward software or materials designed to promote learning and, particularly, learning how to promote active participation and interaction in the language classroom (Yáñez & Coyle (2011).

Given the fact that the IWB has been a fact of life in the present school contexts, current research appears to validate the view that L2 teachers need special training and skills in the effective use of IWBs in the language classroom. According to Schmid and Schimmack (2010), a major impediment to the utilization of technology such as IWBs in language classrooms is the fact that the language teachers are not sufficiently trained to integrate the technology into their language teaching and learning activities. A majority of the training sessions provided for language teachers on the integration of technology are usually one day workshops which neither accord the teachers sufficient time to learn nor offer follow-up services to the school and classroom levels. This view is supported by Schmid (2010) who investigated the new competencies that EFL teachers need to acquire in order to be able to use IWBs to develop their practice. The results of her study demonstrated that various competencies are required to integrate the technology into teaching: (a) the ability to design IWB-based materials which support opportunities for learner interaction with the whiteboard and with the learning content; (b) the appropriate management of interaction around IWBs in a way that ensures all learners are provided with opportunities to become actively involved; and (c) the ability to find the 'right balance' of technology use. This means that investment in good-quality teacher training is essential and especially pre-service language teacher education programs play a central role in enabling teachers to use the IWB technology towards a socio-cognitive approach to technology enhanced language teaching. On these grounds, it can be argued that training for IWB use should start in pre-service L2 teacher education programs and continue in in-service training programs as part of Continuing Professional Development (CDP).

Overall, the current literature on teachers' and students' opinions, attitudes and perceptions about the IWB use reveals that both students and teachers usually have positive reactions to this technology. The consensus view seems to be that although there is not any reference to specific improvements in the "linguistic outcomes" of students due to the use of the IBWs in the language classroom, this technology may have some potentials to promote students' and teachers' interest and motivation in L2 (DiGregorio & Sobel-Lojeski, 2010). The rapidly growing literature on the IWB use also indicates that L2 teachers need some competencies to acquire and training in order to integrate this technology in their language classrooms. In addition, there have been very few studies into learners' and teachers perspectives on the IWB technology in L2 teaching and learning in Turkey ever since MoNE (2010) embarked on the FATIH Project in order to "enhance opportunities" and since most private schools launched the IWB technology in their classrooms long ago. Finally, research reports and studies do not reveal any specific information about some factors such as gender, teaching experience and proficiency level, which the present study intends to address.

THE PURPOSE OF THE STUDY
This study was primarily conducted to investigate teachers' and students' perceptions of IWBs in the EFL classroom and to find out whether there are differences of perceptions in terms of some variables such as gender, proficiency level, hours of weekly IWB use, and years of teaching experience. Thus, the study was designed to address the following research questions:

1. What are the teachers' perceptions of IWBs in the English as a foreign language classroom?
2. What are the students' perceptions of IWBs in the English as a foreign language classroom?
3. Do students' perceptions of IWBs display differences according to their gender, level of language proficiency and hours of weekly IWB use?
4. Do teachers' perceptions of IWBs display differences according to their gender, years of teaching experience and hours of weekly IWB use?

In this study, it is expected that investigating teachers' and learners' perceptions of the IWB use in the EFL classroom will provide beneficial data for and shed more light on the effective use of this technology, which is now a fact of academic or school life in Turkey. By providing insights into the use of IWBs, the findings of this study should lead governments, school administrators, teachers and in-service trainers to make an assessment of the uses of this IWB technology installed in classrooms. It is also expected that the findings of this study will

provide teacher trainers in tertiary education with useful information regarding the training of pre-service language teachers before they embark on language teaching in schools.

METHODOLOGY

Research design
The present study was primarily carried out with a quantitative approach using a survey methodology. Two separate self-report questionnaires were administered to collect quantitative data about participating teachers' and students' perceptions of IWBs in the EFL classroom. However, the study also included qualitative data drawn from the EFL teachers who were interviewed to express their suggestions and comments by responding to open-ended questions. It can be stated that the study was carried out with a mixed-method design in which both quantitative and qualitative data were collected (Dörnyei, 2007; Mackey and Gass, 2005). Yet, the bulk of data in the study was quantitatively gathered.

Setting and participants
This study was conducted in a large private Anatolian high school in Ankara where IWBs are installed and operated by teachers in classrooms. Like most other private schools, it attached great importance to the study of foreign languages and included 13 hours of English lessons per week in its ninth-grade language curriculum. Since there was not preparatory English program in the high school, English lessons were conducted more intensively in the ninth-grade compared to other grades. Furthermore, English lessons were taught by non-native and native teachers of English (70.70% females and 29.30% males). Teachers used both traditional whiteboards and interactive whiteboards in their English lessons. In the use of IWBs, they mostly used software applications that came along with course books by some international publishers. Unlike most English teachers in public schools where IWBS are also installed, they did not have any resource limitations in terms of interactive whiteboard programs. Since there were only 35 teachers of English in the school based in Ankara, other teachers of English based in another branch of the private school were also asked to participate in the survey. Thus, the survey was sent to a total of 65 teachers working in two branches of a large private Anatolian high school. Since participation was voluntary, a total of 58 teachers opted to answer the survey, yielding an 89% response rate. On the other hand, the student participants of the study consisted of 164 fifteen-year-old ninth grade EFL students enrolled in the Ankara branch of a private Anatolian high school. 52.4% of them (N=86) were females and 47.6% of them (N=78) were males. The students were placed in their groups based on the results of an online placement test administered at the beginning of the academic year, and their proficiency levels ranged between A2 and C1 according to the CEFR level. After the school administrators' and coordinators' approval, the student survey was sent to 224 ninth-grade students. Since student participation was also voluntary, a total of 164 students agreed to answer the survey, yielding a 73% response rate. Table 1 presents more background information about the participating students and teachers.

Table 1: Background information about the participants

Students	Age	Frequency	Percentage	Level of English Proficiency[*]	Frequency	Percentage
	15	164	100	A2	68	41.5
				B1	44	26.8
				B2	37	22.6
				C1	15	9.1
	Total	164	100		164	100
Teachers	Age			Years of Teaching Experience		
	20-25	17	29.3	1-5	28	48.3
	26-30	12	20.7	6-10	15	25.9
	31-35	14	24.1	11-15	9	15.5
	36+	15	25.9	16+	6	10.3
	Total	58	100	Total	58	100

[*] Students took Oxford Placement Test (OPL) at the beginning of the term; they self-reported their CEFR levels based on the OPL results.

Instrument
The instruments for this study included two paper-based questionnaires about the students' and teachers' perceptions of the use of IWBs in the English as a foreign language classroom. Both questionnaires consisted of two parts. The first part of the student questionnaire included five questions that characterize them such as age,

gender, level of English proficiency, weekly hours of IWB use, and skills areas IWBs are used for. Similarly, the first part of the teacher questionnaire included five questions that characterize them such as age, gender, years of teaching experience, weekly hours of IWB use, and skills areas for which they use IWBs. The second part of the student questionnaire included 26 five-point Likert-scale items to measure the student's perceptions about four factors: **Perceived Learning Contribution, Motivation, Perceived Efficiency**, and **Perceived Negative Effects**. Likewise, the second part of the teacher questionnaire consisted of 25 five-point Likert-scale items to measure the teachers' perceptions about four factors: **Instructional Effects of IWBs, General Attitudes, Motivational Effects of IWBs,** and **Need for Training**. While preparing the instruments, the researcher reviewed similar studies that investigated the opinions, attitudes and perceptions of students and teachers in various domains (Moss, et al. 2007; Celik, 2012; Elaziz, 2008; Isman, Abanmy, Hussein and All-Saadany, 2012; Mathews-Aydinli & Elaziz, 2010; Türel, 2011; Türel & Johnson, 2012; Levy, 2002) and adapted a total of 30 items for each questionnaire. For example, some of the items were taken from Türel (2011) who designed a valid and reliable IWB student survey according to Davis' (1989) Technology Acceptance Model in order to assess the IWB use based on perceptions of students who have been taught with IWBs in real classroom settings.

After an experienced colleague's and two experts' opinions were taken for instrument validity, the student questionnaire was reduced to a 26-item scale and the teacher questionnaire to a 25-item one. The student's questionnaire was translated into Turkish and revised by a colleague so that the participating students would have no difficulty understanding the statements. To further improve the questionnaires, a pilot study was conducted with twenty-five tenth grade students in the aforementioned school context and fifteen senior pre-service English teachers in Hacettepe University English Language Teaching Department. This was followed by only slight revisions and rewording of some items in the teacher's questionnaire only. Since the statements in the questionnaire were designed to be rated using a five-point Likert scale, the student and teacher participants rated the items by choosing the responses among (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. The student's questionnaire contained nine "negatively-keyed" statements such as those of the "perceived negative effects" measures that were reverse coded to ensure consistency. Likewise, the teacher's questionnaire contained eight "negatively-keyed" statements such as those of the "instructional effects" and "need for training" measures that were also reverse coded to ensure consistency (Field, 2009). Consequently, the Cronbach's alpha reliability of the 26-item student questionnaire (after reverse-scoring the appropriate items) was 0.86 while the Cronbach's alpha reliability of the 25-item teacher questionnaire (after reverse-scoring the appropriate items) was 0.88. These high alpha values indicated good internal consistency of the items in the research instruments.

Data collection and analysis
This study was conducted in the 2012-2013 academic year spring semester in a large private Anatolian high school based in Ankara. After the school administrators' and coordinators' approval, a total of 164 student participants enrolled in ninth grade and taking 13 hours of English lessons in their intensive English curriculum volunteered to participate in the study. The sample was not ethnically diverse. All the student participants were Turkish. The survey was anonymous, and without any consultation among themselves the students completed it in fifteen minutes during one of their English classes. The data from the teacher participants were collected from 58 teachers of English who were employed in two branches of a private school, but the bulk of data came from the teachers based in Ankara branch of the school. The teacher survey was also anonymous, and native and non-native teachers opted to complete and return the questionnaire. Although the study used the questionnaires as primary data collection tools, interviews were also conducted with teachers who were actively used IWBs in their English lessons. Thus, the data gathered from interviews were also utilized to support the analyses of the quantitative data.

Data analysis was conducted to address the research questions of the present study. Data gathered from the questionnaires was fed into the computer and analyses were carried out using SPSS (Statistical Package for the Social Sciences) 21, a comprehensive computer program used to help researchers perform statistical analysis quickly and accurately. In order to obtain a model for presenting the results of the participants' perceptions of IWB use, the perfect scores of teachers and students were exclusively summed. Descriptive analyses such as frequency and mean were obtained to characterize the collected data. Other statistical analysis tests conducted for the study consisted of an independent-samples t-test, the one-way analysis of variance (one-way ANOVA) and a post-hoc test. The independent-samples t-test is employed when the two groups or sets of scores whose means are being compared are independent of each other (Mackey and Gass, 2005; Ravid, 2011; Field, 2009). As an extension of a *t*-test for independent samples, one-way ANOVA is used when there are two or more independent groups (Ravid, 2011; Field, 2009). The post-hoc test, which follows an analysis of variance, is used to determine which groups are significantly different from each other. In other words, it tests all of the possible

pairings of groups for statistical differences (Mackey and Gass, 2005; Ravid, 2011; Field, 2009; Larson-Hall, 2010).

The independent-samples t-tests were conducted to compare female and male students' and teachers' perceptions of IWBs while one-way ANOVA was used to find out whether there was any statistically significant difference of perceptions among student participants according to their language proficiency level. One-Way ANOVA was used to measure the proficiency level and hours of weekly IWB use instead of t-test because there were four options of proficiency levels being compared. This analysis of variance was further followed by a post-hoc comparison in which Tuckey's post-hoc test was conducted to find out exactly where the significant differences between groups existed. One-way ANOVA was also used to find out whether there was any statistically significant difference of perceptions among EFL teachers according to their years of teaching experience, age and hours of weekly IWB use. All statistical tests conducted for this study were assessed at the 0.05 level of significance.

RESULTS

This section presents the results of the current study in terms of descriptive and inferential statistics as well as a discussion and analysis of the findings. A short presentation of the participants' opinions is also given at the end of the section. It also compares the findings with the research studies conducted previously.

An exclusive summation of the perfect scores of participating teachers and students was first made in order to obtain a model for presenting the results of teachers' and students' perceptions of IWBs in the EFL classroom. Then, their perfect scores were divided into three categories to get the appropriate cut-off points for each of them. Table 2 presents the perfect scores for students' overall perceptions of IWBs based on the four constituent factors, the obtained main scores and mean scores along with percentages for high, moderate and low perceptions for each dimension and the overall perception of IWB use. The perceptions of IWB use were considered as 'low' if they were within the low score category of each variable's total range, 'moderate' if they were within the middle score category of the total range, and 'high' if they were within the high score category of the total range.

Table 2: Main scores, mean scores and the self-developed cut-off points for the model

Groups	Variables	Perfect Scores	Cut-off points for Main Scores			Cut-off points for Mean Scores		
			Low	Moderate	High	Low	Moderate	High
Teachers	Instructional effects of IWBs	1-55	1-18 0.0%	19-36 12.1%	37-55 87.9%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
	General attitude	1-40	1-13 1.7%	14-26 13.8%	27-40 84.5%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
	Motivational effects	1-20	1-6 0.0%	7-13 27.6%	14-20 72.4%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
	Need for training	1-10	1-3 0.0%	4-7 91.4%	8-10 8.6%	1-2.30 0.0%	2.31-3.50 50.%	3.51-4.66 0.0%
	Overall perception	1-125	1-42 0.0%	43-84 13.8%	85-125 86.2%	1-2.30 0.0%	2.31-3.50 0.0%	3.51-4.66 100.0%
Students	PLC*	1-25	1-8 0.0%	9-17 13.4%	18-25 86.6%	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 100.0%
	Motivation	1-55	1-18 .6%	19-36 17.7%	37-55 81.7%	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 90.90%
	PE*	1-25	1-8 1.2%	9-17 34.8	18-25 64.0	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 80%
	PNE*	1-25	1-8 2.4	9-17 66.5	18-25 31.1%	1-2.25 0.0%	2.26-3.50 40%	3.51-4.67 0.0%
	Overall perception	1-130	1-45 0.0%	46-89 25.6	90-130 74.4%	1-2.25 0.0%	2.26-3.50 0.0%	3.51-4.67 100.0%

* PLC, perceived learning contribution; PE, perceived efficiency; PNE, perceived negative effect

The item-based analyses of the four factors in both groups were conducted to statistically depict a comprehensive picture of the participants' perceptions on the perceived effects of IWBs on successful language learning. That is, the general mean scores for each of the four dimensions used to measure the teachers' and

student's perceptions on the effectiveness of IWB use in language learning were obtained by summing the participants' ratings for the corresponding items within four dimensions. Drawing upon the information given on the characteristics of factors reflecting teachers' and students' perceptions of IWBs, the results of the descriptive analyses of the participants' self-report on the use of IWBs are presented below based on the order of research questions.

Descriptive statistics
Teachers' perceptions of IWBs in the EFL classroom
Most of the participants were females (70.7%). The results of descriptive analyses for teachers revealed an excellent consistency in the mean scores of the items within all four subscales except for items 6 (M=3.67, SD=.68) and 25 (M=1.91, SD=0.77). As the mean scores for all items fall within the highest category of the self-developed cut-off points for IWB use, except for item 25 and that 96% of the participants positively rated the statements, it can be concluded that there was a general consensus among EFL teachers on the benefits of IWB use in language teaching. Moreover, item 3(*Using IWBs makes it easier to reach different sources and display them to the whole class immediately*) received the highest mean score (M=4.66, SD=.47) while the lowest mean score (M=1.91, SD=.77) was obtained for item 25(*If I do not get sufficient training, I do not feel comfortable with using IWBs in the classroom*), a reverse coded item, which marks the high proportion (81%) of consensus and agreement on the statement.(Table 3).

Table 3: Descriptive statistics for teachers' perceptions of the IWB use in the EFL classroom

Items and Item Descriptions	1	2	3	4	5	Mean	SD
I. Instructional effects of IWBs							
1. Using the IWB resources reduces the time I spend writing on the board.	0	0	2	29	27	4.43	.56
2. When using IWBs in the classroom, I spend more time for the preparation of the lesson.*	0	0	14	28	16	4.03	.72
3. Using IWBs makes it easier to reach different sources and display them to the whole class immediately.	0	0	0	20	38	4.66	.47
4. IWBs are beneficial for saving and printing the materials generate during the lesson.	0	1	12	26	19	4.09	.77
5. I can give explanations more effectively with the use of IWBs.	0	0	9	34	15	4.10	.64
6. With the help of using the IWB, I can easily control the whole class.	0	0	26	25	7	3.67	.68
7. I think IWBs can be a good supplement to support English teaching.	0	0	1	27	30	4.50	.53
8. Using IWBs makes me a more efficient teacher.	0	0	8	31	19	4.19	.66
9. Using IWBs makes it easier for an English teacher to review, re-explain, and summarize the subject.	0	0	3	34	21	4.31	.56
10. I believe IWB is a useful technology for English teachers to learn.	0	0	2	34	22	4.34	.54
11. Using IWB makes the English lessons more interactive.	0	0	2	36	20	4.31	.53
II. General attitudes							
12. I like using IWB technology in my English lessons.	0	0	3	27	28	4.43	.59
13. I feel uncomfortable using IWBs in front of my students.*	0	1	6	28	23	4.25	.71
14. I have positive attitudes toward the use of IWBs in language teaching.	0	0	1	25	32	4.53	.53
15. I have negative attitudes toward the use of IWBs in language teaching.*	0	0	4	25	29	4.43	.62
16. I do not think my students are ready for this technology.*	0	0	3	14	41	4.65	.57
17. What I do in class with traditional methods is sufficient for teaching English.*	0	0	6	25	27	4.36	.66
18. I am not the type to do well with IWB-based applications.*	0	0	2	31	25	4.39	.56
19. There is no difference between my use of a traditional board and an IWB in terms of teaching techniques and methods.*	0	1	5	28	24	4.29	.70
III. Motivational effects of IWBs							
20. I think IWBs make learning more enjoyable and more interesting.	0	0	3	30	25	4.38	.58
21. I can keep my students' attention longer with the help of IWB technology.	0	1	10	27	20	4.14	.76
22. I think IWBs increase the interaction and participation of the	0	1	2	31	24	4.34	.63

	students.						
23.	I think my students are more motivated when I use an IWB in my lessons.	0	0	9	29	20	4.19	.68
IV.	*Need for training*						
24.	I believe that training is required to teach with IWB technology.	0	0	2	27	29	4.47	.56
25.	If I do not get sufficient training, I do not feel comfortable with using IWBs in the classroom.*	18	29	9	2	0	1.91	.77

* Asterisks indicate negatively-worded items in the scale.

The instructional effects of IWBs, general attitude, and motivational effects dimensions received positive ratings (100%) whereas the need for training item received a negative or neutral rating (50%). Additionally, the percentages analyses showed that 87.5% of the participants agreed with instructional effect dimension, 93.12% with general attitude, 89% with motivational effects dimension, and 50% with need for training dimension. The reason why the need for training dimension reveals low percentage is the fact that item 25 is a negatively-keyed statement and its low percentage, indeed, represents positive attitude regarding the necessity of training. Totally, 80% of teachers agreed with the overall perceptions of IWBs in EFL classrooms. Figure 1 diagrammatically illustrates total mean scores of teachers' perceptions of IWB use regarding overall perception and the four designated dimensions.
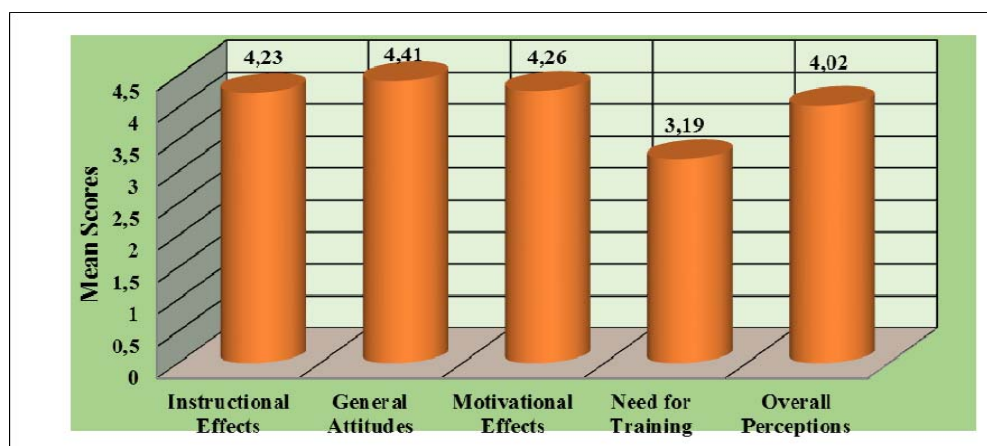
Figure 1: Teachers' perceptions of IWB use in the EFL classroom

The results of descriptive analysis for Teachers' Hours of Weekly IWB use revealed that the highest mean scores were ascribed to female participants (*M*=2.66, *SD*=1.15) .This suggests that females have higher perceptions of using IWBs than males. Moreover, the results indicated that the highest percentages of females (31.7%) fall within '11 hours and more' group and 35.3% of males in '1-2 hours' group, suggesting that female teachers spend more hours on using IWBs than males. (Table 4).

Table 4. Descriptive statistics for teachers' hours of weekly IWB use

Gender	Hours of weekly IWB use	N	F	%	Mean	SD
	1-2 hours		9	22.0		
Female	3-5	41	9	22.0	2.66	1.15
	6-10		10	24.4		
	11 hours and more		13	31.7		
	1-2 hours		6	35.3		
Male	3-5	17	2	11.8	2.41	1.22
	6-10		5	29.4		
	11 hours and more		4	23.5		
	1-2 hours		15	25.9		
Total	3-5	58	11	19.0	2.59	1.17
	6-10		15	25.9		
	11 hours and more		17	29.3		

Students' perceptions of IWBs in the EFL classroom
The results of descriptive analyses indicated that 52.4% of the participants were females (N=86) and that the mean scores obtained for the items were not consistent within the scale (Table 5). However, based on the self-developed cut-off points mentioned above, 80.77% of the mean scores received for all items were found to be fallen within the highest category of the self-developed cut-off points for IWB use. As in the case of teachers, most of the students demonstrated greater enthusiasm and interest for using IWB technology in learning English. The highest mean score was received for item 10 (*It seems difficult for me to use IWBs*), a reverse-coded item, indicating that a great majority of students disagreed with the statement. The lowest mean score, on the other hand, was ascribed to item 7(*Sometimes deficiencies of the IWB screen and sunlight in the classroom make it difficult to see the things on the IWB*), which is also a reverse-coded item, suggesting that most of the students agreed with the statement.

Table 5: Descriptive statistics for students' perceptions of the IWB use in the EFL classroom

Items and Item Descriptions	1	2	3	4	5	Mean	SD
I. *Perceived learning contribution*							
1. I learn more when my teacher uses the whiteboard.	2	5	28	85	44	4.00	.82
2. It is easier to understand the lesson when my teacher uses an IWB.	0	4	20	92	48	4.12	.70
3. Using audio and visual materials with IWBs helps me understand the lesson better.	1	3	10	91	59	4.24	.70
4. I find the opportunity to learn from different sources with the use of IWBs.	4	7	19	88	46	4.01	.89
5. IWB use makes it easier for me to remember what I learned in class	3	14	38	79	30	3.73	.92
II. *Motivation*							
9. I like going to the front of the class to use the IWB.	3	15	32	70	44	3.84	.98
10. It seems difficult for me to use IWBs.*	1	3	4	33	123	4.67	.67
11. I prefer lessons that are taught with an IWB.	1	10	26	87	40	3.95	.83
12. It makes me uncomfortable when my work is shown to the whole class on the IWB.*	19	19	38	51	37	3.41	1.27
13. I concentrate better when my teacher uses an IWB.	5	12	39	74	34	3.73	.97
14. I get to join in lessons more when my teacher uses an IWB.	2	13	42	71	36	3.77	.92
15. IWBs make learning English more interesting and exciting.	10	5	28	80	41	3.84	1.03
16. It is easier to keep my attention when an IWB is used during the lesson.	3	16	41	74	30	3.68	.94
17. Use of an IWB makes it easier for me to be motivated during the lesson.	7	17	33	78	29	3.64	1.02
18. IWB use increases my interest in the English lesson.	9	14	29	81	31	3.68	1.05
19. If my English teachers use IWB more often, I will enjoy lessons more.	6	18	31	75	34	3.69	1.03
III. *Perceived efficiency – PE*							
6. IWBs make the teachers' drawings and diagrams easier to see.	8	10	38	65	43	3.76	1.06
21. The lessons become more organized when an IWB is used.	5	11	37	80	31	3.74	0.94
22. Using an IWB saves time and the lesson moves smoothly.	7	11	31	76	39	3.79	1.02
25. There is no difference between my English teacher's use of a traditional board and an IWB in terms of teaching techniques and methods.*	24	29	28	55	28	3.20	1.32
26. I think there is not much difference between an IWB and a normal whiteboard.*	9	18	16	67	54	3.84	1.15
IV. *Perceived negative effects – PNE*							
7. Sometimes deficiencies of the IWB screen and sunlight in the classroom make it difficult to see the things on the IWB.*	82	36	15	19	12	2.04	1.31
8. IWBs often break down and recalibration causes a waste of time.*	41	31	28	44	20	2.82	1.38
20. When my teacher uses an IWB, I cannot keep up with the lesson because the pace of the lesson.*	20	27	19	63	35	3.40	1.31
23. During IWB use, there is a lot of noise in class.*	15	20	20	78	31	3.54	1.19
24. IWB was exciting at the beginning but not anymore.*	12	17	27	46	62	3.78	1.25

* Asterisks indicate negatively-keyed items in the scale.

Given the self-developed cut-off points, the perceived learning contribution, motivation, and perceived efficiency dimensions and overall perceptions of IWBs received positive ratings (100%, 90.90%, 80 %, and 80.77 respectively), whereas the perceived negative effects dimension was rated negatively or moderately (40%), emphasizing the positive aspects of IWB technology as valuable instructional tool in learning English as a foreign language. Furthermore, the results of percentages analyses indicated that 80.75% of the students agreed with perceived learning contribution, 69.45% with motivation dimension, 66% percent with perceived efficiency dimension, and 50% with perceived negative effects dimension. All in all, 67% of students agreed with overall perceptions of IWB technology. Figure 2 shows the total mean scores for the four dimensional model of factors affecting students' perceptions of IWB use.
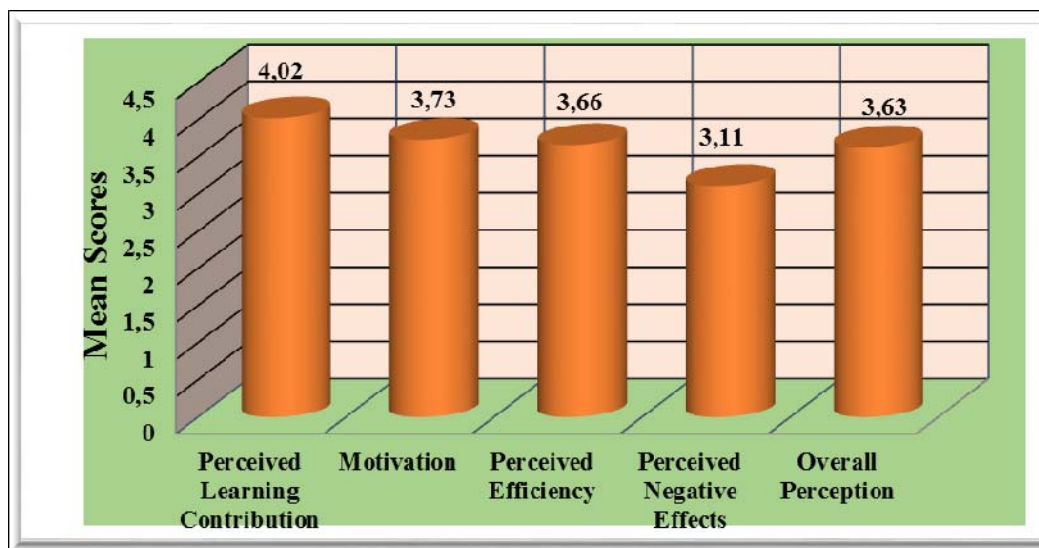
Figure 2: Students' perceptions of IWB Use in the EFL classroom

Unlike teachers' group, the results of descriptive analysis for students' Hours of Weekly IWB Use reported the highest mean score for female participants (M=2.66, SD=1.15), suggesting that male students are more interested in using IWBs than females. Surprisingly, the results indicated that 44.2 % of females and 52.6% of males belong to the same group, i.e., '6-10 hours' group (Table 6).

Table 6: Descriptive results for students' hours of weekly IWB use

Gender	Hours of weekly IWB use	N	F	%	Mean	SD
	1-2 hours		2	2.3		
Female	3-5	86	18	20.9	3.07	.79
	6-10		38	**44.2**		
	11 hours and more		28	32.6		
	1-2 hours		1	1.3		
Male	3-5	78	9	11.5	3.21	.69
	6-10		41	**52.6**		
	11 hours and more		27	34.6		
	1-2 hours		3	1.8		
Total	3-5	164	27	16.5	3.13	.75
	6-10		79	**48.2**		
	11 hours and more		55	33.5		

As for the English proficiency level of students, the results showed that a substantial number of students (41.5%) belong to the beginner's level (A2) while only 9.1% fall within C1 group (Table 7).

Table 7: Percentages of students according to their level of English proficiency

	English Proficiency Level	F	%
Students	A2	68	41.5
	B1	44	26.8
	B2	37	22.6
	C1	15	9.1

Inferential Statistics
Differences of students' perceptions of IWBs
This part presents the results of data analysis regarding whether there are any statistically significant differences of students' perceptions of IWBs according to their gender, level of language proficiency, and hours of weekly IWB use.

The results of descriptive analysis showed differences in the mean scores of males and females across the perception dimensions measured in the study. As shown in Table 8, females had higher mean scores for *perceived learning contribution* and *perceived negative effects* dimensions while males had higher ratings for the *perceived efficiency* and *motivation* dimensions. Additionally, compared with females, males exhibited a higher rating for overall perception of IWB use. However, the independent-samples t-test revealed that there was statistically no significant difference between female (*N*=86) and male (*N*=78) students because the *p*-value for all variables was greater than the level of significance set at 0.05.

Table 8: Students' perceptions of IWB use by gender

	Group Statistics				t-test		
Variables	Gender	N	Mean	SD	t	df	Sig.(two-tailed)
Perceived learning contribution	Female	86	20.16	3.01	.286	162	.776
	Male	78	20.03	3.13			
Motivation	Female	86	41.33	6.55	-1.163	162	.246
	Male	78	42.51	6.49			
Perceived efficiency	Female	86	18.29	3.25	-.201	162	.841
	Male	78	18.40	3.55			
Perceived negative effects	Female	86	15.76	3.76	.539	162	.591
	Male	78	15.44	3.83			
Overall perception	Female	86	95.53	12.93	-.419	162	.676
	Male	78	96.37	12.58			

*Significant at 0.05 level
** Significant at 0.01 level

The results of One-way ANOVA test demonstrated that there were statistically significant differences between participants according to their language proficiency level in the two dimensions of *motivation*, *F* (3,160) = 2.818, p=0.041,p<0.05, and *perceived efficiency*, *F* (3,160= 3.499, p=0.017, p< 0.05. However, as shown in Table 9, no significant difference was found among participants with respect to their proficiency level in the *perceived learning contribution* dimension, *F* (3,160= .362, p=0.780, p> 0.05, *perceived negative effects* dimension, *F* (3,160= 1.210, p=0.308, p>0.05, and overall perception of IWB use, *F* (3,160= 2.233, p=0.086, p> 0.05. Furthermore, the results of 'Effect Size' statistics (Cohen, 1988; Larson-Hall, 2010; Field, 2009) based on the 'Eta Square' value (η^2) revealed a slight significant difference for *motivation* dimension ($\eta^2 = 0.050$, $\eta^2 < 0.59$) and a moderate significant difference ($\eta^2 = 0.061$, $\eta^2 > 0.59$) between groups.

Table 9: Students' perceptions of IWB use according to their level of language proficiency

	Group Statistics				ANOVA			
Variables	Proficiency level	N	Mean	SD	df	F	Sig.	η^2
Perceived learning contribution	A2	68	20.29	2.81				
	B1	44	20.14	3.33				
	B2	37	19.65	3.06	3;160	.362	0.780	-
	C1	15	20.20	3.48				
Motivation	A2	68	42.47	5.97				
	B1	44	43.00	6.51				
	B2	37	39.22	6.58	3;160	2.818	**0.041***	0.050
	C1	15	42.60	7.67				

	A2	68	17.69	3.33				
	B1	44	19.70	2.79				
Perceived efficiency	B2	37	18.05	3.30	3;160	3.499	**0.017***	0.061
	C1	15	18.00	4.48				
	A2	68	15.22	3.70				
	B1	44	16.50	3.44				
Perceived negative effects	B2	37	15.19	3.97	3;160	1.210	0.308	-
	C1	15	15.73	4.59				
	A2	68	95.68	11.38				
	B1	44	99.34	12.18				
Overall perception	B2	37	92.11	13.72	3;160	2.233	0.086	
	C1	15	96.53	15.84				

*Significant at 0.05 level
** Significant at 0.01 level

Furthermore, as the assumption of homogeneity of variances was met in all four designated dimensions, Tuckey's post-hoc test was conducted to find out exactly where the significant differences between groups exist. The post hoc comparisons using the Tuckey's HSD test revealed that participants with B1 and B2 language proficiency level differed significantly in motivation dimension, and those with A2 and B1 proficiency level differed significantly in their perceptions of perceived efficiency dimension from other groups tested. (Table 10).

Table 10: Post hoc test for language proficiency level and IWB use

Tuckey's HSD		Multiple Comparisons			
Variables	(I) English Level	(J) English Level	Mean Difference (I-J)	Std. Error	Sig.
Motivation	A2	B1	-.52	1.24	.974
		B2	3.25	1.31	.067
		C1	-.12	1.83	1.000
	B1	A2	.52	1.24	.974
		B2	3.78*	1.43	**.045***
		C1	.40	1.92	.997
	B2	A2	-3.25	1.31	.067
		B1	-3.78*	1.43	**.045***
		C1	-3.38	1.96	.317
	C1	A2	.12	1.83	1.000
		B1	-.40	1.92	.997
		B2	3.38	1.96	.317
Perceived efficiency	A2	B1	-2.01*	.64	**.011***
		B2	-.36	.67	.950
		C1	-.30	.94	.988
	B1	A2	2.01*	.64	**.011***
		B2	1.65	.73	.119
		C1	1.70	.99	.317
	B2	A2	.36	.67	.950
		B1	-1.65	.73	.119
		C1	.05	1.01	1.000
	C1	A2	.30	.94	.988
		B1	-1.70	.99	.317
		B2	-.05	1.01	1.000

*. The mean difference is significant at the 0.05 level.

Similarly, the results of One-way ANOVA test indicated that there were statistically significant differences between participants according to their hours of weekly IWB use in the two dimensions of *motivation*, F (3,160) = 4.253, p=0.006,p<0.05, and *perceived efficiency*, F (3,160)= 4.177, p=0.007, p< 0.05, and *overall perception* ,F (3,160)= 4.411, p=0.005, p< 0.05. However, as shown in Table 11, no significant difference was found among participants in relation to their hours of weekly IWB use in the *perceived learning contribution* dimension, F (3,160= 1.923, p=0.128, p>0.05, and *perceived negative effects* dimension, F (3,160= .871, p=0.458, p>0.05.

Furthermore, the results of 'Effect Size' statistics (Cohen, 1988; Larson-Hall, 2010; Field, 2009) based on the 'Eta Square' value (η^2) revealed a moderate significant differences for *motivation* dimension ($\eta^2 = 0.070$, $\eta^2 > 0.59$), *perceived efficiency* ($\eta^2 = 0.072$, $\eta^2 > 0.59$) and *overall perception* ($\eta^2 = 0.070$, $\eta^2 > 0.59$).

Table 11: Students' perceptions of IWB use according to their hours of weekly use

Variables	Hours of Weekly IWB use	N	X̄	SD	df	F	Sig.	η^2
Perceived learning contribution	1-2 hours	3	22.33	1.528				
	3-5	27	21.07	2.601				
	6-10	79	20.00	2.944	3;160	1.923	.128	-
	11 hours and more	55	19.64	3.385				
Motivation	1-2 hours	3	3	47.67				
	3-5	27	27	45.19				
	6-10	79	79	41.53	3;160	4.253	**.006***	0.070
	11 hours and more	55	55	40.47				
Perceived efficiency	1-2 hours	3	3	17.67				
	3-5	27	27	20.30				
	6-10	79	79	18.22	3;160	4.177	**.007***	0.072
	11 hours and more	55	55	17.60				
Perceived negative effects	1-2 hours	3	3	16.33				
	3-5	27	27	16.11				
	6-10	79	79	15.86	3;160	.871	.458	-
	11 hours and more	55	55	14.95				
Overall perception	1-2 hours	3	3	104.00				
	3-5	27	27	102.67				
	6-10	79	79	95.61	3;160	4.411	**.005***	.076
	11 hours and more	55	55	92.65				

Furthermore, as in the case of students' proficiency level, the post hoc comparisons using the Tuckey's HSD test revealed that the main differences existed largely between '3-5 hours' group and '11 hours and more' in all significant dimensions and overall perception while groups '3-5' and '6-10' differed significantly from each other in perceived efficiency dimension (Table 12).

Table 12: Post hoc test for hours of weekly IWB use and IWB use perceptions

Tuckey's HSD	Multiple Comparisons				
Variables	(I) Hours of Weekly IWB Use	(J) Hours of Weekly IWB Use	Mean Difference (I-J)	Std. Error	Sig.
	1-2 hours	3-5	2.48	3.86	.918
		6-10	6.13	3.73	.357
		11 hours and more	7.19	3.76	.227
	3-5	1-2 hours	-2.48	3.86	.918
		6-10	3.65	1.41	.052
Motivation		11 hours and more	**4.71***	1.49	**.010***
	6-10	1-2 hours	-6.13	3.73	.357
		3-5	-3.65	1.41	.052
		11 hours and more	1.05	1.11	.778
	11 hours and more	1-2 hours	-6.13	3.73	.357
		3-5	-3.65	1.41	.052
		6-10	1.05	1.11	.778
	1-2 hours	3-5	-2.63	2.00	.557
		6-10	-.54	1.93	.992
Perceived efficiency		11 hours and more	.06	1.95	1.000
	3-5	1-2 hours	2.63	2.00	.557
		6-10	**2.08***	.73	**.026***

		11 hours and more	**2.69***	.77	**.004***
	6-10	1-2 hours	.54	1.93	.992
		3-5	**-2.08***	.73	**.026***
		11 hours and more	.61	.57	.712
	11 hours and more	1-2 hours	-.06	1.95	1.000
		3-5	**-2.69***	.77	**.004***
		6-10	-.61	.57	.712
	1-2 hours	3-5	1.33	7.51	.998
		6-10	8.39	7.26	.656
		11 hours and more	11.34	7.32	.411
	3-5	1-2 hours	-1.33	7.51	.998
		6-10	7.05	2.75	.054
Overall		11 hours and more	**10.01***	2.90	**.004***
perception	6-10	1-2 hours	-8.39	7.26	.656
		3-5	-7.05	2.75	.054
		11 hours and more	2.95	2.16	.525
	11 hours and more	1-2 hours	-11.34	7.32	.411
		3-5	**-10.01***	2.90	**.004***
		6-10	-2.95	2.16	.525

*. The mean difference is significant at the 0.05 level.

Differences of teachers' perceptions of IWBs

This part presents the results of data analysis regarding whether there are any statistically significant differences of teachers' perceptions of IWBs according to their gender, years of teaching experience, and hours of weekly IWB use.

The results of the independent-samples t-test revealed that there were not any statistically significant differences between female (N=41) and male (N=17) teachers because the p-value for all variables was greater than the level of significance set at 0.05. However, the examination of group statistics suggested differences between males and females (Table 13) across the four dimensions measured. Female teachers had higher ratings for the two dimensions of *instructional effects* and *motivational effects*, whereas males had higher ratings for the dimensions of *general attitude* and *need for training*. Furthermore, female participants had higher mean scores in overall perception of IWB use.

Table 13: Teachers' perceptions of IWB use by gender

Variables	Group Statistics				t-test		
	Gender	N	Mean	SD	t	df	Sig.(two-tailed)
Instructional effects	Female	41	41.82	4.39	.996	56	.323
	Male	17	40.58	4.12			
General attitude	Female	41	30.12	4.15	-.919	56	.362
	Male	17	31.23	4.30			
Motivational effects	Female	41	14.97	1.96	1.358	56	.180
	Male	17	14.11	2.66			
Need for training	Female	41	9.78	2.35	-.301	56	.764
	Male	17	10.00	2.91			
Overall perception	Female	41	96.70	8.98	.291	56	.772
	Male	17	95.94	9.41			

A one-way ANOVA test was conducted to find out whether EFL teachers' teaching experience does have any impact on their perceptions of IWB use. The results showed no significant differences for the participants' perceptions in relation to their years of teaching experience. Even though the participants did not differ significantly in their perceptions, as indicated in Table 14, the mean scores for experience group of '11-15' in two dimensions of *general attitude* and *motivational effects*, for '6-10' group in *instructional effects dimension*, and for '1-5' group in *need for training* dimension were higher than other groups. Moreover, EFL teachers with 11-15 years of teaching experience had a higher mean score for overall perception of IWB technology use in the EFL classroom. This means that teachers with more years of teaching experience reported more favorable perceptions of IWB use than less experienced teachers.

Table 14: Years of teaching experience and IWB use perceptions

Variables	Years of Teaching Experience	N	Mean	SD	df	F	Sig.
Instructional effects	1-5 years	28	41.35	4.61			
	6-10 years	15	42.26	3.19			
	11-15 years	9	41.22	5.01	3;54	.313	.816
	16 years and above	6	40.33	5.00			
General attitude	1-5 years	28	29.78	3.76			
	6-10 years	15	31.06	3.99			
	11-15 years	9	31.88	6.03	3;54	.728	.540
	16 years and above	6	29.83	3.65			
Motivational effects	1-5 years	28	14.53	2.51			
	6-10 years	15	14.66	1.95			
	11-15 years	9	15.44	1.74	3;54	.380	.768
	16 years and above	6	14.66	2.16			
Need for training	1-5 years	28	10.10	2.18			
	6-10 years	15	9.73	2.81			
	11-15 years	9	9.44	3.00	3;54	.217	.884
	16 years and above	6	9.50	2.88			
Overall perception	1-5 years	28	95.78	8.62			
	6-10 years	15	97.73	8.57			
	11-15 years	9	98.00	10.09	3;54	.337	.799
	16 years and above	6	94.33	12.01			

*Significant at 0.05 level
** Significant at 0.01 level

By the same token, a one-way ANOVA test was conducted to find out whether or not EFL teachers' perceptions of IWB use differ with respect to their hours of weekly IWB use. The results showed no significant difference in the participants' perceptions in relation to their hours of weekly IWB use. As indicated in Table 15, however, the results of group statistics reported high mean scores for '3-5 hours' group in two dimensions of *instructional effects of IWB use* (*M*=42.81, *SD*=4.44), *general attitude* (*M*=5.00, SD= 1.50), and *motivational effects* (*M*=15.36, *SD*=1.50), and for '11 hours and more' group in *need for training* dimension (*M*=6.64, *SD*=.93). Additionally, the highest mean score was observed for '11 hours and more' group in *overall perceptions of IWB use* (*M*=94.64, *SD*=10.16).

Table 15: Hours of weekly IWB use and IWB perceptions

Variables	Hours of Weekly IWB Use	N	Mean	SD	df	F	Sig.
Instructional effects	1-2 hours	15	40.33	3.24			
	3-5 hours	11	**42.81**	4.44			
	6-10 hours	15	40.60	3.77	3;54	1.153	.336
	11 hours and more	17	42.35	5.32			
General attitude	1-2 hours	15	4.49	1.16			
	3-5 hours	11	**5.00**	1.50			
	6-10 hours	15	3.18	.82	3;54	.426	.735
	11 hours and more	17	4.35	1.05			
Motivational effects	1-2 hours	15	14.40	2.87			
	3-5 hours	11	**15.36**	1.50			
	6-10 hours	15	14.80	1.78	3;54	.452	.297
	11 hours and more	17	14.52	2.34			
Need for training	1-2 hours	15	6.26	.88			
	3-5 hours	11	6.27	.64			
	6-10 hours	15	6.26	.79	3;54	1.260	.297
	11 hours and more	17	**6.64**	.93			

Overall perception	1-2 hours	15	90.93	8.72			
	3-5 hours	11	94.00	9.40			
	6-10 hours	15	92.53	6.04	3;54	.244	.865
	11 hours and more	17	**94.64**	10.16			

Results of qualitative data

The quantitative data reported in the above sections were based on the organized statistics from two five-point Likert questionnaires administered to EFL students and teachers. By means of convenient sampling technique, the researcher also conducted interviews with some participating teachers in Turkish and asked them open-ended questions in order to give them the opportunity to express themselves fully. The following spontaneous comments and suggestions they made might illustrate a variety of opinions held by the EFL teachers about the use of IWBs in English lessons.

- *IWB must be used as teaching tool, not as a means of entertaining students. In order to use it effectively, the teachers need training for technical issues and programs that come with the course books.*
- *Sometimes PCs connected to IWBs break down. This prevents us from using them for several days. This is a problem for teachers. We need technical support all the time.*
- *I graduated from the university last year and began to use the IWB here. I did not get training for IWB use in the department at the university. So I got special training for the IWB at the beginning of the term, but it was not enough.*
- *IWBs and Table PCs should be connected so that students can copy and paste the teacher's words on the board.*
- *IWBs are good at taking students' attention and motivating students. There is more student participation in the class when I use the IWB.*
- *I don't know if the traditional boards will be replaced with IWBs, but to me IWBs will always be available in schools.*
- *I wasn't satisfied with the training I got from the IWB manufacturer or seller because they didn't show us how to use the software that came with the course books. But I can manage the course of my English lessons more easily now. Because we attended workshops by the publishers of the books we use…*
- *IWBs must be used all around the country. But schools should also provide the necessary software that comes with course books.*
- *Schools should have suitable course books for IWBs. I mean the material should be uploadable to the board, so that teachers can use the books easily.*
- *While using videos on IWBs, optional subtitles should also be available.*
- *It is not necessary to use the IWB all the time. But we have to use it especially for listening skills because there is no other choice to make students listen to the dialogs and conversations.*

The above comments and suggestions give a general impression of teachers' comments and suggestions about the use of IWBs in their English classes. Despite some technical problems they reported that they encountered in utilizing the IWB technology, the interview sessions indicated that all teachers support the use of IWB technology in English lessons and emphasize their training need for IWBs, especially with reference to software that comes with the course books by publishers. In sum, these findings are in line with those of Yang and Teng's (2014) study that revealed that using IWBs effective requires L2 teachers to master IWB technical skills as well as a professional knowledge of attaining language teaching goals.

DISCUSSION

The above findings are discussed here to find answers to the research questions which were the objectives of this study. The percentage and mean scores revealed that both teachers and students have positive perceptions of the overall use of IWBs and their effectiveness in EFL classrooms. However, the results of t-test and One-way ANOVA tests for teachers showed no significant difference in participants' perceptions of IWBs with respect to their gender and years of experience. This can be attributed to the fact that 80% of the teachers agreed with overall perceptions of IWBs and that 96 % of their ratings fall within high level perceptions of IWBs which, in turn, puts much weight on the homogeneity of variances in the ratings of the respondents. This implies that teachers predominantly are aware of the instructional and motivational advantages of IWBs. Put another way, they largely perceive that IWBs are time-saving facilities which help them have access to a wide variety of resources instantly during the teaching process, elaborate effectively on the teaching materials, develop self-confidence and enhance their self-efficacy, making them more efficient language teachers while having adequate

control of their classes. Overall, EFL teachers feel more comfortable with the IWB technology and advocate its use while rejecting the idea that neither the teachers nor students are ready to make use of the IWB technology in EFL classroom. Furthermore, it is perceived that using IWBs provides enjoyable atmosphere for language learning, motivates students towards getting the most out of their learning through enhanced interaction.

Teachers' ratings for the two statements in the dimension of need for training indicated that 81% of participants need IWB training, which means that they will not feel comfortable unless they receive sufficient training in using the IWB technology. This goal can be achieved through attending IWB training workshops as part of Continuing Professional Development (CDP). This finding is largely in line with the findings of several studies on IWB (Slay et al., 2008; Türel & Johnson, 2012; Celik, 2012; Glover & Miller, 2001; Smith et al., 2005; Somyürek, Atasoy, and Özdemir, 2009; Mathews-Aydinli & Elaziz, 2010). According to Celik (2012) and Slay et al. (2008), making optimal use of the promising interactive technology tools such as IWBs demands crucial changes in the common practices of teaching and curriculum development. It is speculated that using IWBs will certainly become essential ICT tool in educational settings all over the world as well as Turkey. Therefore, it would be reasonable and wise to argue that teachers should be provided with the opportunity to get familiar with the IWB technology, its pedagogical aspects along with instructional potentials and advantages through in-service training workshops which may serve as a medium for gaining required skills and creating self-confidence in teachers to use this new technology properly. Türel & Johnson (2012, p. 362) also argue that teachers need training on using effective instructional strategies for IWB-assisted courses so that they will be able to transform their pedagogy into more student-centered, social and interactive learning. They further assert that this training has two caveats: "1) one time training sessions provided by the representative of IWB supplier are superficial, and 2) schools do not have the time and budget to provide regular training sessions. As such, teachers should be supported to continuously use IWBs in their classrooms by working with their peers in order to improve their IWB skills and knowledge". This assertion is further supported by Isman, Abanmy, Hussein and All-Saadany (2012) who emphasize that teachers need to get training in improving student learning and their teaching competencies by participating in a professional development program aimed at effective use of IWBs.

As for the students, the findings of t-test revealed that their perceptions of IWBs do not display any difference with respect to their gender. However, the results of One-way ANOVA demonstrated that the participants differ in their perceptions according to their language proficiency level and these differences between students were observed at the beginners' level of A2, and intermediate levels of B1 and B2. This implies that as the students continue using the IWBs, their perceptions of new technology changes over time and one could easily capture the fluctuations inherent in their perceptions until they gain upper hand in dealing with and manipulating IWBs. However, when they reach the C1 and C2 levels, a state of high intellectual development in mastery of language skills, their early excitements over the use of IWBs reduce and become more skilful in using IWBs. This suggests that they feel they are efficient enough to deal with the new technology. That's why their ratings exhibit no significant differences in their perceptions of IWBs.

Additionally, the results of One-way ANOVA test reported significant differences between students' hours of weekly IWB use and their perceptions of using them in language learning classroom. The examination of post hoc results revealed that individuals with '3-5 hours' IWB use differ significantly from '6-10 hours' and '11 hours and more' groups. This implies that the more students are involved in using IWBs, the more their perceptions change during language classrooms. That's why the greatest mean differences exist between those who use more IWBs than those who are at their early stages of IWB experience.

The findings of the present study showed that the highest mean scores for students were ascribed to perceived learning contribution dimension indicating that students are aware of the pedagogical benefits of IWBs (Celik, 2012). They feel that using IWBs by teachers helps them learn more and better understand the lessons particularly when the audio and visual materials are presented in an integrative manner. Furthermore, while admitting the existence of some technical problems in employing IWBs, using IWBs, they think, provides opportunity for them to have access to a wide variety of sources to learn from and this helps them to remember and retain what they learn for a long time. They also feel that IWBs are beneficial in creating meaningful and promising interaction during lessons. The same results were found by Yáñez & Coyle (2011) who conducted a small-scale study that focused on an English language immersion classroom in a British primary school in Spain. Their findings indicated such issues as the children's desire to interact more with the IWB, their frustration with frequently occurring technical problems, and the importance, particularly for the non-native speakers (NNS), of the multimodal properties of the board. Therefore, teachers and course designers should pay more attention to the great enthusiasm revealed by the students and take great care when planning for an active IWB-based classroom. By so doing, they will be able to make it possible for the curriculum and teachers to end up with what Lopez (2006) calls, 'Lighting the flame of learning for English Language Learners'.

The results of the present study also indicated that the students recognize the potential of the new technology for raising their motivation to share knowledge with classmates by means of individual and group presentations. More than two third (70%) of the students expressed their willingness to go to the front of the class to use an IWB because the IWB, they believe, makes it easier for them to be motivated during the lesson, helps them concentrate more on teaching materials and makes learning English more exciting. This suggests that IWBs are useful educational tools which foster students' motivation and involvement in learning activities; attract their attention, increasing concentration on the materials being taught. These findings are supported by the findings of other studies on IWBs (Bell, 2002; Elaziz, 2008; Mathews-Aydinli & Elaziz, 2010, Smith, 2001; Smith et al., 2005; Türel & Johnson, 2012; Schmid, 2006, 2008; Holmes, 2009; Torff & Tirotta, 2010; Yang & Tang, 2014). It should be noted that the motivational aspects of IWB use were received much weight both by teachers and students in their ratings. However, compared with students (69.5%), teachers seem to be more impressed by motivational aspects of IWB use (89%). It would be reasonable to argue that equipped with a comprehensive knowledge and understanding of how IWB technology operates, teachers and students will better manage the teaching and learning processes, make use of the new technology in best possible ways to incorporate audio and visual materials spontaneously and promote the quality of integrating technology in EFL classrooms.

The findings of the present study further demonstrated that teachers and students differ greatly in their perceptions of IWB use. Totally, 80% of teachers agreed with the overall perceptions of IWB use in EFL classrooms while 67% of students agreed with overall perceptions of IWB use. Furthermore, 96% percent of teacher's mean scores and 80.77% of students' mean scores received for all items were found to be fallen within the highest category of the self-developed cut-off points for perceptions of IWB use. Therefore, it can be concluded that teachers have higher perceptions of IWB use than students do. Additionally, the highest mean score for hours of weekly IWB use was observed for females in students group whereas males received the highest mean score in teachers group. Surprising as it may seem, despite differences in male and females Hours of weekly IWB use, both students and teachers who scored highly in their perceptions spent the same amount of time on using IWBs. This implies that time spent on using IWBs plays an important part in shaping teachers' and students' perceptions of using new technology.

The results of qualitative data also supported the findings of quantitative analyses of teachers' self-reported perceptions of IWB use in relation to the general attitudes on the pros and cons of IWB use in EFL classrooms. Most of the interviewees put much weight on the importance of training for the effective use of IWBs, the vital role of IWBs in capturing students' attention and motivating them towards more participation in classroom activities, spontaneous incorporation of IWBs and other related software along with authentic course books containing rich, authentic and up to date materials. However, some teachers believed that IWBs should be employed cautiously and timely considering the main goals of teaching and learning because they are supplementary tools for promoting the quality of teaching and learning process not for entertainment. They were also complaining about the technical inconsistencies due to the breakdown in IWBs during teaching, the inadequacy of training they receive for IWBs during workshops emphasizing that the IWB training courses must be offered continuously so that all teachers would be able to catch up with the new developments in new technology, and develop and update their knowledge and skills of employing IWBs in their practical teaching.

These findings of the qualitative data are broadly in line with Schmid and Schimmack (2010) who also found that teachers, despite having full access to the technology, do not have the required skills and knowledge of how to use ICT in general and IWBs in particular to enhance their practice. Their study shed more light on the fact that IWB use is exploited through 'trial and error' approach which has proved to be ineffective and of no practical advantage to help them enhance their knowledge and understanding of the new technology and its potential applications as an ICT tool in enhancing the quality of teaching practice. Therefore, curriculum developers should bear the greater burden of organizing and offering any desirable and efficient pre-service and in-service training courses, workshops so as to develop the necessary competencies and skills in teachers to manipulate IWBs. A long-term programming in teacher education as well as the required budget is needed to be officially ratified in advance of training pre-service English teachers. Moreover, English Language Teaching (ELT) departments should incorporate required courses on the use of IWBs in their programs with the purpose of developing skills and competencies needed for the effective use of IWB technology. Schmid & Schimmack (2010, p. 211) spell out some of the competencies that can be developed through pre-service and in-service training course as follows:

- designing IWB materials, which support opportunities for learner interaction with the whiteboard and with the learning content
- managing IWB-based activities in a way that ALL learners are provided with opportunities to become actively involved in the learning process

- coherently integrating various multimedia resources in IWB-based lessons by considering issues of pace, cognitive load and learners' active processing of these materials
- enhancing the functionality of the IWB through the use of peripheral hardware and software
- finding and evaluating ready-made digital materials, which can be used in connection with the IWBs.

It is worth noting here that despite having some advantages, technological equipment and facilities presumably have their own challenges and limitations too and are often criticized for their shortcomings. IWBs would, of their very nature, necessarily bear the brunt of this criticism as well. All participants agreed with the fact that using IWBs needs knowledge and skill. Although both students and teachers agree impressively on the benefits and effectiveness of IWBs, one could still argue that IWBs are not the panacea for all our problems encountered during language learning. It is a fact that using IWBs is largely dependent on the availability of such facilities as computers and high-speed Internet networks so as to be able to incorporate audio-visual materials spontaneously. That is, there are some prerequisites of use without which the IWBs will be of no help in classrooms. This predicament of IWB use becomes more acute if we consider the financial problems which schools with limited budgets and limited access to the internet, and inadequate computers in their stock may encounter with in using IWBs.

CONCLUSION AND RECOMMENDATATIONS
This study aimed to present the teachers' and students' perceptions on the effectiveness of IWBs in EFL classrooms in the context of Turkey which is now experiencing a rapid shift from traditional boards towards using newly developed IWBs in Turkish schools, institutes and educational settings beginning with 'Fatih project'. The aim was to find out how teachers and learners perceive the incorporation of new technology into school curriculum will affect learning English as a foreign language without providing any value judgments on the potential and virtual contributions of the new innovation to the EFL classroom.

The results of self-report questionnaires showed that Turkish EFL students and teachers have overall positive perceptions and attitudes towards IWBs and, as studies in the field also indicate, they consistently report high levels of enthusiasm for the IWB technology. They like IWBs and claim that they feel comfortable using it, and also believe that it is a very innovative and powerful support for language acquisition and has a best supplementary function in promoting language proficiency as a beneficial teaching tool. Therefore, curriculum planners, administrators and technology decision makers should take care of the growing interest toward new technology in order to ensure the translation of this enthusiasm and interest to IWBs into effective, purposeful and promising practice. Indeed, the IWB technology serves as a medium between technical innovations and pedagogical practice. Therefore, the IWB use requires more skills and creativity for which the appeal is immediate and irresistible, and for which the IWB is an important 'stock- in- trade'.

It was stated that one of the advantages of IWBs is the opportunity to incorporate various types of materials into teaching process. Further research in IWB use in L2 is required to give much weight to the in-depth investigation to find out whether EFL teachers use different pedagogical approaches to integrate IWBs into their teaching practice. Moreover, future research should attempt to examine how the perceptions of experienced and novice teachers differ with respect to their capacity to comply with new technology and the integrative skills in using IWBs.

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THE APPLICATION OF A CLOUD-BASED STUDENT, TEACHER, AND PARENT PLATFORM IN ENGLISH AS A FOREIGN LANGUAGE EDUCATION

Fu-Yuan Chiu
Department of Education and Learning Technology, National Hsinchu University of Education, Taiwan
iddna@mail.nhcue.edu.tw

ABSTRACT
This study constructed a cloud-based student, teacher, and parent platform (CSTPP) in collaboration with a Taiwanese textbook publisher. Junior high school students' attitudes to learning English using the developed system were subsequently examined. The study participants were divided into 3 groups: Those in Group A employed the CSTPP with parental participation, those in Group B employed the CSTPP without parental participation, and those in the Control group received traditional lectures. A learning attitude questionnaire was used to assess the students' responses before and after adopting the 3 learning models. The results of this study indicated that the students who used the CSTPP with parental participation, exhibited altered attitudes toward the teaching methods within 1 month because their assumption that they could only learn from teachers was overturned. After the experiment, a system satisfaction survey was conducted with the students who had used the CSTPP on tablet PSs in classrooms and those who had used the CSTPP on computers at home. Regarding the survey results, both groups of students obtained high scores. In addition, the overall design of the CSTPP was popular among students. This platform is currently available on www.ehanlin.com.tw for students to access and use.

Keywords: junior high school; cloud computing; attitudes to learning English

INTRODUCTION
The prospering field of cloud computing provides a more open and diverse learning environment. In various countries, teachers are continuously introducing innovative learning models in classrooms to promote student learning (Sultan, 2010). Cloud computing has reduced operating costs for numerous enterprises (Gupta, Seetharaman & Raj, 2011) and decreased the cost of purchasing software and hardware for educational institutions (Stein, Ware, Laboy & Schaffer, 2013; Ercan, 2010). Numerous countries such as United States (Reynolds, 2011) and South Korea (Lee, 2013) have announced the goal of fully replacing traditional textbooks with electronic textbooks over the next several years. Electronic textbooks will become a new future trend of education with many advantages such as: portability, lower cost, and desired by the "Y" generation (Weisberg, 2011). Since most electronic textbooks from cloud computing technology, so countries began to establish variety of educational cloud (Mousannif, Khalil & Kotsis, 2013). In past studies, the parents through mobile phone messaging (Ho & Hung, 2013), blog (Ozcinar & Ekizoglu, 2013), and school management information system (Telem, 2005) to join student learning, the results have to improve academic performance. However, the two major characteristics cloud computing: "resource sharing" and "ubiquitous" are more suitable for communication among students, teachers, and parents. Paechter and Maier (2010) randomly selected 2,196 students from 29 Australian universities to survey. Regarding their results, the students asserted that online assessments provided a clear and consistent explanation of the class content, which enabled the students to self-adjust their efforts according to their learning speed, effectively enhancing their learning performance. Vasileios, Christos, and Anastasios (2013) found that the usability and entertainment value of computer-based assessments were two main reasons for students' continual usage. Terzis, Moridis, and Economides (2013) reported that the feedback function of computer-based assessments positively influenced student learning.

Active language learning attitudes stimulate students to exhibit positive attitudes toward learning English (Karahan, 2007). Teachers can encourage students to improve their learning attitude by providing positive learning environments and examples (Callahan & Clark, 1988). Gömleksiz (2010) asserted that the content and homework assignments of English courses crucially influenced students' attitudes to learning English. Dr. Gömleksiz recruited 1,275 Turkish undergraduate students as research targets, and investigated the influence that variables such as sex, college study year, and study major exerted on their attitudes to learning English. The results showed that sex, college study year, and study major significantly influenced students' attitudes to learning English. Kim (2010) also recruited 1,037 high school students to investigate Korean high school students' English learning motivation and attitudes. The results showed that the students' motivation comes from studies and career, on the other hand, the attitude comes from the history with United States. Cid, Grañena, and Tragant (2009) developed the foreign language attitudes and goals survey (FLAGS), which has subsequently

undergone a three-stage revision. The target of the original questionnaire was Spanish high school students studying English as a foreign language (EFL), which accorded with the research targets of this study. The first stage involved exploratory research conducted by Elsa and Muñoz in 2000 and 2001 with 900 teenagers aged 10, 12, 14, and 17 years. The results were divided into eight dimensions and then revised and edited into a questionnaire. The second stage involved a pretest. They revised the questionnaire based on the results obtained in 2000 to 2001, the theories and research of other scholars, student perspectives, and completed questionnaires. For the final stage, 83 students were recruited to complete the questionnaire. Based on the results, the questionnaire content was further revised into the three dimensions of "motivation to learn English and appeal of the English language," "attitudes toward instruction," and "linguistic self-efficacy." The dimension of "motivation to learn English and appeal of the English language" concerned the determinants of students' English language learning both in and out of class and whether they liked the English language. The dimension comprised 16 items with an α value of 0.93. The dimension of attitudes toward instruction concerned students' opinions of the English language learning classes and their own performance and comprised 11 items with an α value of 0.91. The aspect of "linguistic self-efficacy" concerned students' opinions regarding learning English, such as their ability to use English and the difficulties they experienced, and comprised 11 items with an α value of 0.87.

Accordingly, the study researcher collaborated with a Taiwanese textbook publisher (Han Lin Publishing Co., Ltd.) to construct a cloud-based student, teacher, and parent platform (CSTPP). In the past, parents could only obtain an update of children's learning situations from parent-teacher communication logs and grade reports. Opportunities for mutual communication between students, teachers, and parents were extremely rare, leading to parents' limited involvement in student learning. The design concept of the CSTPP employed the lack of time or space restrictions characteristic of cloud computing to produce learning progress reports through a continuous process of testing, diagnosing, and remedying. Parents were kept informed of their children's learning performance through close communication with teachers and could watch remedial teaching videos with their children. Thus, the parents were able to achieve their goal of assisting with their children's homework. This study adopted English language learning as the research subject because many non-English-speaking countries require students to learn English as a second language. However, junior high school students' level of English language ability differs substantially, and teachers are typically troubled when teaching a class of students with varying English levels. Therefore, the development of a learner-centered and progress-customized teaching platform has been anticipated by students, teachers, and parents. The CSTPP was employed as a research tool to investigate the influence that parental participation in using the CSTPP exerts on junior high school students' attitudes to learning English.

THE CLOUD-BASED STUDENT, TEACHER, AND PARENT PLATFORM, CSTPP
The primary research tool was the CSTPP prototype constructed in collaboration with a textbook publisher (Han Lin Publishing Co., Ltd.). Regarding the test environment, the developed system had the advantage of cloud computing and could be operated on any PC or mobile device (such as tablet PCs or smart phones). Moreover, the CSTPP recorded students' learning progress, enabling them to identify and address their learning deficiencies. Thus, the goal of increasing students' learning performance could be achieved. Every process of the cyclic learning mode developed in this study is explained below.

Test
Using the CSTPP, students can choose the test subject and scope for self-evaluations. The test questions were randomly numerically arranged by the system, and 20–23 multiple-choice questions were randomly selected for each learning unit. Because the order of the questions and answer options differed for every test, the students could conduct repeat tests on the same subject and scope without encountering the same questions.

Diagnose
Every test question in the CSTPP item pool corresponded to a subject-specific weakness. Thus, the students could identify their weaknesses based on the questions they answered incorrectly. The system also produced a diagnostic report based on the students' test results, enabling the teacher and parents to understand the students' current learning situation and plan additional remedial education. Only a few previous test activities have provided accurate diagnoses of students' subject-specific weaknesses, hindering teachers and parents from offering assistance. Identification of the students' subject-specific weaknesses not only enabled them to understand their barriers to learning and reduced their fear or uncertainty regarding the subject, but also provided the teachers and parents with a concrete understanding of the students' learning situations, rather than a general idea based on abstract test scores.

Remedy

After identifying the participants' learning difficulties, the CSTPP provided remedial education targeted to the participants' subject-specific weaknesses. The students could read the answers to particular questions or watch educational videos related to subject-specific weaknesses. Finally, the students completed another test with the same scope to assess whether the subject-specific weakness had been resolved. The effectiveness of remedial education was then determined by the presence of subject-specific weaknesses.

The entire learning process involved an uninterrupted cycle of Test, Diagnose, and Remedy, forming a progressive improvement learning process (as shown in Figure 1). With the CSTPP, students who exhibited a superior performance spent less time in the remedy stage, showed enhanced learning progress, and were not restricted by the progress of the rest of the class. Students who exhibited a less satisfactory performance developed their confidence and overcame the barriers to their learning by continuously addressing their subject-specific weaknesses after each cycle.

Figure 1. The continual improvement process in CSTPP

The CSTPP was constructed to provide a learner-centered and progress-customized teaching platform that provided gradual remedial education to every student to improve their learning performances according to their abilities and level. The user-end of the CSTPP was divided into student, teacher, and parent dimensions. The student-end included academic achievement testing, academic weakness diagnosis, and remedial learning. The teacher and parent-ends included modules of parent-teacher communication logs, study progress, and student's learning progress, as shown in Figure 2. The system design modules of the academic achievement testing, academic weakness diagnosis, remedial learning, parent-teacher communication logs, study progress, and student learning progress are explained below.
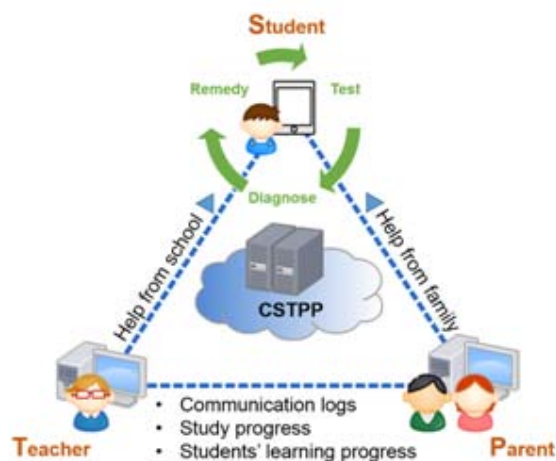
Figure 2. The relationship among students, teachers, and parent

THE STUDENT-END
Self-evaluation
Students can select 1 to 3 units for self-evaluation. To enhance the effectiveness of students' remedial education, the CSTPP contained over 100,000 test questions for each teaching topic of every field and unit. The students were presented with differing questions or choices every time, providing the opportunity for repeated practice. Furthermore, a timer appeared at the upper-right corner of the screen when the students were undergoing self-evaluations to record their answering speed for subsequent analysis.

Self-evaluation transcript
The function of Self-evaluation transcript provided students with instant feedback. The transcripts in CSTPP is

different from traditional transcripts, it not only shows score but also includes the learning objectives, correspondence courses, and test questions analysis. Through these information, the students could review their answers immediately and identify the areas of knowledge that required improvement. Teachers could also identify the areas that the students misunderstood from the evaluation reports to correct their understanding and provide references for assisted teaching, such as the scaffolding effect of peer collaborative learning, to assist students in gaining a complete understanding. Consequently, evaluations were not only used to review learning outcomes but as a crucial tool for guiding student learning. The formative assessments of this platform were more valuable for students and teachers than traditional summative assessments (such as regular tests) because they provide instant feedback and allow teachers to adjust their teaching according to the students' learning requirements.

Test questions analysis
With traditional examinations, students obtain the results after teachers provide the answers and only comprehend the answer to questions completed incorrectly when teachers conduct reviews. However, the CSTPP provides immediate resolutions to questions answered incorrectly, and enables the students to obtain the test results instantly. Based on the evaluation diagnosis results, students can click to view the resolutions to questions answered incorrectly to acquire satisfactory learning scaffolding without guidance from teachers. Instantly addressing students' blind spots enables them to experience the effectiveness of immediate remedial education. Because the CSTPP provides prompt feedback during practice, the students' mistakes were efficiently amended.

Remedial analysis
The remedial analysis page shows that total correct rate of each subject and provides informations include importance, learning objectives, and corresponding unit for each learning weaknesses. Related teaching materials were collected based on the learning concept requirements of each teaching topic. Well-known cram school teachers were recruited to record teaching videos that addressed the students' learning weaknesses in every unit to provide clear resolutions. The students could watch the teaching videos anytime according to their learning progress, and undergo remedial education targeted to their incorrect concepts. Because the videos in the CSTPP were edited according to the students' learning weaknesses, every video was extremely short. Compared with the CSTPP videos, traditional teaching videos are typically excessively long because they are recorded according to units. Additionally, students tend to tire of traditional teaching videos easily.

Database of personal learning weaknesses
After each test, CSTPP will identify learning weaknesses from the wrong answer and create a database to manage. Students can understand theirs learning weaknesses in each subject, and then the learning weaknesses were terminated through system assisted (Such as marking importance, calculating the completion rate of review, Watching video review, and repeatedly test). Through learning weaknesses gradually reduced, students' confidence and learning interest relatively increased.

THE TEACHER-END
Teachers can log onto a dedicated page to execute the function of "one-to-many class management" and review students' performances in self-evaluation tests, as well as the distribution of their learning weaknesses. The results of these reviews were used as a reference for remedial education. The primary functions of the teacher dimension were as follows:
Parent-teacher communication logs
This function enabled teachers to search and review students' academic performance, subject-specific weakness distributions, remedial review times, and attendance for every subject.

Study progress
Teachers can arrange weekly review progress tables for students based on the teaching schedule progress of the school. The effectiveness of reviewing a specific unit or chapter can also be listed as a reference for teachers and parents in assisting students with reviews.
Students' learning progress
The learning status of all of the students was recorded in the CSTPP, including their previous test grades and the videos and animations watched. The teachers could then fully control the students' learning progress and provide timely supervision and guidance to students who were behind schedule or unmotivated.

THE PARENT-END
The webpage of the parent-end was similar to that of the teacher-end. Parents can log onto a dedicated page to review their child's performance in every self-evaluation test and the distribution of their learning weaknesses.

The interface of parent-end is the same of the teacher-end. The primary functions of the parent dimension were as follows:

Parent-teacher communication logs
This function enabled parents to search and review their child's academic performance, subject-specific weakness distributions, remedial review times, and attendance for every subject. Parents can understand the progress of the class, as scheduled by the teachers on the CSTPP, at any time to assess whether their children were left behind.

Students' learning progress
The learning status of all of the students was recorded in the CSTPP, including their previous test grades and the videos and animations watched. This enabled the parents to understand the time and energy their child spent studying based on their child's learning records. Thus, the parents could provide appropriate encouragement and reminders.

CASE STUDY
A quasi-experimental and nonequivalent pretest-posttest research design was adopted to investigate the influence that the three learning styles of using the CSTPP with parental participation, using the CSTPP without parental participation, and traditional lectures had on junior high school students' English learning attitudes and performances. A class was regarded as one research sample unit, and three classes from a junior high school were randomly recruited for this study. Each class comprised 24 students, resulting in a total of 72 students. The students in Group A completed a teacher-assigned unit by using the CSTPP on a computer at home. The teacher monitored the progress of every student from the teacher-side platform and contacted parents via telephone calls and instant messages to ensure that every student used the CSTPP, particularly the three processes of test, diagnose, and remedy. The students in Group B used the CSTPP on tablet PC in English language class with the teacher's assistance. The teacher ensured that every student completed the three processes of test, diagnose, and remedy. The Control group received traditional lectures, in which the teacher provided didactic teaching using a projector and the multimedia compact disc included with the textbook. Test sheets were employed, and several questions that the entire class frequently misunderstood were reviewed. The duration of the experiment investigating changes in the students' attitudes to learning English alterations was 3 months. A system satisfaction survey was conducted with the students who had used the CSTPP with and without parental participation.

Measuring Attitudes to Learning English
The questionnaire used for this study was a revised version of the FLAGS proposed by Cid et al. (2009). The three dimensions of "motivation to learn English and appeal of the English language," "attitudes toward instruction," and "linguistic self-efficacy" extracted from the original questionnaire were revised into the five dimensions of "motivation to learn English," "attitudes toward instruction," "appeal of the English language and other foreign languages," "linguistic self-efficacy," and "diligence level," for which 31 items were designed. The participating students were instructed to answer the questions based on their personal status and feelings. The participants' responses to the questionnaire were scored using a 4-point Likert scale that comprised the answer options "extremely agree," "agree," "disagree," and "extremely disagree" (as shown in Appendix 1). During the revision process, three junior high school English teachers were recruited to edit and modify the attitudes to learning English questionnaire. After the revision, a pretest was conducted with a class of 30 eighth grade students who had not participated in the experiment. Internal consistency was adopted for reliability analysis. The reliability (Cronbach's α) was .798 for the overall scale, which indicated that the revised questionnaire was stable and reliable. Regarding validity, the total explanatory power of the five subscales reached 56.024%. The reliability and validity analysis results confirmed that the revised questionnaire possessed high reliability and validity and was suitable for use as a measuring instrument in this study.

FINDINGS
Descriptive analysis was conducted on the results of the attitudes to learning English questionnaire provided by the students in Groups A and B and the Control group. Furthermore, pre and posttests of a paired samples t-test were conducted to identify differences. Finally, a satisfaction survey was administered to the students in Groups A and B who had used the CSTPP to conduct future improvements to the system.

Pre and Posttest Differences in Attitudes to Learning English
The means and standard deviations of the five dimensions "motivation to learn English," "attitudes toward instruction," "appeal of the English language and other foreign languages," "linguistic self-efficacy," and

"diligence level" are listed in Table 1. Data obtained in the pre and posttests were quite similar for every group; thus, further analysis was employed.

Table 1. The descriptive statistics of three groups

Subscales		Mean		Standard deviation	
		Pre-test	post-test	Pre-test	post-test
Motivation to learn English	Groups A	2.84	2.95	0.66	0.62
	Groups B	2.35	2.95	0.39	0.62
	Control group	2.86	2.34	0.57	0.32
Attitudes toward instruction	Groups A	2.68	2.96	0.71	0.64
	Groups B	2.45	2.52	0.13	0.21
	Control group	2.64	2.66	0.69	0.55
Appeal of the English language and other foreign languages	Groups A	2.88	3.12	0.42	0.55
	Groups B	2.19	2.03	0.23	0.15
	Control group	2.84	2.97	0.48	0.56
Linguistic self-efficacy	Groups A	2.60	2.75	0.68	0.72
	Groups B	2.76	2.74	0.07	0.14
	Control group	2.42	2.58	0.82	0.65
Diligence level	Groups A	2.55	2.57	0.38	0.36
	Groups B	2.66	2.46	0.32	0.31
	Control group	2.29	2.34	0.32	0.46

The pre and posttests of the paired samples t-test results for Group A are presented in Table 2. Observing every subscale of the attitudes to learning English questionnaire, the differences in the means of the pre and posttest results for "attitudes toward instruction" achieved a level of significance. This showed that there was a significant difference in the pre and posttest scores regarding "attitudes toward instruction" compared with the Control group. The pre and posttests means of the other four dimensions "motivation to learn English," "appeal of the English language and other foreign languages," "linguistic self-efficacy," and "diligence level" did not exhibit significant differences.

Table 2. The paired samples t-test results for Group A

Pre-test/post-test	Mean	Standard deviation	t-statistic	p-value
Motivation to learn English	.113	.505	1.10	.282
Attitudes toward instruction	.275	.612	2.20	.038 *
Appeal of the English language and other foreign languages	.233	.663	1.72	.098
Linguistic self-efficacy	.152	.852	-.878	.389
Diligence level	.020	.396	-.257	.799
Total	.154	.488	1.55	.135

*$p<.05$

Group A showed an obvious increase in "attitudes toward instruction" after using the CSTPP with parental participation. Because the CSTPP made learning simple and interesting and reduced learning anxiety, the students' attitudes to English instruction were significantly improved.

The pre and posttests of the paired samples t-test results for Group B are shown in Table 3. The statistical results indicated that the differences in pre and posttests regarding the overall attitudes to learning English of the 24 students in Group B did not reach the level of significance. Therefore, no significant difference existed in the students' pre and posttest attitudes to learning English for Group B.

Table 3. The paired samples t-test results for Group B

Pre-test/post-test	Mean	Standard deviation	t-statistic	p-value
Motivation to learn English	-.008	.213	-.127	.901
Attitudes toward instruction	.070	.133	1.175	.305
Appeal of the English language and other foreign languages	-.158	.261	-1.355	.247
Linguistic self-efficacy	-.023	.144	-.396	.708
Diligence level	-.200	.169	-2.371	.098
Total	-.008	.213	-.127	.901

*p<.05

The pre and posttests of the paired samples t-test results for the Control group are shown in Table 4. The statistical results indicated that the differences in the pre and posttests regarding the overall attitudes to learning English of the 24 students in the Control group did not reach the level of significance. Therefore, no significant difference existed in the students' pre and posttest attitudes to learning English for the Control group.

Table 4. The paired samples t-test results for Control group

Pre-test/post-test	Mean	Standard deviation	t-statistic	p-value
Motivation to learn English	.007	.471	-.079	.938
Attitudes toward instruction	.016	.698	-.117	.908
Appeal of the English language and other foreign languages	.125	.604	1.014	.321
Linguistic self-efficacy	.160	.920	-.850	.404
Diligence level	.052	.494	-.516	.611
Total	.063	.522	-.592	.560

*p<.05

The CSTPP Satisfaction Survey
After the experiment was conducted, a system satisfaction survey was administered to the students in Groups A and B who had used the CSTPP. As shown in Table 5, the questionnaire comprised 10 items, which were scored using a 4-point Likert scale, where 4 = "extremely agree," 3 = "agree," 2 = "disagree," and 1 = "extremely disagree." Data in Table 5 show that both groups had high evaluations of the system. However, the scores of Group A were slightly higher than those of Group B. Regarding the differences between the two groups, the top three items for which the results achieved by Group A substantially exceeded those of Group B were Item 1 "The CSTPP makes learning more efficient," Item 2 "Using the advanced CSTPP in class makes me feel superior," and Item 4 "I know how to use the CSTPP without guidance from the teacher." The top three items for which the results achieved by Group B substantially exceeded those of Group A were Item 8 "I am very satisfied with the visual design of the CSTPP," Item 9 "My interest in learning English increased after using the CSTPP," and Item 5 "I can operate the CSTPP skillfully and swiftly after instruction from the teacher."

Table 5. The questionnaire learning attitudes

Items	Group A	Group B	Deviation

1.	The CSTPP makes learning more efficient	3.27	4.17	.90
2.	Using the advanced CSTPP in class makes me feel superior	3.12	3.75	.63
3.	CSTPP relieve my academic stress.	3.46	3.71	.25
4.	I know how to use the CSTPP without guidance from the teacher	2.29	2.88	.59
5.	I can operate the CSTPP skillfully and swiftly after instruction from the teacher	4.13	3.12	1.01
6.	I can adapt the CSTPP quickly	4.25	3.27	.98
7.	The diagnosis of CSTPP can help me understand my weaknesses	3.67	3.35	.32
8.	I am very satisfied the visual design of CSTPP	4.13	2.92	1.21
9.	My interest in learning English increased after using the CSTPP	3.71	2.58	1.13
10.	I am very happy to learn other subjects through CSTPP	3.75	3.15	.60
	Average scores	3.58	3.29	

CONCLUSIONS

This study applied the CSTPP as a research tool and investigated the effects that the test, diagnosis, and remedy cyclic learning model has on junior high school students' English language learning. Students' attitudes to learning English differed before and after using the CSTPP with parental participation, without parental participation, and after receiving traditional lectures.

Generally, before and after using the CSTPP, both with (Group A) and without (Group B) parental participation, and receiving traditional lectures (Control Group), the students did not exhibit significant differences in their attitudes to learning English. Only the students who used the CSTPP with parental participation exhibited substantial progress in their pre and posttest results for "attitudes toward instruction" in the learning attitude questionnaire. This finding indicates that the CSTPP is better suited to home-based self-study. Compared with using the CSTPP in classrooms without parental participation, when students conducted self-study at home, and teachers interacted closely with parents via the telephone or messages to collaboratively supervise students' learning progress, students attitudes' toward instruction were more effectively enhanced, and a learner-centered innovative teaching mode was achieved.

The system satisfaction of the students who used the CSTPP without parental participation was superior to that of the students with parent participation. The three main findings of the system satisfaction survey regarding whether using the CSTPP with parental participation was superior to using the CSTPP without parental participation were as follows:

First, the students asserted that using the CSTPP without parental participation was comparatively more efficient. After conducting the experiments and surveying the students, the researchers found that when the parents participated in using the CSTPP, because the learning environment was at home, the students could arrange their own study time. When parents did not participate in using the CSTPP, because the learning environment was in the classroom, the students were required to complete the assignment allocated by the teacher within a certain time frame. Second, using the CSTPP without parental participation resulted in a higher sense of superiority than using the CSTPP with parental participation. After conducting the experiments and surveying the students, the researchers found that using tablet PCs in classrooms and cloud computing technology services before other classes enhanced the students' sense of superiority. Because the learning environment was at home for the students who used the CSTPP with parental participation, they could not perceive a sense of superiority by comparing themselves with other students. Third, a higher score of students could use the CSTPP without assistance from the teacher when using the CSTPP in the classroom compared with that of students who used the CSTPP at home. After conducting the experiments and surveying the students, the researchers found that using tablet PCs and cloud computing technology in classrooms increased the students' confidence and willingness to use new software.

Regarding suggestions for future researchers, the test, diagnosis, and remedy cyclic learning model in the CSTPP clearly informed the teachers and parents of the students' learning blind spots and provided more precise remedial education according to the students' inaccurate knowledge perceptions. In addition, the CSTPP

provided immediate feedback that allowed the students to identify the areas they misunderstood in real time. The learning assistance provided by the CSTPP, such as the answers to questions completed incorrectly and teaching videos, enabled the students to comprehend the class content completely. Furthermore, similar to other online examination systems, Internet access is required to use this system, which could lead to some students becoming distracted by online games or social networking websites. Accordingly, this study suggests that teachers and parents remind and supervise students in developing satisfactory habits of online assessment use before conducting online assessments or learning, to prevent students from becoming lost on the Internet. Finally, regarding the cloud education environments in schools, considering Taiwan for example, although nearly all schools are equipped with broadband Internet, wireless Internet access is rare. In response to the trend in mobile learning initiated by the emergence of electronic textbooks and tablet PCs, this study suggests that schools include wireless broadband Internet equipment in their budgets for computer-related equipment. Thus, the education vision of ubiquitous learning for students can be realized.

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APPENDIX **1.** The questionnaire of measuring attitudes to learning English

Dimensions	Items

Motivation to learn English	1. I like learning English. 2. I would like to be able to speak English as well as I speak Chinese. 3. I am interested in learning English. 4. I would like to learn more languages, not just English. 5. I really want to learn English 6. If I could choose the subjects I like best, I would probably choose English. 7. If English was not taught at school, I would like to learn it somewhere else. 8. When I grow up, I will want to be able to speak English. 9. When I leave secondary school, I'd rather not go on learning English.* 10. I like it when the teacher talks to us in English. 11. I like it when the teacher uses videos or cassettes in class.
Attitudes toward instruction	12. In general, I have always found English class Exciting. 13. I like the way English is taught at school. 14. In general I find that learning English is fun. 15. I like English class because it is more entertaining than other subjects. 16. What we usually do in class is boring.*
Appeal of the English language and other foreign languages	17. I find English an attractive language to learn. 18. I would like to learn more languages than just English. 19. I don't like the sound of spoken English.* 20. I think English is a nice language. 21. I like other foreign languages better than English.
Linguistic self-efficacy	22. In general, I am doing very well in English. 23. I have noticed that my English is getting better. 24. I find it easy to understand the videos and cassettes that the teacher brings to class. 25. I think my English will never be good enough to understand movies.* 26. In general, I find it easy to learn languages. 27. Sometimes I don't understand my English homework.*
Diligence level	28. At home I usually go over what we have done in English class. 29. In English class I pay close attention to the activities that the teacher tells us to do. 30. I pay less attention in English class than I do in other subjects.* 31. When I see something in English, I try to see if I can understand it.

*Negatively worded items.

THE CURRENT PRACTICE OF INTEGRATION OF INFORMATION COMMUNICATION TECHNOLOGY TO ENGLISH TEACHING AND THE EMOTIONS INVOLVED IN BLENDED LEARNING

Mei-jung Wang
National Kaohsiung University of Hospitality and Tourism/ Associate Professor
Email: sebrina@mail.nkuht.edu.tw

ABSTRACT
The effective and confident integration of information communication technology (ICT) tools and programs can be frustrating. Hence, providing emotional support for teachers who are willing to adopt ICT in language instruction is an issue worthy of attention. In order to promote ICT-supported language instruction, this study aims to identify the contexts and types of emotions experienced by teachers. Teachers in universities of technology were invited to participate in this study in order to share their experiences and emotions in applying ICT in language courses. We address the following research questions: 1) What are the current practices of ICT by language teachers in higher education? 2) What emotions are involved in the integration of ICT into language courses? Questionnaires and interviews were adopted to collect relevant data. The results showed that teachers have positive attitudes toward integrating ICT integration but a gap exists between the extent to which teachers enjoy using technology and the degree to which they use the technology in their classes. Regarding the emotions expressed by teachers, most were happy with their utilization of ICT. However, negative emotions experienced are anxiety, anger, and sadness.   These negative emotions often resulted from unexpected responses, student performance, or the technological equipment.

BACKGROUND
The introduction of innovative technologies to support effective teaching strategies has become a trend in all levels of education and is rapidly spreading to all continents of the world. For example, the use of information communication technology (ICT) in European higher education is considered a prerequisite for adaptation by teachers(García-Valcárcel & Tejedor, 2009). UNESCO Bangkok (2003) also launched a program to promote the use of ICT in education in Asia and the Pacific region. With the financial support of Japanese Funds in Trust (JFIT), the program aims to enhance technology-assisted learning and bridge the digital divide in education in Asia and the Pacific. The program aims to support education communities in meeting the challenges of capacity building and policy changes in achieving the goals of Education For All (EFA) in new, technology-facilitated learning environments in the emerging information society. Technological advances in the past decades have resulted in new opportunities to use technology to improve learning and teaching. In addition, the global fascination with the Internet continues to result in the urgent call to integrate Internet technologies into higher education (King, 2002).

Because emotions are the forgotten key to success in online learning, as De Lera Fernàndez and Almirall (2009) asserted, more research should be conducted to identify both the sources and types of emotions experienced by teachers when they apply ICT in their teaching. How do teachers deal with these emotions? How do these emotions influence their instruction using ICT? To answer these questions, the current practices of ICT by language teachers in higher education should be investigated first, and then the emotions involved in the integrating of ICT should be explored. Moreover, after identifying the emotions involved, the consequences for teachers' of effectively they handle their emotions should also be studied. There is still a relative dearth of studies focusing on the emotions teachers and students often encounter in online learning environments (Kay & Loverock, 2008).

This study invited teachers in the universities of technology in Taiwan to share their experiences and emotional responses in applying ICT in language courses. The following questions are addressed in this study:
1.   What are the current practices of ICT for language teachers in higher education?
2.   What are the emotions involved for teachers in the integrating of ICT into language courses?

LITERATURE REVIEW
The purpose of the literature review is to provide the rationale for the present study. The review first focuses on current ICT practice and then addresses emotions involved in computer-assisted learning in the digital age. The implementation of ICT has become commonplace in higher education. Researchers have widely agreed that ICT

is a helpful aid in language learning. For example, Ogata, Feng, Hada, and Yano (2000) implemented an Internet-based student-centered foreign language education system and proved that it can be used in the instruction and correction of foreign students' compositions. Meskill and Anthony (2005) examined the strategies of teaching a foreign language in a class that integrated computer-mediated communication (CMC) and found the ability to stop online conversations and review the language used to be extremely effective in student learning. Hubackova and Ruzickova (2011) collected feedback from students after conducting a series of ICT-oriented courses. They found that the students responded positively and expressed satisfaction with the contents of the courses.

Language instructors who have included ICT in their teaching have experienced positive results, and the integration of ICT is increasing in education systems. However, foreign language teaching that uses e-learning usually catches on more slowly than the teaching of sciences or technological subjects does (Hubackova & Ruzickova, 2011). The integration of ICT into language acquisition and instruction can be successful if correct strategies are employed. However, instructors and learners may experience negative emotions in the process of adapting ICT. In Laborda and Royo's (2009) research project, a group of senior teachers took part in training for computer-based language tests. By the end of the training, the majority of trainees had reacted positively and was eager to let the research team work with their students. However, they felt they were not capable of using ICT for testing in their classes. This result indicated that teachers might still lack of confidence to use ICT even after they are trained. ICT cannot achieve the maximum effect if the instructor is not confident or does not employ useful strategies.

Using ICT to support English language learning poses challenges for teachers with regard to the effective exploitation of new and emerging technologies. Language teachers should consider new strategies in teaching with ICT; however, ICT per se cannot help teachers in the classroom (Ghasemi & Hashemi, 2011). Therefore, teachers are required to equip themselves with the skills to make effective use of ICT (Kim & Baylor, 2008). However, many instructors are used to teaching without ICT, and many teachers in the field of language learning are not advanced computer users. Moreover, blending a new system into an existing educating system is not an easy task. Bender (2003) suggested that in order to manage online education successfully, teachers should have experience in online instruction, have been an online student at least once, and have guided students in acquiring skills and applying strategies in effective online learning. Thus, the emotions involved in the process of integrating ICT should not be neglected.

Hargreaves (2000, p. 811) emphasized "the importance of the emotions as a field of inquiry for deepening our understanding of the nature, conditions and consequences of teaching, learning and leading in schools today." Lyons, Kluender, and Tetsutani's (2005) study demonstrated that the awareness of our emotional states and those of others can enhance cognitive performance as well as the ability to assess another person's state of mind in a web-based learning environment. Derks, Fischer, and Bos (2008) defined emotion communication as the recognition, expression, and sharing of emotions or moods between two or more individuals. In humans, emotion fundamentally involves physiological arousal, expressive behaviors, and conscious experience (Myers, 2004). Motivations direct and energize behavior, whereas emotions provide the affective component to motivation, whether positive or negative (Gaulin & McBurney, 2003). Emotion directly affects the effects of learning on both the instructor and the students in a learning environment. It is thus important to examine the emotions experiences by the teacher and students during the implementation of ICT in language studies carried out in a classroom or online environment.

Previous studies (e.g., Wosnitza & Volet, 2005) found that emotions in computer-supported learning could derive from the participants themselves, the context, task or technology offered, as well as other people, such as peers and instructors. Ware (2005) indicated that the following factors cause tensions in telecommunication: 1) different expectations and norms for tele-collaboration; 2) social and institutional factors; 3) individual differences in motivation and use of time. He believed the above factors explain the emotional changes in participants during online communication. (2007) pointed out that although technology is a factor in web-based learning environments, the social aspects of the learning situation drive and trigger emotional responses. Nummenmaa (2007) found that "student interaction in the learning environment was mentioned as a cause of emotions more often than the technical environment itself" (p. 41). Students who rarely take part in discussions and do not actively interact with their peers and those who are defined as "lurkers," generally experience negative emotions and become inefficient in their learning in a web-based learning environment.

Both positive and negative emotions can influence students' learning. Negative emotions, such as anxiety, boredom, and hopelessness correlate negatively with interest and effort, whereas positive emotions, such as enjoyment and hope, correlate positively with the motivational variables (Pekrun, Goetz, Titz, and Perry, 2002). When students express emotions, instructors need to respond accordingly in order to keep the students in as

positive a state of mind as possible. Furthermore, in order to teach effectively, instructors have to control their emotions both in the process of becoming accustomed to the new system and in perceiving the emotional responses of students.

However, a challenge researchers might face in collecting emotion-related data surrounding ICT is the difficulty of observation. Nummenmaa's (2007) research also pointed out that because in a web-based learning environment, participation is by computer and discussions are held online, it is difficult to observe and record the emotions of those who are not visible. Researchers must rely on the willingness of participants to reveal their emotions in public. In other words, methods other than self-reports are difficult to utilize. Wosnitza and Volet (2005) suggested several ways to examine learners' emotions in social online learning:

   1. *snapshot type measurement immediately before and/or after the learning process*
   2. *measurement during the learning process*
   3. *stimulated recall measurement after the learning process*

Kay and Loverock (2007) developed a reliable, valid scale to assess the emotions experienced by learners when they used computers. After a detailed review of the relevant literature, they selected four emotions: anger, anxiety, happiness, and sadness.

Emotions can also greatly influence communication in collaborative learning settings. However, no comprehensive and empirically validated theory of emotion is available to date (Picard et al., 2004). Few studies have focused on the emotions teachers and students might experience in an ICT learning environment while engaged in language learning. Hargreaves (2000) indicated that because teaching is an emotional practice, it is important to engage with the emotional arena in education in ways that are critical, and not sentimental or self-indulgent. He also pinpointed that efforts have been made recently to remedy the neglect of emotion in the fields of teaching and teacher development.

In summary, the literature review was instrumental in forming the parameters of this study, which focusses on emotional factors in teachers and students as they shift from traditional educating methods to ICT-supported language instruction.

METHODS
Thirty EFL teachers from universities in Taiwan were invited to answer a questionnaire and six teachers were interviewed. The first part of the questionnaire focused on teachers' attitudes and information literacy (Appendix A). Sixteen items on a five-point Likert scale and one open-ended question were included in the questionnaire to elicit relevant information about how teachers integrate ICT into promoting students' L2 learning in universities of technology. In the first part, items 1–8 were related to attitudes towards ICT integration into language teaching and items 9–16 concerned current practice of ICT in classes.

The second part of the questionnaire concerned emotions involved in the teaching process. Kay and Loverock (2008) developed the emotion scales employed in this study. The scales are based on an extensive review of the literature focusing on the definition of emotions. Four categories of emotions (anger, anxiety, happiness, and sadness) were selected. The category of anger contains three sub-items of emotion: satisfied, excited, and curious. The sadness category includes two kinds of emotions: disheartened and dispirited. The emotion of anxiety includes four different emotions: anxious, insecure, helpless, and nervous. The final category, anger, includes three items: irritable, frustrated, and angry. The teachers in this study were asked to select the emotions they encountered when adopting ICT and provide the contexts of these emotional responses. Finally, the teachers were asked to select reasons that some teachers do not adopt ICT in their language teaching.

The semi-structured interview was conversational and involved open-ended questions (Appendix B) to encourage the teachers to express their ideas. The interview was conducted in both English (for foreign teachers) and Chinese (for Chinese teachers). The interview data were then transcribed, translated, and extracted to triangulate with the other data.

RESULTS AND DISCUSSIONS
The first part of the questionnaire included six five-point Likert-type items; the results are presented in Table 1. Using Cronbach's alpha coefficient of internal consistency, the reliability of the questionnaire was determined at 0.86. The values reached the satisfactory level of ≥0.7 (Nunnally and Bernstein, 1994).

Responses of 'strongly agreed' and 'agreed' were consistently summed. Regarding the teachers' attitudes toward

the use of computer and technology as teaching tools, most teachers answered positively to the items on the questionnaire: 82.3% of the teachers agreed that their schools offered sufficient information about technology equipment for instructors to apply in teaching; 67.6% agreed that schools provided clear targets for instructors; 47.1% of the teachers agreed that their motivation to use technology in teaching was affected by whether their colleagues would assist them. In addition, over 65% of the teachers surveyed confirmed that utilizing information technology in teaching enriched their lessons, improved their quality of teaching, and increased the students' interactions in learning English. Similarly, 70% of the teachers agreed that technology increased their students' motivation in learning English.

Table 1. Results indicating teachers' attitudes and current practice of ICT

Item (1)Information literacy and attitude of instructor	SA	A	SA	D	SD	M	Standard D
1. My school offers sufficient information technology equipment for instructors to apply in teaching.	38.2	44.1	17.6			4.21	.729
2. My school provides clear targets for instructors to use information technology in teaching.	17.6	50.0	23.5	8.8		3.76	.855
3. My willingness to use information technology in teaching is affected by whether I receive assistance from colleagues.	11.8	35.3	17.6	32.4	2.9	3.21	1.122
4. I think the use of information technology enriches the content of teaching.	50.0	38.2	8.8	2.9		4.35	.774
5. I think the use of information technology to assist English teaching raises the teaching quality.	41.2	38.2	11.8	8.8		4.12	.946
6. I think the use of information technology increases the interaction in class.	38.2	26.5	23.5	11.8		3.91	1.055
7. I think the use of information technology raises the students' willingness to learn English.	23.5	47.1	20.6	8.8		3.85	.892
8. I often take parts in seminars or lectures to improve my ability to use information technology.	17.6	26.5	38.2	17.6		3.44	.991
9. I often use my own teaching website to help students learn English because students can interact at any time.	5.9	14.7	26.5	38.2	14.7	2.59	1.104
10. I often use the school's teaching website to help students learn English because students can interact at any time.	11.8	20.6	26.5	35.3	5.9	2.97	1.141
11. I often use YouTube in class as it provides videos from actual scenarios.	26.5	17.6	29.4	17.6	8.8	3.35	1.300
12. I often use briefings to teaching because the visual information provides helps the students to learn.	38.2	38.2	8.8	14.7		4.00	1.044
13. I often use Facebook to teaching because it offers real time discussion.	5.9	14.7	17.6	35.3	26.5	2.38	1.206
14. I often use internet forums to teaching because it offers interactive discussions.	5.9	5.9	23.5	38.2	26.5	2.26	1.109
15. I often use email to teaching as I can have a complete record of sending and receiving.	2.9	38.2	14.7	29.4	14.7	2.85	1.184
16. I often use teaching software (e.g., ebook, automatic feedback software) in teaching because self-directed learning is available at any time.	5.9	14.7	35.3	32.4	11.8	2.71	1.060

However, in Item 8, only 44% of the teachers expressed that they would take part in seminars or lectures to improve their technological abilities. Fewer teachers noted that they would construct their own websites to help students learn English (less than 21% agreed): 32% of the teachers agreed that they would use the teaching websites constructed by the school to help their students learn English; 44.1% of the teachers agreed that they would use YouTube in their teaching; 76.4% of the teachers claimed that they would often use presentation software in their instructions. Fewer teachers would combine Facebook and social forums with their teaching, at 20.6% and 11.8% respectively. Email was more commonly used by these teachers (41.1%), whereas only 20.6% agreed that they would combine other teaching software, such as ebook and automatic feedback software, with their teaching.

The results showed that although the teachers had positive attitudes towards ICT integration, when it came to current practice, the percentages decreased except in the use of YouTube and PPT, which were the two most frequently adopted ICTs in language learning observed in this study. In the interview, most teachers agreed that the incorporation of technology into their courses was meaningful and emphasized the importance of using technology properly to achieve effectiveness in class. The following two excerpts are examples:

I personally feel it's effective, and the main effect is that it makes our teaching more diversified and abundant.

It's a tool, so it depends on how you use it and whether you use it properly. If you integrate it properly, your courses can be effective.

It can be inferred that teachers have positive attitudes toward ICT integration, but they are reluctant to use the technology in language courses. As Hall, Fisher, Musanti, and Halquist (2006) indicated, most teachers tend to teach students in the same way they were taught. Cox, Preston, and Cox (1999) also stated that teachers did not expect that more training would improve their practice after they had finished their initial training. Unal and Ozturk (2012) found that teachers lacked sufficient knowledge about innovative ICT-based instructional methods and practices to create a fundamental change in their teaching approaches and practices. A possible explanation was found in the responses to the second part of the questionnaire.

The second part of the questionnaire concerns the reasons that instructors might not use information technology in teaching (Table 2). Seventeen teachers suggested that some instructors might lack the ability to use the technology. Sixteen teachers felt that it might be because the instructor lacked preparation time, or they felt that it would be difficult to maintain class discipline. Nine teachers felt that the reason might be that the instructor did not think the technology could help with teaching and that the proposed technology was not necessary in language teaching. Concerning the latter, the responses were that the technology may not be needed for the content of the class, the technology is only an aid, not the focus of the class, and the technology may not be suitable in beginner or intermediate classes.

Table 2. Reasons why teachers do not use ICT

Items	Frequency	Reasons
1	17	Lack of ability to use technology
2	16	Difficult to maintain class discipline
3	12	Instructor did not think that the technology can help with teaching or that technology is necessary for language teaching
4	16	Lack of preparation time
5	15	Lack of related software or resources
6	13	Lack of information about technology training
7	9	Lack of support for using information technology or the assistance from administrative departments

Sixteen teachers felt that it might be because the instructor lacked preparation time, or felt that it would be difficult to keep the class discipline. Nine teachers felt that the reason might be the instructor did not think the technology could help with teaching and that the proposed technology was not necessary in language teaching. Concerning the latter, the responses were that technology may not be needed for the content of the class, technology is only an aid, not the focus of the class, and the technology may not be suitable in beginner or intermediate classes. Fifteen teachers noted that it might be because of the lack of related software or the difficulty in borrowing resources from the school. Thirteen teachers felt that it might have resulted from the lack of information about technology training for the instructor, and nine teachers commented that it might be because the instructor lacked support in using information technology or assistance from administrative departments.

The above results supported previous findings (e.g. Bingimlas, 2009; Marti, 2006) that that barriers to the successful integration of ICT in teaching and learning environments included individual (teacher-level barriers) and institutions (school-level barriers). Items 1–3 in Table 2 concern teacher-level barriers, and items 4–7 are about school-level barriers. Bingimlas (2009) indicated that the lack of confidence and competence were two critical components of ICT integration in schools. Earl (2002) and Marti (2006) also found that teacher expertise in ICT use was one of the driving or resisting forces. In the present study, Item 3 was related to teachers' negative attitudes and their inherent resistance to change, which is regarded as a significant barrier to ICT

integration (Bingimlas, 2009; Empirica, 2006; Richards, 2005). When teachers do not recognize the benefits of ICT, they show no desire to change their professional practice.

Regarding school-level barriers, Becta (2004) reported that some teachers stated that some aspects of ICT required more time to prepare traditional lessons (Earl, 2002; Sicilia, 2005; Trucano, 2005). The poor accessibility of relevant software and hardware was another constraint in ICT integration. With regard to the lack of information about technology training, researchers suggested that it is crucial to provide training for teachers to develop the pedagogical aspects of ICT, and not only focus on teachers' ICT skills (Beca, 2004; Cebrian, 2003; Cox, Preston, & Cox, 1999; Gisbert, 2001). Furthermore, poor administrative support will discourage the meaningful application of ICT in language courses.

The third part of the questionnaire related to the emotions involved when teachers adopt ICT in language courses.

Table 3. Emotions expressed by teachers

Category	Emotions	Frequency	Examples
Happiness (32)	1. Satisfied	20	*1. The students have strong learning motivation, and are willing to learn actively.* *2. The information is new, lively, and active.*
	2. Excited	9	*1. always find some new invention* *2. Some contents advance with time; I can often learn something new.*
	3. Curious	3	*1. a lot of resources* *2. much to learn*
Sadness (11)	4. Disheartened	4	*1. The students are not attentive to make notes, or they never go online to search for key points.* *2. unstable and unreliable system*
	5. Dispirited	7	*1. The school's information technology system is messy; there is no way to integrate it.* *2. The reaction from students may not be as good as expected.*
Anxiety (22)	6. Anxious	8	*1. I am not familiar with technology* *2. When the information is not conveyed clearly or when the system froze.*
	7. Insecure	7	*1. I am not familiar with this software and how to apply it to school work.* *2. The system sometimes fails to start, or it sometimes freezes; it makes me feel worried.*
	8. Helpless	5	*1. The school does not maintain the systems in time.* *2. When the machine fails to work, I cannot fix it myself.*
	9. Nervous	2	*1. Unfamiliar* *2. I am afraid that the computer may fail to work*
Anger (16)	10. Irritated	5	*1. Sometimes the machines are not cooperative, and the internet is too slow* *2. Because the internet and technical problems may influence teaching quality without warning; for example, some classrooms installed trial software, some classrooms don't have them, and so the time may be delayed or we need to use more time to seek help from technicians.*
	11. Frustration	6	*1. equipment failure can waste time* *2. I am not adept with using information technology, and not skillful enough in computers.*
	12. Angry	5	*1. The school equipment may break without warning and it may influence the teaching schedule.* *2. Sometimes I announce something, some students still fail to do them*

Twenty teachers noted that they are often satisfied with their use of technology in English lessons. They

expressed that the students were more willing to respond, had higher learning motivations, and had better concentration and interaction. They also suggested that using technology in teaching is more convenient and immediate. Similarly, nine teachers claimed that they were excited to use technology in their teaching, since they could also learn new techniques and knowledge in the process. In addition, three teachers highlighted that they would be curious about using the technology as they feel that there was much to learn and many resources to utilize.

In contrast, four teachers felt disheartened about using technology in English classrooms because the students might not take notes or be uninterested. In addition, the system might be unstable with no access to the internet. Teachers also experienced discouragement in using technology. Seven teachers stated that they were discouraged because sometimes the performance of the technology and the response from the students was not as good as expected. The school's information platform might be too messy to sort, and the students might feel that the information presented was too easy.

Eight teachers suggested that they would feel anxious about using information technology in their class. They stated that they were not familiar with the technology and had experienced of sudden failures of equipment. Seven teachers shared a feeling of insecurity about bringing technology into their English classrooms as they were not familiar with the technology and were afraid of encountering problems with the system. Similarly, two teachers commented that they would feel nervous when using technology while teaching because they were unfamiliar with the equipment and feared that the computer would not work. Because of equipment failure and lack of technical support, five teachers felt helpless when adopting technology in classrooms.

Similarly, five teachers were often irritated by technology in English classes because the computer and the equipment were problematic, and it took time to get assistance when the equipment failed to work. Frustration resulted from the experiences of six teachers with equipment failures and lack of ability with computers. Five teachers claimed that they felt angry at times when they used technology because if it suddenly failed to work, the class schedule was delayed. Furthermore, such delays distracted the students from the tasks at hand.

The results of the interview provided relevant information. Regarding the emotions that the teachers may encounter during the incorporation of technology into their classes, they stated that before using the technology in their courses, they would feel excited, nervous, and anxious as exemplified in the following excerpts.

> When I am bringing it in, I would feel mostly excited, because I want to try to see the students' preferences or skills, so when I start I feel more excited.

> You're nervous because you're not sure if it can work. You worry students gonna like it or understand it, you worry that there'll be typical problem which I can counter.

> The anxiety to new materials on one side is the time spent on it; teachers have to be familiar with it and so they have to spend more time. So the first one is the concern for time, the second one is task difficulty.

Other teachers claimed that worries and anxiety could be experiences before taking technology into the classroom because it entailed the adoption of new materials.

The teachers' emotions shifted to frustration or anxiety, which resulted from something that did not work in the process of applying the technology. Teachers may cope with these emotions by being prepared before class and reflecting after class on what did not work. Teachers expressed how they tried to feel less anxious as follows:

> I need to be familiar with my teaching materials; second, I might need to go to the classroom environment to go through it, to make sure there is no problem. I need to lower my anxiety, and when I am prepared, I can lower my anxiety.

> Sometimes when I am more frustrated, I would think back after class, and do some reflections. I would think about what part went wrong, or what part I did better or need improvement, and I would adjust based on those parts.

With regard to coping with students' emotions in class when using technology, some teachers suggested that being prepared and explaining to the students about what to do was important. One teacher reported the following:

I try to alleviate their worries by explaining things, showing things, them how to use that, giving examples.… I guess I try to teach them how to avoid these kinds of things, but if there is a computer problem, I just move on something else then come back to it later which kind of through this class of a little bit but they must can do better. So try to be prepared with the backup.

Another teacher echoed the latter part of what the previous teacher said, saying:

If we have no connections to the Internet, we would find backup plans. We may skip this section today and not let students just idle and wait.

Teachers also provide several suggestions for teachers would wish to bring technology into their classrooms. Numerous teachers think that it is a positive thing to incorporate technology in courses, and it's the trend of the future.

It's an unavoidable trend. We believe that technology will continue to innovate, continue to become use friendly; the difficulties we face now may be simplified and made easier.

However, some teachers also warned about the use of technology.

Technology is still a tool for teaching. One doesn't have to be controlled by the technology.

Teachers have to think about what the students are capable of doing. They have to think about what is available to them, what they can use, what they should use and try to learn more about it and feel comfortable doing this before the implementation of ICT.

Desjardins and Peters (2007) suggested that future teachers should embrace the idea of becoming lifelong learners and keep up with the pace of technological innovation and integration. They would thus become as autonomous and constructive in learning processes as their future students would be.

CONCLUSIONS AND SUGGESTIONS

The results of this study revealed that for the most part, the instructors had positive attitudes when they approached the implementation of ICT in their classes. However, a gap exists between the extent to which teachers enjoy using technology and the degree to which they use the technology in their classes. The most common communication tools used by teachers are PPT presentations and YouTube. Fewer teachers used common social websites such as Facebook. It was observed that currently, teaching websites and software are not commonly used by teachers in classes.

It can be inferred that teachers have positive attitudes toward integrating ICT integration but they are reluctant to use it in language courses. Previous research indicated that teachers lacked proper training and adequate knowledge to make use of ICT. The present study sought answers directly from the instructors. The results indicated two types of burdens: on the individual (i.e., the teacher) and on the institution. On the individual level, some teachers felt that they did not have sufficient knowledge about the technology, found it difficult to maintain class discipline, or had insufficient preparation time. In addition, a few participants did not find it necessary to introduce ICT into their curriculum. On the institution level, the school might not provide enough training, equipment, and support for the implementation of ICT.

Regarding the emotions expressed by teachers, most were satisfied with and excited about their utilization of ICT. Some were also curious about how ICT could improve language instruction. Some negative emotions included dispiritedness, anxiety, and insecurity. Frustration, anger, irritation and helplessness were also expressed. The negative emotions often resulted from unexpected responses, student performance, or the technological equipment.

The major difficulty faced in the study is that although ICT is a growing trend, its current practice is still not widespread enough to yielding significant amounts of data for observation. Because each school has a specific budget and policies, the standards of ICT application can differ from case to case. The willingness of teachers to use ICT in courses also varies. Research could gather more relevant data and produce more comprehensive results when the utilization ICT implementation increases in the near future. Hence, schools and faculties can be interviewed as subjects.

The research revealed positive attitudes of the teacher participants towards the incorporation of technology in

language courses. They agreed that ICT is the trend of the future. Instructors were recommended to prepare by familiarizing themselves with the system that they will be using. Teachers play the role of not only instructors but also learners in keeping pace with technological innovation and integrating technology to provide useful, efficient and adequate materials and tools for students. Teachers should also have alternate lesson plans in case the ICT equipment malfunctions. Finally, instructors should consider the students' perspective and be aware of what is available, what can be used, and what should be used. In order to succeed in the implementation of ICT, teachers need to gain the knowledge and skills that would increase their levels of comfort and confidence in using this technology.

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Appendix
Research Questionnaire

Dear Instructor:

Thank you for taking part in the 2012 National Science Council's questionnaire regarding the emotions involved in the integration of ICT to English teaching and learning. The purpose of this questionnaire is to understand the current status of the application of information technology in language education. Please answer all the items below and place a checkmark in the appropriate box □. All of the data collected are anonymous and will be used for academic research only. Thank you for your time.

1.   Contents

Item **(1) Information literacy and attitude of the instructor**	SA	A	SA	D	SD
1. My school offers sufficient information technological equipment for instructors to apply in teaching.	□	□	□	□	□
2. My school provides clear targets for instructors to use information technology in teaching.	□	□	□	□	□
3. My willingness to use information technology in teaching is affected by whether I receive assistance from colleagues.	□	□	□	□	□
4. I think the use of information technology enriches the content of teaching.	□	□	□	□	□
5. I think the use of information technology to assist English teaching raises the quality of teaching.	□	□	□	□	□
6. I think the use of information technology increases interaction in class.	□	□	□	□	□
7. I think the use of information technology increases the students' willingness to learn English.	□	□	□	□	□
8. I often take part in seminars or lectures to improve my ability to use information technology.	□	□	□	□	□
9. I often use my own teaching website to help students learn English because students can interact at any time.	□	□	□	□	□
10. I often use the school's teaching website to help students learn English because students can interact at any time.	□	□	□	□	□
11. I often use YouTube in class as it provides videos of actual scenarios.	□	□	□	□	□
12. I often use briefings in teaching because the visual information provided helps the students to learn.	□	□	□	□	□
13. I often use Facebook in teaching because it offers real time discussion.	□	□	□	□	□
14. I often use internet forums in teaching because they offers interactive discussions.	□	□	□	□	□
15. I often use email in teaching because it provides a complete record of sending and receiving.	□	□	□	□	□
	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
16. I often use teaching software (e.g., ebook, automatic feedback software) in teaching because self-directed learning is available at any time.	□	□	□	□	□

17. Other:

(2) The reasons instructors do not use information technology (multiple selections accepted)

□The instructor does not have sufficient time to prepare.
□The instructor lacks support for using information technology.
□The instructor does not think that information technology helps in teaching.
□The instructor lacks the abilities necessary for using information technology.
□The instructor lacks relative information or information technology training.
□The instructor lacks assistance from administrative departments.
□The instructor thinks that it is difficult to maintain discipline in class.
□The instructor thinks that the students lack related information about technological abilities.
□The school lacks related teaching software.
□It is difficult to borrow or keep related resources (e.g., user manuals and troubleshooting material).
□Other:_____

(3) The emotions of instructors using information technology: Please check the emotions you often experience when using information technology in English classes, and describe the learning environment and the reasons for the emotion.

□1 I often feel Satisfied because:

□2 I often feel Disheartened because:

□3 I often feel Anxious because:

□4 I often feel Irritable because:

□5 I often feel Excited because:

□6 I often feel Discouraged because:

□7 I often feel Insecure because:

□8 I often feel Frustrated because:

□9 I often feel Curious because:

□10 I often feel Helpless because:

□11 I often feel Nervous because:

□12 I often feel Angry because:

□13. I often feel other emotions because:

Thank you again for your time and assistance

Appendix II
Interview questions for university teachers

1. Do you think that the integration of ICT into English courses is effective? Why or why not?

2. What emotions have you encountered before/during/after the integration of ICT into English courses? When and why? How do the emotions influence your teaching (e.g., give up the integration of ICT into English courses or adjust ways to integrate ICT into English courses)

3. How do you cope with your emotions?

4. How do you cope with students' emotions that result from the integration of ICT into English courses (e.g., impatient, anxious, or bored)? Please give examples.

5. Please give suggestions to teachers who are interested in the integration of ICT into English courses in higher education:

THE EFFECTS OF KOREAN LEARNERS' ONLINE EXPERIENCES ON THEIR ENGLISH WRITING

Chanho Park
Assistant Professor, Keimyung University.

 Sookyung Cho
Assistant Professor, Department of English Linguistics, Hankuk University of Foreign Studies
sookyungcho@hufs.ac.kr

ABSTRACT
This study aims to examine the effects of the online writing experiences of English as a foreign language (EFL) learners on their self-efficacy, attitudes, and performance in a computer-mediated writing classroom (CMC). Although the close relationship between students' computer experiences and class performance has been positively confirmed in many studies, it has rarely been examined in the context of an EFL writing course. In this study, two groups of Korean university EFL learners, regular (15) and non-regular (17) online writers, were compared regarding their self-efficacy, attitudes, and the extent to which they incorporated online peer feedback into revision. The results reveal that regular online writers, in comparison with non-regular online ones, are likely to have more positive attitudes towards CMC and to incorporate feedback into revision more successfully and extensively. This finding implies that the introduction of a new technology should be accompanied with extra assistance and device to those who are not familiar with the technology.

INTRODUCTION
The use of computers and the Internet is indispensable for students living in this era of information and communication technology (ICT). Students' computer-related knowledge and experiences are reported as positively influencing their attitudes toward computer-mediated learning (Chen, 1986; Levin & Gordon, 1989; Mitra, 1998; Topkaya, 2010). Students who frequently use ICT—such as word-processing, emailing, blogging, and online message posting—are likely to put more effort into accomplishing technology-related tasks and will, in the end, perform better than those who use ICT less frequently (Bandura, 1995; Karsten & Roth, 1998; Lee, 1986; Muira, 1987; Rozell & Gardner, 1999, 2000). These studies clearly demonstrate that student's experiences with computer use affect their attitudes toward the use of computers in class and even their performance.

In spite of the many studies illustrating the positive effects of ICT on learning, few studies have examined how second language writers' online writing experiences affect their self-efficacy, attitudes, and performance in second language writing. Thus far, studies have focused on the effects of computer-mediated classes (CMCs) that incorporate the use of computers into their curriculum in a variety of ways, such as local area networks, bulletin boards, email, or instant chat (Braine, 2001; Chang, 2012; Chen, 2012; Hewings, & Coffin, 2006; Ho & Savignon, 2007; Liu & Sadler, 2003; Sullivan & Pratt, 1996). While focusing on the differences between traditionally-taught classes and CMCs, these studies have not taken into account students' previous experiences using computers. As shown in classes other than a writing class, however, students' previous computer experiences may play an important role in establishing their positive attitudes toward CMC writing activities and even improving their performance in a writing class. Thus, this study aims to investigate how online writing experiences affect students' self-efficacy, their attitudes toward the use of ICT in class, and finally their performance—that is, in revising drafts in a second language writing class.

LITERATURE REVIEW
COMPUTER EXPERIENCES, SELF-EFFICACY, AND PERFORMANCE
Computer experiences seem to play an important role in establishing students' self-efficacy in ICT. Self-efficacy is "the belief about one's own capability to organize and complete a course of action required to accomplish a specific task" (Eggen & Kauchak, 2007, p. 310). After examining 288 pre-service English language teachers' perceptions of computer self-efficacy, Topkaya (2010) discovered that previous computer experiences affected their perceptions of computer self-efficacy positively. İŞman and   elikli (2009) also found that self-efficacy positively affects students' motivation as well as task performance in using computers. Furthermore, this self-efficacy seems to depend on students' years of computer use in addition to the complexity of the task.

Not only do the students who have used computers tend to have a high level of self-efficacy in ICT, but they are

also likely to have more positive attitudes toward the use of computers in class (Chen, 1986; Levin & Gordon, 1989; Mitra, 1998). While investigating gender differences in the relationship between computer experiences and attitudes toward computers, both Chen (1986) and Levin and Gordon (1989) found positive effects of prior computer experiences on attitudes. Although male high school students had more experiences and more positive attitudes with regard to using computers than their female counterparts, Chen found that male and female students seemed equally interested in computers, when their prior computer experiences were controlled for. In other words, prior computer experiences made a difference in attitudes toward the use of computers between genders. Levin and Gordon found that prior computer experiences seemed to work as a stronger predictor of attitudes among Israeli secondary students than gender. Mitra similarly found strong relationship between students' prior computer experiences and attitudes toward computers among 1,444 university students. Those who reported higher use of computers had a more positive attitude toward computers than lower users of computers.

Moreover, prior computer experience seems to affect students' class performance as well as their self-efficacy and attitudes (Karsten & Roth, 1998; Lee, 1986; Rozell & Gardner, 1999, 2000). Through investigation of various factors affecting computer-related performance, Rozell and Gardner (1999 and 2000) found that students' computer experiences have a close relationship with their computer-related performance. Lee uncovered the effects of past computer experiences on computerized aptitude test performance. Karsten and Roth found a relationship between computer experiences and self-efficacy regarding students' performance in introductory computer literacy courses, showing that relevance rather than quantity of experiences is most predictive of students' performance in class. That is, whether students' computer experiences directly relate to the task in class is a better predictor of students' success in class than how much computer usage they have experienced.

While student experience with computers has been reported to have a close relationship with their computer self-efficacy, attitudes toward CMC, and eventually their performance levels, this relationship has rarely been explored in the area of writing instruction to EFL learners. Thus far, most studies on the use of computers in second language writing classrooms have examined the differences between traditional and computer-mediated classrooms regarding students' attitudes (Chen, 2012; Ho & Savignon, 2007; Sullivan & Pratt, 1996), apprehension level (Sullivan & Pratt, 1996), writing quality (Braine, 2001; Sullivan & Pratt, 1996), interaction pattern (Brain, 2001; Hewings, & Coffin, 2006; Liu & Sadler, 2003; Sullivan & Pratt, 1996), amount of feedback incorporated into revision (Liu & Sadler, 2003), task engagement, comment categories, and perception of peer review (Chang, 2012). However, no studies have investigated how the actual computer-mediated writing experiences in daily life affect EFL students' computer self-efficacy and attitudes toward computer-assisted classroom or the effects of prior computer experiences on students' actual performance in a writing class.

Therefore, this study aims to investigate how Korean students' online experiences affect their self-efficacy, attitudes toward CMC, and performances in an EFL writing class. In this study, the participants are divided into two groups; those who regularly wrote online are named "regular online writers," and those who had irregular or no experiences of online writing are labeled as "non-regular online writers." Then the differences between regular and non-regular online writers on self-efficacy and attitudes toward CMC are examined. In addition, the two groups are compared regarding their performance, which is measured by the extent to which they successfully incorporated peer feedback into revision. Peer feedback has been actively utilized in both first and second language writing classrooms, based on the theoretical underpinning that peer feedback helps build a strong sense of audience by providing students with chances to experience readers other than their teachers (Kroll, 1991; Nystrand, 1986; Vilamil & De Guerrero, 1996; Zamel, 1985). This study is designed to answer the following questions:

1. How different are regular and non-regular online writers from each other in computer self-efficacy?
2. How different are regular and non-regular online writers from each other in attitudes toward CMC?
3. How different are regular and non-regular online writers from each other in their performance, or the extent to which they successfully incorporate online peer feedback into revision?

METHODS
PARTICIPANTS
The participants were 32 Korean college learners of English (16 males and 16 females) enrolled in intermediate-level writing classes taught by one of the authors. Table 1 shows the background information of the participants. Their mean age was 23.46 with a standard deviation (SD) of 3.90. All participants had completed a basic writing course as a prerequisite, and as English majors or minors, their English proficiency levels were generally high. Twenty-four out of the 32 students had standardized English test scores. Since the majority of the students took the Test of English for International Communication (TOEIC), other test scores were converted to TOEIC scores.

The mean score was 915.83 with an SD of 60.55, which is a highly advanced level of achievement considering the TOEIC scale of 10 to 990. Although some students did not have English test scores, they had similar English proficiency as the other students. Also, many students had experiences of living in English speaking countries, such as the USA, the UK or Australia, with a mean of 5.44 months and an SD of 11.50.

Table 1: Descriptive statistics of English proficiency and online writing frequency

	N*	Min	Max	Mean	SD
Age	28	20	39	23.46	3.90
English Proficiency**	24	800	990	915.83	60.55
Living Abroad***	27	0	36	5.44	11.50

* Size varies due to number of responses
** Scores converted to the TOEIC scale
*** Months of living in English speaking countries

ONLINE WRITING EXPERIENCES
It was hypothesized that regular online experiences would affect computer self-efficacy and attitudes toward using online tutoring aid tools in an English writing class, and would further help improve their writing by their selective incorporation of good peer feedback. It was thus important to examine whether the participants were used to the practice of regularly expressing their views or opinions to other people via online media. Therefore, depending on whether they self-reported as being regular online writers or not, participants were divided into two groups. Online writing activities included personal essays such as writing or responding to blog posts, but text messages using a short message service were excluded.

Fifteen out of 32 students were categorized as regular online writers while the remaining 17 students were non-regular online writers. The effects of how often they write were not investigated, and thus only the descriptive statistics of the frequency of online writing activities per week by regular writers are shown in Table 2. The mean and SD were 5.23 and 2.41, respectively. The regular online writers wrote at least three, but up to ten, times per week.

Table 2: Descriptive statistics of online writing activities by regular writers

N	Min	Max	Mean	SD
15	3	10	5.23	2.41

To ensure comparability between groups, the two groups were examined for gender, age, English proficiency, and months living in English-speaking countries. There were eight males and seven females in the regular group while eight males and nine females, resulting in no significant differences between the two groups for gender ($\chi^2(1) = .125$, $p = .723$). Table 3 shows the results of *t*-tests between the regular and the non-regular online writing groups on three variables (i.e., age, English proficiency, and the months of living in English speaking countries), and no statistically significant differences were observed. Therefore, it was concluded that the two groups were comparable except for whether they write online regularly or not.

Table 3: Results of *t*-tests on age, English proficiency, and living abroad

Variable	Mean (SD) of Regular Group	Mean (SD) of Non-Regular Group	t (df)	p
Age	22.93 (2.56)	24.00 (4.95)	-.72 (26)	.48
English Proficiency	900.91 (70.60)	928.46 (49.97)	-1.12 (22)	.28
Living Abroad	9.42 (14.78)	1.15 (3.36)	1.97 (25)	.06

SELF-EFFICACY AND ATTITUDE
The participants were requested to answer two sets of questions, shown in Table 4. The first five questions investigated students' self-efficacy of using the online blackboard, and the last five inquired into students' attitude toward the use of the online blackboard in class. Students responded on a six-point Likert scale anchored from "Strongly Disagree" to "Strongly Agree." Once evidence of reliability and validity was obtained for the

questionnaire, students' mean responses to the self-efficacy and attitude questions were used as measures of self-efficacy and attitude, respectively.

Table 4: Questionnaire items for measuring self-efficacy and attitude

Category	Question
Self-Efficacy	I can upload and download writing assignments and feedback online.
	I can provide peer feedback via online.
	I can incorporate peer feedback into the revision.
	I can see writing assignments of other group members.
	I can see peer feedback given to other group members.
Attitude	Online activities were helpful for writing and submitting writing assignments in this class.
	Online activities were helpful for giving and receiving peer feedback in this class.
	Online activities increased my motivation for studies in this class.
	Online activities in this class were helpful in improving my writing ability.
	I think positively of the online activities in this class.

QUALITY OF REVISION

The participants submitted three writing assignments during the semester, with two drafts of each assignment. After uploading each first draft, the students worked with two group members assigned by the instructor, giving and receiving feedback via the online class blackboard. Students revised first drafts, selectively incorporating feedback, and posted the final draft within one week. Prompted by the questions on the given worksheet (see Appendix for the sample worksheet), the peer comments usually included both suggestions for improvement and compliments for well-executed elements of their writing.

Obviously, all peer comments do not necessarily lead to improved revision; some, in fact, may worsen the manuscript. It was thus important that the students first selected "good" feedback and then improved their draft by incorporating the good feedback. In order to see to what extent each of the participants successfully incorporated peer feedback into their revision, the participants' first and revised drafts were compared and contrasted with the peer feedback received. Although, drawing on Wolcott (1994), the number of comments incorporated into the revision was often calculated in the studies that investigated students' revision processes (Liu & Sadler, 2003), this study measured the number of words triggered by peer feedback. As seen in the Appendix, peer feedback was conducted in a controlled fashion, meaning that only certain types of feedback (clarification and suggestion) were used, resulting in a limited number of peer comments. Instead of categorizing the types of feedback and the frequency of its incorporation into revision, this study concentrated on the amount of revision tried by a particular peer feedback: out of the total number of revised words, the percentage of the number of effectively-revised words triggered by peers was calculated for each writing assignment of each participant.

DATA ANALYSIS

The data analysis procedures were as follows. First, Cronbach's alpha was computed as a reliability estimate of the questionnaire, while a factor analysis (FA) was conducted to check validity (Crocker & Algina, 1986). The two groups (regular vs. non-regular online writing groups) were then compared for comparability of age, English proficiency, and experiences of living in English-speaking countries. After confirming that the two groups were similar, the groups were compared for self-efficacy and attitude. Finally, a multivariate analysis of variance (MANOVA) was conducted to compare the two groups on the quality of revisions for the three writing assignments. All statistical analyses were conducted in R (R Development Core Team, 2013).

RESULTS
RELIABILITY AND VALIDITY
Table 5 shows Cronbach's alpha for self-efficacy and attitude (.874), which indicates that the questionnaire was reliably measuring self-efficacy and attitude.

Table 5: Cronbach's alpha

Section	Cronbach's alpha
Self-Efficacy	.874
Attitude	.874

To check the construct validity of the questionnaire, an FA was conducted. Since the number of participants was not sufficient for a confirmatory FA, an exploratory FA was conducted by fixing the number of factors at two. Factor loadings after promax rotation are shown in Table 6, where factor loadings larger than .3 are highlighted. All factor loadings of self-efficacy on Factor 1 are larger than .3, while those on Factor 2 are smaller than .3. Also, all attitude items on Factor 2 are larger than .3 with only an exception of Item 2, whose loadings are larger than .3 on both factors. Therefore, Factor 1 can be labeled as "Attitude" and Factor 2 as "Self-Efficacy," and construct validity of the questionnaire can be confirmed.

Table 6: Factor pattern matrix with Promax rotation

Section	Item	Factor 1	Factor 2
Self-Efficacy	No. 1	.48	.27
	No. 2	.46	.22
	No. 3	.99	-.22
	No. 4	.97	.02
	No. 5	.91	-.11
Attitude	No. 1	.16	.79
	No. 2	.53	.44
	No. 3	-.15	.84
	No. 4	-.00	.78
	No. 5	-.06	.84

SELF-EFFICACY AND ATTITUDE
The means and SDs of self-efficacy and attitude by both regular and non-regular groups are shown in Table 7. Note that the measures of self-efficacy and attitude were mean responses to the five items on the six-point Likert scale. It can be seen that self-efficacy was very close to the highest category (Strongly Agree) for both groups.

In order to separately investigate whether the two groups differed on self-efficacy and attitude, two t-tests were conducted instead of a MANOVA. The nominal type I error rate was modified to .025(=.05/2) for Bonferroni adjustment. Results showed that the regular online writing group had a significantly higher attitude score than the non-regular group (t(30)=2.59, p=.01). Although the difference of self-efficacy between the two groups was not significant (t(30)=-.08, p=.94), such results could easily be expected because both groups showed high levels of self-efficacy (see Table 7).

Table 7: Results of t-tests on self-efficacy and attitude

Variable	Mean (SD) of Regular Group	Mean (SD) of Non-Regular Group	t (df)	p
Self-Efficacy	5.56 (.57)	5.58 (.59)	-.08 (30)	.94
Attitude	5.20 (.89)	4.49 (.64)	2.59 (30)	.01

QUALITY OF REVISION
A MANOVA was conducted to examine whether the two groups were significantly different from each other in the extent to which they successfully incorporated online peer feedback into their revisions. The result was significant (Wilks' Lambda= .56, F(3, 17)=4.38 , p=.02), indicating the regular online writing group was significantly better than the non-regular group in incorporating "good" peer feedback into their revised drafts (Table 8).

Table 8: Results of MANOVA on Quality of Revision

Variable	Mean (SD) of Regular Group	Mean (SD) of Non-Regular Group	Wilks' Lamda	F (df)	p
Assignment 1	26.77 (18.49)	10.17 (13.09)			
Assignment 2	22.16(17.74)	3.19(8.11)	.56	4.38 (3, 17)	.02
Assignment 3	17.82 (26.11)	2.10 (3.57)			

DISCUSSION AND CONCLUSION

The purpose of this study was to investigate the effects of online writing experiences on self-efficacy, attitude, and performance. To that end, participants, divided into regular and non-regular online writing groups, were shown to be comparable in all tested parameters except for their online writing experiences. Participants' self-efficacy and attitudes were measured using a questionnaire, with the regular online writing group showing significantly higher levels of positive attitude than the non-regular group. Although the results may not show a causal relationship between online writing experiences and attitudes toward ICT, this study confirms the positive effects of frequent online experiences on attitude in a second language writing classroom (Chen, 1986; Levin & Gordon, 1989; Mitra, 1998).

The differences between the regular and non-regular groups regarding self-efficacy were not significant, but the effects of online experiences on self-efficacy should be explored further. The insignificant results may be explained by "ceiling effects." Since the Internet is now ubiquitous, almost all participants showed full self-efficacy in using the web. , Nonetheless, further research is needed to examine the relationship between self-efficacy and mobile technology, which is less common but is being increasingly used in classrooms (Franklin, 2011).

Finally, by comparing regular and non-regular online writing groups, it was found that regular online writers were more active in improving their writing drafts with peer assistance. Students selected "good" peer feedback and incorporated it into their revision. Growth in second language writing is affected by many factors, and it is difficult to show that regular online writers grew more than non-regular writers in every aspect of writing. However, it is certain that regular online writers are likely to pay attention to peer feedback provided online and, as a result, be more likely to incorporate it into their revision for improvement of their drafts. This positive effect of students' online writing experiences on their willingness to accept peer feedback confirms the speculations of several scholars who argue that online environments foster a greater sense of audience by enabling learners to acknowledge that they have other audiences in addition to the teacher (Hawisher, 1992; Schriner & Rice, 1989; Spitzer, 1990).

In this study, the use of computer strengthens the original purpose of peer feedback, that is, to enhance the sense of audience, by enlarging the community of writers in a second language writing classroom. However, the finding of this study—that students' online experiences play an important role in establishing this sensitivity to audience among students—implies that students may not automatically benefit from CMC. Whether students can benefit from the incorporation of a particular technology in class depends on their previous experience with that technology. The more experience the students have, the more attention they can pay to the activity itself. Those who have not experienced the technology may need explicit instruction not only of the technology itself, but also positive effects or expected results. For example, supplementary devices, such as a program that enables students to see all the peer comments made on the original draft in one computer, may make peer feedback visible so that it increases the probability of incorporating the feedback into revision. Further studies are needed to investigate whether these types of additional assistance can make a difference in students' attitudes toward the use of technology in class and eventually increase their knowledge of class content.

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APPENDIX
PEER EDITING WORKSHEET 1

Peer Editor:_____ Date: _____

1. What do you like best about this paragraph/essay? In other words, what is this writer's best writing skill?

2. Do you understand everything? ☐ Yes ☐ No
Circle or underline anything that you do not understand, and write a comment about it.

3. Copy the main argument here, and underline the topic sentence of each paragraph.

4. What examples and details does the writer provide to support his/her argument?

5. Would you like more information about anything? ☐ Yes ☐ No
   If your answer is yes, write down what you would like to know more about.

6. What suggestions or changes would you make for a better argument essay?

THE IMPACT OF COGNITIVE STYLES ON DESIGN STUDENTS' SPATIAL KNOWLEDGE FROM VIRTUAL ENVIRONMENTS

Assist. Prof. Dr. Işıl YILDIRIM
isil.yildirim@izu.edu.tr
İzmir University

Assoc. Prof. Dr. Rengin ZENGEL
Dokuz Eylül University
rengin.zengel@deu.edu.tr

ABSTRACT
In parallel with the technological developments dominating usage of digital tools in science and education, caused the transform of knowledge in new ways. The reflection of these integration is seen in design discipline as its active role in this circle whether in practice or in the era of education, Benefit from the capabilities of new technologies in the education process for increasing design students' spatial knowledge, benefit from them digital tools also effect their carrier life in positive direction. By noticing the traditional education methods which are still using in many design school, the endeavor indicates that determine the appropriate learning method by considering individuals different cognitive style. The cognitive styles mean classify individuals according the way of perceive information and process it. Through this way, as subjects of the study, students categorized in respect to their cognitive styles whether field dependence or field independence, and then the relation between their cognitive style and spatial knowledge acquisition from virtual environment was observed. While defining digital tools in design education, the need of differences related to cognitive styles should be considered, this is supported by the data from this study which are indicating the increase of students' spatial knowledge in different scale of virtual environments.

Keywords: Cognitive style, design education, virtual environments, spatial knowledge.

1. INTRODUCTION
Computer usage which enables the creation of seemingly impossible design and design products has expanded horizons in architectural practices and education like in all other professions, computer programs which assist in line drawings has acquired more common usage area in every stage of design depending on new software and development of communication technologies. Designs are animated in virtual environment, thereby experienced, shared on platform which enables international exchange of ideas. With the validity of information which is obtained from digital media created by computer programs becoming data in the studies of real environment designs and formation of studies in this way; the issue of perceiving spatial knowledge has become more and more important (Çubukçu, 2005). In the study in which it is aimed to determine strategies suitable for the creation of studying environment in parallel with the innovation of information age, considering individual differences, individual perception differences and level of spatial knowledge design students acquired from virtual environments were presented depending on cognitive styles.

Terms of cognitive style or learning style have been frequently elaborated by education theorists in the last sixty years and it was seen that they have used different terminologies in their statements (e.g. Witkin et al, 1971; Goldstein and Blackman, 1978; Tennant, 1988; Biggs & Moore, 1993; Riding & Pearson, 1994). The term cognitive style which is the intersection of common approaches can be defined as individual's attitude towards organization, process and approach information and it was underlined that this is independent from the intelligence of individual (Messick, 1984). The way we pay attention to the information around us and the way we acquire it, the way the information is processed and stored by the brain, our approaches in problem solving are related with our cognitive thought (Solso, 2007). The effect of individual on performance may change in negative or positive direction depending on the kind of task; it is seen that specific styles can reach better results by adapting to specific tasks (Riding, 1996). For example, individuals who have field dependent (holistic) cognitive style may have difficulty in analyzing the new information by decomposing it; however they have higher ability of retaining general perspective. This style provides them skill in perceiving the general frame. Individuals who have field independent (analytical) cognition are prone to decompose new information and relate them with stored information. They have high tendency towards regarding in pieces rather than perceiving full-scale (Riding, 1997).

Although there are many tests used in the determination of cognitive styles, Witkin's Group Embedded Figures Test which aims to determine Field Dependence-Field Independence, in other words skill of Analytical thinking was preferred since it provides basis for the others and has higher validity values (Witkin, 1971). According to finding simple geometries hidden in a complex field; it is possible to define field independence or individuals who have analytical cognitive style and individuals who have dependence cognitive styles and cannot show the same performance in finding hidden geometries simply as defining these individuals as those who mark the trees when they look at a forest picture and those who simply see the forest itself (Parkinson, 2002).

Studies show that field independent individuals display better performance in computer assisted and internet interactive environments compared to those who are field dependent. In his study Post (1987) determined positive relation between field independency and success in computer assisted environments. Waugh (1993) mentioned that field independent individuals are better in text-based processes; however visual-graphical environments can be more efficient for field dependent individuals (Parkinson, 2002). In this study, inferences of field dependent and field independent individuals in a virtual environment which is composed of motion animations, fictions including more perceptual load (Strehler, 2008) compared to texts and stable visuals will be analyzed. In addition to this, it will be mentioned that information transfer from visual environments depending on cognitive styles provides what kind of data especially to those who receive design education and whose success is influenced by three-dimensional thinking skill and information obtained from the environment. Depending on the cognitive styles in learning, it was aimed to examine environmental data obtained from the digital media and utilization of digital tools as spatial information resource in accordance with design education.

2. METHOD
2.1. Sampling
The sampling of the study is composed of 36 prospective interior architects chosen with simple random sampling among third class students who receive education at İzmir University of Economics, Fine Arts Faculty, Department of Interior Architecture and Environmental Design (n=36). Students were entitled in the department according to their scores in Turkish-Mathematics fields in university examinations. 14 of the participants are male and 22 are female students. First of all the students were applied cognitive style test (Group Embedded Figures Test) and then a test composed of nine questions which was developed by researchers was applied to students in order to determine the level of knowledge they have acquired from virtual environments.

2.2. Assessment of Participants' Cognitive Styles
In the determination of cognitive styles of all participants, Witkin's Group Embedded Figures Test which is a standard tool whose validity and reliability study was done was used. Spearman-Brown test reliability of "Group Embedded Figures Test" developed by Witkin (1971) was found .82. "Group Embedded Figures Test" is composed of three sections with seven, nine and nine questions and there are 25 items in total. The students are expected to answer the test in two, five and five minutes respectively. The first section which is composed of seven questions is the stage of training and is not included in the evaluation; in the second and third sections which are composed of nine questions students were classified in the sense of field dependence and field independence according to the ability of finding hidden simple figures within complex figures. In other words, the number of simple figures they found reflects the level of individual's "field dependence".

2.3. Determination of the Knowledge Level Obtained from Virtual Environment

Interior architecture third class students were grouped according to their cognitive styles, their information obtained from virtual environment was defined, statistical analyses were done and relation/irrelation between these data and cognitive styles were determined. The field in which the spatial knowledge will be questioned in the study is four-dimensional animation movie which takes place in the interior and exterior spaces in different complexity levels (Figure 1). The animation which was produced by Triotech firm is composed of interior spaces and exterior spaces with different densities such as roads, streets which a student passes through on his way between house and school.

Participants first of all experienced four-dimensional animation movie which lasts four minutes. Different from computer screen, motion and wind effects were used from time to time during observation of virtual environment in order to perceive the sense of reality. Following the virtual environment students have experienced in groups of four people, students were expected to answer tests which measure their spatial knowledge level individually in order not to divert their attention away. After a couple of minutes' rest; students who have watched the animation perform a test which examines their knowledge of route, knowledge of map, distance estimations and sketches about environment.

2.4. Data Analysis

Data obtained from test applications of students will be analyzed by using Windows Excel program for accounting data; by using Windows SPSS program for statistical data. Data obtained from student statements and test applications will be analyzed and interpreted by using techniques such as Pearson, Chi-square and one-way variance analysis (ANOVA).

Figure 1. Interior and exterior space samples observed in the animation

3. FINDINGS

As it can be observed from the table below, of all 36 students – 22 female and 14 males- 13 of the students were evaluated as field-dependent and 23 were evaluated as field-independent (Table 1). As a result of the analysis of data, there was no relation between gender and field-dependence.

Table 1. Distribution of cognitive styles of participants

	FEMALE	MALE	Total
Field-dependent	7	6	13
Field-independent	15	8	23
Total	22	14	36

In order to measure the virtual environment knowledge of third class interior architecture students who are grouped according to their cognitive styles, a test which examines their knowledge about environment they have experienced was applied to them. Students were expected to draw the first and last space they have seen as sketches, and a result the relation between this drawing and cognitive style was analyzed. There was a positive relation between success of drawing sketches and field-independence compared to others ($p < 0.05$).

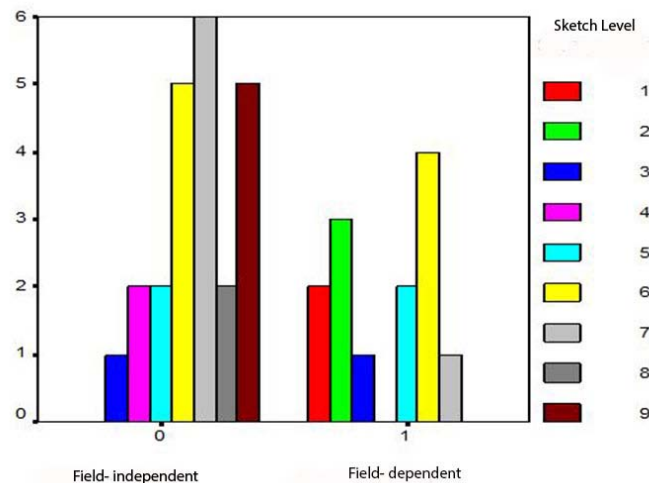Table 2. The relation between cognitive styles and success of drawing sketches

Table 3.The relation between cognitive styles and estimation of vertical distance
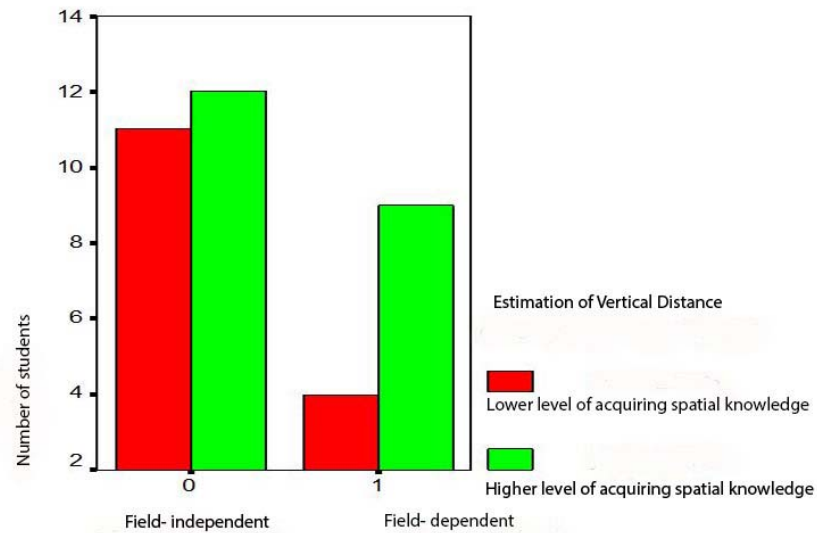
It was determined that students give similar answers to the questions about vertical distance or highness, therefore neither of the cognitive styles has superiority over other in the perception of vertical. When general success and cognitive styles are compared, it can be said that field-independent students have higher level of acquiring spatial knowledge. In addition to this, the level of spatial knowledge acquired by the whole cognitive styles can be qualified as positive. Therefore in this study it was seen that all the participants acquired meaningful spatial knowledge.

Table 4. The relation between cognitive styles and level of general success

Table 5. The relation between knowledge level of virtual environment (General Success) and the frequency of playing computer game

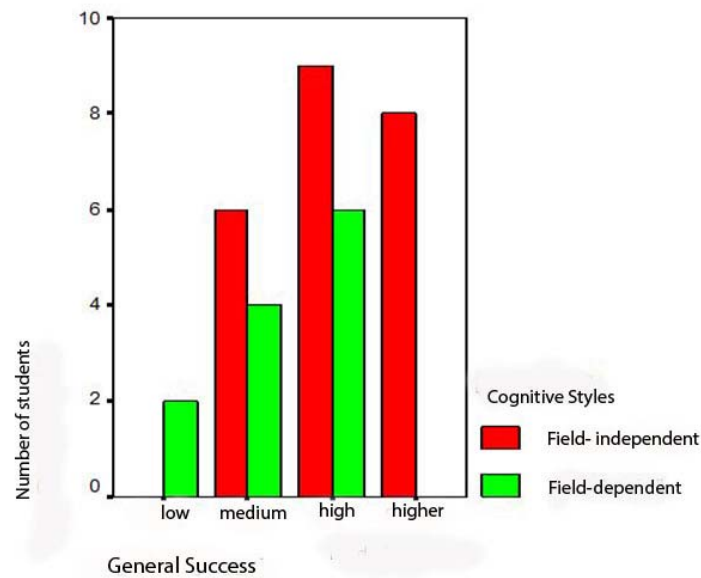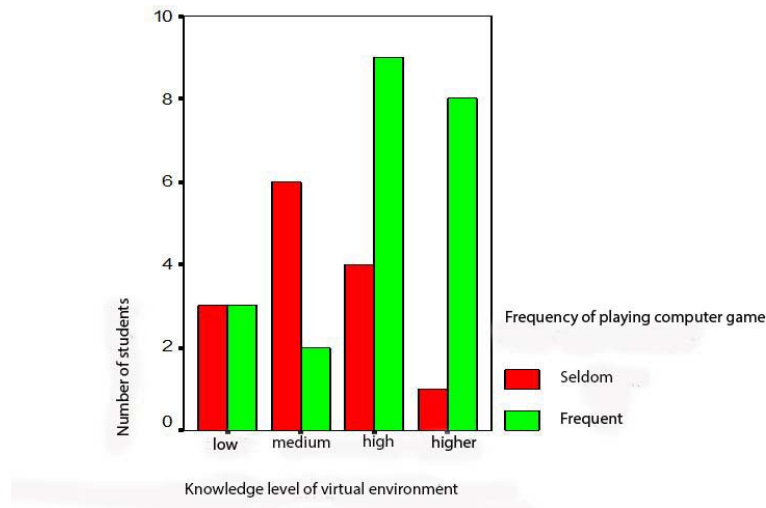In the scope of study many analyses were done in which cognitive styles are dependent variables. Sometimes these analyses indicate significant relations between specific variables and sometimes showed that these relations are independent from each other. Although there is no connection between cognitive styles and playing computer game, it was observed that students who play computer game are frequently more successful in acquiring knowledge from virtual environment (p<0.05). When frequency of playing computer games is being determined, students' answers were grouped and three in a week and more was accepted to be frequent, three in a week and less was accepted to be seldom.

4. RESULTS
In this study in which the level of knowledge of design students acquired from virtual environment is assessed; it is seen that individuals who are at the specific groups of cognitive styles acquired different knowledge from virtual environment compared to others. There was a meaningful relation between students' cognitive styles and success of acquiring knowledge (general success) from virtual environment. However there is a point here to be mentioned that virtual environment - including real-like effects – has positive influence to the increase of all students' level of spatial knowledge. Supporting the studies about the view that the attitude of design students towards computer usage is positive, it is thought that the significant relation between frequency of playing computer games and general success shall not be ignored.

The unexpected situation was about the fact that field-independent students are more prone to drawing and design in computer environment. Findings of this study support the studies which show that there is no relation between cognitive styles and computer usage (Pektaş, Erkip 2006). Drawings of field-independent students by referring to three-dimensional objects in describing the space reflect their tendency of thinking in pieces (Riding, 1997). In their studies; Goldstein and Blackman (1978), Macleod Jackson and Palmer (1988) have analyzed the relationship between cognitive styles and spatial skill and mentioned the relationship between field-independence scale and spatial skill. That the results of analyses of general success data are in this way proves that the study gives parallel results with these thoughts.

Due to individual differences which are emphasized by cognitive approach, personal needs, expectations, perception styles and learning preferences of each student are worth considering. The sense of education which aims to bring designers of digital age is expected to be fed with cultural essence and enriched in interaction with technological opportunities. It is estimated that the effect of cognitive styles deserve more praise in students' acquiring spatial knowledge from virtual environment and it would be beneficial in improving spatial knowledge acquisition in design education. This is because of the fact that individual differences influence techniques and methods used in the processes of acquiring and processing information and may cause difference in the expectations towards learning environment. In this sense, difference of user depending on the cognitive styles should be considered while defining Virtual Education Environments in design field.

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http://www.trio-tech.com/

THE NEARLY FORGOTTEN MALAY FOLKLORE: SHALL WE START WITH THE SOFTWARE?

Normaliza ABD RAHIM
Universiti Putra Malaysia, Malaysia
drnormaliza@gmail.com

ABSTRACT
The study focuses on the nearly forgotten Malay folklore in Malaysia. The objectives of the study were to identify and discuss the types of Malay folklore among primary school learners. The samples of the study were 100 male and female students at schools in Selangor. The samples were picked at random from several schools and they were given software to view which consisted of Malay folklore. The subjects were interviewed based on their opinions on the use of the software in disseminating the Malay folklore. The data were analysed by using the discourse analysis method by Brown & Yule (1983). The results revealed that the software has given the awareness of the forgotten Malay folklore and further, it has given the overview of most types of stories in Malay folklore. The subjects seemed to favor most of the stories and state that the technology has given them the opportunity to appreciate the forgotten Malay folklore. The study implicates school students, teachers and researchers in understanding, appreciating, disseminating and identifying the moral values from the Malay folklore.

Keywords: Malay folklore, software, primary school learners, disseminating

INTRODUCTION
Malay folklore consists of folk music and song, bardic tales, animal fables, ghost stories, epics, fairy tales, symbolic lore and myths. Each of the stories have its strengths in terms of characters, setting and storylines. The Malay folklore has started long time ago. It was based on the Malay culture and also the influence from the environment according to the timeline at the moment the stories were written (Othman Puteh, 1984; Md Sidin Ishak, 2005; Hadijah Hamat, 2006). Some of the stories were storytold and disseminated from mouth to mouth, since at that time, the stories were not written or documented. Moreover, the stories were brought down from generation to generation for the purpose of preserving the values in the stories (Mohd Taib Osman, 1988; Normaliza Abd Rahim & Siti Nur Aliaa, 2012) . Other than that, the Malay folklore were created for the purpose of pleasure, satisfaction, teaching and learning, history, for naming a place, etc. The stories have their own meaning and purposes of its existence (Roslina Abu Bakar, 2013). Thus, the Malay folklore have been the liking and favorites among the villages since at that time, there were no technology existed. Although the stories were storytold and changed from time to time, but the basic or purpose of the stories were similar and thus, the moral values of positive values were well explained and understood.

Folklore Throughout the World
Davis (2010) states that Ben Botkin (1938) defines folklore as one traditional creation in one community and was carried down as their culture from one generation to another. It is an identity of the community. The folklore is the Malay literature that will be of good use for the community. Malay foklores consist of various version that were adapted and adopted according to the storylines. According to Mohd Taib Osman (1988) in Malay folklore, the stories were based on the culture and were preserved till date. The stories were not documented properly but were disseminated from mouths to mouths from generation to another. Thus, the content and storyline were the same as the original. Bronner (2012), Miller (2013) and Roslina Abu Bakar (2013) add that the stories in folklore should be taken care of in order to preserve the originality of the stories. Bronner (2012) also focuses on the theories and research on folklore which give benefit to students, teachers, lecturers, authors, and publishers. The researchs have helped to give overview on the findings of using folklore in everyday lives. Thus, Miller (2013) concentrates on the perception of the society towards folklore. The folklore has somehow gives great impact towards the growth of the younger generation in understanding the good values of their ancestors. Hence, the good values were well mantained and practised for the harmony of living.

On the other hand, research on folklore were also done in China. Grayson (2013) concentrates on the anthology of Chinese folk and popular literature. The samples of materials of folktales, folk songs, folk rituals, epic tradition, folk drama which include puppet theatre, and folk storytelling traditions. The subjects were vast and most of the material have never been translated in English. Thus, the folklore were well kept and preserved in such a way, researchers were able to use the folklore in disseminating to the society. Grayson (2013) adds that

the area of folk literature and a valuable resource for all researchers working in the area of folk literature in China and also valuable resource for all resaerches in the subject area. Watkins (2004) agrees with Grayson (2013) and postulates that in Great Britain, folklore and popular religion during the middle age were well disseminated to the community. This way, the folklore were learnt and understood by all ages. Other than that, the folklore were well appreciated and storytold from generation to generation. Hence, Miller (2013) adds that, everyone plays a major role in giving awareness on folklore to the younger generation and to ensure that the folklore were still remembered. This way, the folklore will be preserved in terms of content and storylines.

Malay Folklore and Technology
Nowadays, in order to disseminate the folklore to the community, research were done by using various types of technology. Normaliza Abd Rahim & Siti Nur Aliaa Roslan (2012a) state that special needs children were able to storytell the stories repeatedly. With the help of digital stories prepared by the researcher, the subjects involved were given more time on the computer in order for them to read and try out the program. The stories involved were based on the Malay folklore. The folklore were about animal folklore which have a few animals that they knew. The graphics of the animals were the main attraction for the subjects to continue with the activity using the computer. Thus, Normaliza Abd Rahim (2011a; 2011b) claim that other types of Malay folklore were also the favourite among special needs children. For example, animal folklore, myths, music and song, etc. In this study, Normaliza Abd Rahim (2011a; 2011b) state that the subjects involved were children with Asperger syndrom. They were given Malay stories in the computer. Surprisingly, the subjects were able to concentrate on the story while trying out the program from the computer. Besides that, there were also other technologies used in the classroom. The use of audio from the CD which consists of songs of the story and also from the computer with many graphics.

Normaliza Abd Rahim & Siti Nur Aliaa Roslan (2012b) state that primary school students were happy and content when using the computer to learn about verbs. The stories were taken from the Malay folklore and translated to the English language. The subjects seemed to be happy with the stories since it was different from other stories. It can be seen that the subjects were able to identify the verbs in the stories and the program in the computer has given them the motivation and increase their interest in learning. Siti Musliha Isnain & Normaliza Abd Rahim (2012) proclaim that the use of computer has helped the students in discussion topics that were given to them. The computer programs which consisted of Malay folklore (animal folklore) have given them the opportunity and chance in discussing their ideas and comments towards the stories. The stories have made them want to know more about the characters, setting and storylines. The subjects were seen happy and content after the viewing and they were able to give good feedback pertaining to the program. It can be seen that the program has helped them in understanding and recognizing the Malay folklore which were nearly forgotten. They also mentioned that the animals stories that were in the program were storytold by their grandparents and they were happy to share their comments and opinions with their peers. Normaliza Abd Rahim & Siti Nur Aliaa Roslan (2012c) have the same results as the study by Siti Musliha Isnain & Normaliza Abd Rahim (2012) where the subjects were very keen in discussion. Although the study by Normaliza Abd Rahim & Siti Nur Aliaa Roslan (2012c) focussed on subjects from Ireland but they were exposed with the Malay folklore among their Malaysian friends. This can be said that the influence of folklore has given them the courage to speak out and discuss in enthusiasm.

PROBLEM STATEMENT
Othman Puteh (1989: 41) stated that it has been 35 years that the Malay folklore existed. Thus, Malaysia does not have a credible author or writer as a model for the folklore. Hence, there are authors and writers now who are active, productive and profilic but are still in the process or cannot be evaluated as a Malay folklore model. Now, after 55 years of the Malay children and youth literature, there are still problems in identifying the credibility of the authors or writers. To add, Othman Puteh (1984; 1998) claim that Malay stories for children and youth focus on Malay folklore were replaced with new stories and environment which reflect the moment that the stories been published. Thus, the Malay folklores were pushed aside to put in the new stories in the market. Next, according to Nik Rafidah Nik Muhammad Affendi, Normaliza Abd Rahim, Arbaie Sujud & Nurul Azimah Abdull Sedik (2013), the concept of Malay children and youth literature is still loose and not complete. Therefore, the Malay folklore has been forgotten and ignored.

Based on the literature review above, it can be seen that folklore are still needed for each community. Basically, different community with different folklore. The dissemination of the folklore can either be done from words of mouth but also through any different form of technology. As for the Malay folklore and in line with the new era of technology, the computer plays an important role in the dissemination of the Malay folklore. Therefore, the objectives of the study were to identify and discuss the types of Malay folklore among primary school learners.

METHODOLOGY

The samples of the study consist of 100 subjects from primary schools in Selangor, Malaysia. The subjects were picked at random aged between 9-10 years old. The subjects were divided into four groups and they were given a program of Malay folklore to view. The program consists of stories from folk music and song, bardic tales, animal fables, ghost stories, epics, fairy tales, symbolic lore and myths. After viewing, the subjects were given a set of questionnaires and they were also interviewed in accordance to the questions. The interviews were based on the views and opinions of the Malay folklore that they viewed and other folklore that they knew. The questionnaires were collected and data were analysed by using percentage. The transcripts from the interview were analyzed by using the discourse analysis by Brown & Yule (1983).

Brown & Yule (1983) state that discourse analysis is how humans use language to communicate and, in particular, how addressers construct linguistic messages for addressees and how addressees work on linguistic messages in order to interpret them. Most importantly, is the traditional concern of the descriptive linguist, to give an account of how forms of language are used in communication. The communication or utterances are considered as spoken activity and will be analysed as spoken discourse analysis. It is a study of conversation, dialogues and spoken monologues. Here, the communication or utterances took place when the subjects were asked about the views and opinions of the Malay folklore software. The utterances were transcribed and interpret for the purpose of the study.

RESULTS AND DISCUSSION

Folk Music & Song

Majority (100%) of the subjects preferred folk music and song. This might due to the fact that the subjects were exposed to the songs when they were young. Their parents sang the song for their siblings or for them. The songs were either for lullaby or for calming the subjects at home. The subjects stated that the songs have given them the courage to sing in public since most of the songs were well known by the rest of the children. 100% of the subjects stated that the music and songs were fun and they were able to show gestures by following the characters or verbs from the lyrics of the songs. Furthermore, the music was suitable for the subjects with piano and guitar accompliments. The subjects also mentioned that the music and songs were well suited for all ages and the lyrics of the songs have given them the idea of the whole story being delivered. They were happy to sing repeatedly either at schools or at home. Thus, at present, the subjects stated that the songs were not sang as often at schools anymore since they hardly hear the song in the classroom. This was uttered by the subjects in correspond to the questions on their opinion about learning Malay folklore through songs. The subjects suggested that the songs should be sung in the Malay language classroom and it does not matter if it will be done repeatedly every week. This will enhance their learning on Malay folklore through music and song.

Bardic Tales

Bardic tales have also been the likes of the subjects. The subjects were seen enthusiastic when asked about this folklore. Majority of the subjects (98%) agreed that bardic tales have given them the visual of the real lives of the characters. The tales have also given them the opportunity in understanding the storyline and the messages were also been delivered. Moreover, the bardic tales have shown great stories that resemble happiness and joyful among the community in the story. The subjects also commented that bardic tales have moral values that were well understood by them. The moral values were stated in between the lines and thus it have given the subjects the chance to use the values in their everyday lives. The moral values like respect, love, care, helping each other and others were in the stories. On the other hand, the characters in the bardic tales were sometimes funny and this has lead the subjects laugh and giggle while reading the stories. The enjoyment that they had, had given them the influence of good attitude; love towards reading, understanding the character and the message that the characters wanted to say. The influence not only stops at the students but also among their peers outside the classroom. Also, the influences from the good attitude were spread among the family members at home. The subjects uttered that they storytold the bardic tales that they knew from school to their family members at home. This has lead to the awareness of the tales among the family members.

Animal Fables

The animal fables were also being the favorites among the subjects. The subjects were happy to tell stories on animals that they knew. Most of the stories were famous in storybooks. The subjects (100%) agreed that the animal fables have given them the thrill, fun and satisfaction in reading. The subjects stated that the animals involved were domestic and dangerous animals such as the tiger, lion, cheetah, snakes and so on. The domestic animals were always the rabbit, cat, mouse etc, and most importantly the domestic animals were cute and friendly. All the female subjects preferred cute animals with round eyes and furry like the cat and rabbit while the boys preferred dangerous animals like the lion and tiger. Other than that, the subjects also mentioned animals that live in the jungle such as the elephant, giraffe, rhinocerous, zebra, horse etc. The subjects stated that the

animals were best included in the animal fables so that all students at schools were able to recognise the animals' features. This will enhance their learning ability that relates to science and geography. Subsequently, the subjects uttered that the animal fables consisted of moral values for humans. The moral values were stated in the stories such as love, care, respect, helping each other, sincere, generous etc. Thus, the moral values have given the subjects a great impact in their everyday lives. The subjects were happy to follow the good characters in the fables and they sometimes mentioned the characters from the books to their peers and family members.

Ghost Stories
Equal number of subjects like and dislike the ghost stories in the Malay folklore. 50% of the subjects were too scared to read the stories while the other 50% seemed to say that the ghost stories were not that scary. Most of the subjects that like the ghost stories were male and they said that the ghost stories were more fun than the rest of the Malay folklore. The subjects confirmed that the ghost stories were not real and the stories were just for enjoyment purposes. The subjects stated that most of the ghost stories were written long time ago where the people who live in the village were not exposed to television and any other technologies. So therefore, the villages created ghost stories for fun. Other than that, the ghost stories were created in order to scare their small children from going out at nights or play at dangerous places. This way, the stories will ensure that the children were scared based on the stories that they heard. Although, some of the ghost stories have no moral values but most of the stories have given great impact towards the children in visualizing bad things might happen at weird places. This way, children will stay home with their parents or go out with an adult supervision. This has led to a positive lives and meaningful day for them. To add, the subjects also uttered that the ghost stories have made them realize that good attitude will have positive outcome and endings. This way, the subjects will ensure that the ghost stories will be read to their future generations in a good way.

Epics
Majority of the subjects (60%) agreed that epics were their favorites. This might due to the fact that epics were difficult to understand. Furthermore, the subjects stated that the epics consisted of stories of the King of a country or about a strong person who lives long time ago. Apparently, majority of the subjects guessed or assumed that the stories consisted of interesting stories that were related with their lives. The female subjects were dreaming of being the queen or princess of the country or even falling in love with a handsome prince. The subjects were thrilled when they were asked about the stories that they have seen and read. They stated that the stories consisted of meaningful events and all the events were related to the main character. Usually in epics, the main characters were male and therefore, the female subjects like it so much. Thus, the male subjects like the strong characters that fight and always win. Subsequently, the subjects who disagreed (40%) on the epics were not happy with the stories other than not able to understand but they also hate being in a kingdom that does not resemble the real life. They seemed to have much difficulty in understanding the moral values in the stories. The subjects also mentioned that epics have failed in giving them the adventure or interest in reading. Also, epics have too much storyline in a story and therefore would lead to confusion. They uttered that the stories have difficult names to pronounce and also the name of the kingdom that did not exist.

Fairy Tales
Majority of the subjects (80%) agreed that they liked fairy tales. All 60 subjects were female while the other 20 subjects were male. The female subjects stated that fairy tales were fun and interesting. They also stated that the character in the fairy tales were handsome and beautiful. The male subjects like the idea of the story although they were more towards strong characters in the story rather than being good looking. The male subjects were happy and satisfied with the storyline from fairy tales although they knew that the stories were not real. All the subjects (80%) mentioned that the settings of the stories were interesting and they were able to visualize it although they knew that it does not exist now. As a matter of fact, the subjects did not compare with the setting now but to accept the setting in the fairy tales. Other than that, the subjects said that the storyline were interesting and different from one story to the other. They were no similar storyline. The stories consisted of moral values which made the subjects understand the messages in it. The subjects were content and happy with the underlying message and mostly about care, love, respect, understanding and others. This way, the subjects were able to use the moral values that they have learnt into their everyday lives with their peers and family members. Minority of the subjects (20%) disliked the fairy tales. When asked, the subjects stated that the fairy tales were stories for the female and they said that love stories were not suitable for them. Surprisingly, all the male subjects (20%) agreed with the idea of being strong and adventurous would be a good character in a story. Therefore, fairy tales will not show these characters. Thus, the subjects agreed that one day, they might like the fairy tales and will be able to accept the characters in the stories. Also, they agreed that in fairy tales should include moral values so that it will bring strong influence towards students at schools.

Symbolic Lore

Majority of the subjects (70%) stated that they liked stories on symbolic lore. The subjects stated that the symbolic lore stories were interesting and easy to understand. Thus, there were moral values in the stories. The moral values were related with their lives. The subjects add that the symbolic lore were able to give them the chance to understand the Malay culture and language. The Malay culture and language were well preserved. As a matter of fact, the subjects were able to give examples of Malay culture that were related to the stories. For example, the culture of bowing down when a person wants to walk in front of an older person. This action was seldom practised among the youngster. When asked, the subjects agreed with the actions and they agreed to follow the culture at home. A few of the subjects stated that they have already practiced most of the Malay culture at home since their parents have taught them to do so. Hence, they agreed that symbolic lore has given them positive impact in their lives. Apparently, minority of the subjects (30%) mentioned that the stories were difficult to understand. This might due to the fact that the stories were in the form of symbolic lore and they have a hard time in understanding and relate the stories. They were also confused with the integration of Malay culture in the stories. Some of the subjects might feel that it was a new culture or they have not practiced it anymore. This was disappointing since the subjects have forgotten the culture and thus, the symbolic lore would be a tool in helping them. Another reason would be because the subjects were from different races and culture and therefore, the culture from a race might be different from another and vice-versa.

Myths

When asked about myths, the subjects seemed to be excited. Majority of the subjects (96%) were fascinated with the stories related to myths. For them, the stories would make them imagine and visualize the characters in the stories. According to the subjects, with the use of technology, they were able to enjoy the stories more when they were given opportunities to experience the whole story in their mind. They also stated that myths were able to give them the chance to be creative and innovative. They were able to create new stories and the stories were favored by other students in the classroom. The characters were created based on the stories that they heard and read. Other than that, the subjects said that the characters were either human or animals. They preferred to have both characters in the stories. They also preferred animals that were created based on their likings. For example, the animal that looked like a dragon but with wings and long tail. The dragon was strong and nice. Although, the story was based on myths but it has moral values. The moral values like, love, share, respect, helpful, understanding, etc, were stated in the stories. Therefore, it can be said that myths stories were able to give positive impact to the subjects. The subjects stated that the positive impacts were able to expose the other students at schools in showing and giving good deeds towards others.

To sum up, with the use of Malay folklore software in the classroom, majority of the subjects were able to recap the stories that were nearly forgotten. The subjects seemed to be happy with the software and they enjoyed watching all the stories. The subjects were determined to give their opinions and views based on all the stories from the software. It can be said that the show of enthusiasm from the subjects during the study has shown that they were interested in the Malay folklore. They uttered that the Malay folklore were seldom discussed in the Malay language classroom. If so, the subjects suggested that the software should be disseminated to all students in Malaysia. This way, the Malay folklore will be preserved and talked among school children and even in Malay sketch, drama and movie. The results of this study were similar to the finding of the study by Othman Puteh (1984), Roslina Abu Bakar (2013) and Nik Rafidah Nik Muhammad Affendi et al., (2013) where Malay folklore should be preserved and disseminated for the next generation. The needs of the Malay folklore among the new generation will be able to reflect the lives of their ancestors. The results of the study was also similar to the study by Nurul Azimah Abdull Sedik et al., (2013) where Malay folklore should consist of interesting graphics that will be able to attract the attention of the readers. Thus, technology has played an important role in creating the graphics for the Malay folklore.

CONCLUSION

This study implicates children, teachers, lecturers, book authors, publisher, ministry of education and researchers towards the Malay folklore. It can be said that the nearly forgotten Malay folklore will be best incorporated in the Malay language classroom. This way, school children will have the awareness of the stories been existed from long time ago. To add, with the use of technology via Malay folklore software, the stories will be disseminated to everyone at all ages. It is hoped that future study will focus on the use of other means of technology in disseminating the Malay folklore.

ACKNOWLEDGEMENT

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THE RELATIONSHIP BETWEEN THE EMBEDDED INSTRUCTION APPROACH AND MODERN CITIZENSHIP COMPETENCY

Chen-Fong Wu
Department of Business Administration, College of Management, Providence University, Taiwan
cfwu@pu.eud.tw

ABSTRACT
Since 2011, universities in Taiwan have being pursuing a new direction in education — embedding citizenship in professional courses to help students achieve professional competencies and modern citizenship competency. By applying both quantitative research and case analysis, the study presents 2 conclusions. First, student ethical literacy reached the highest level and aesthetic literacy reached the lowest among the learning outcomes of the 5 civic literacies by applying the embedded instruction approach. Second, the 8 embedded teaching methods significantly influenced the student recognition level of citizenship; among these methods, *performance/exhibition* and *disputation* had the greatest efficiency. The course case analysis of this study also demonstrated that a practice-oriented teaching strategy, such as encouraging students to undertake learning projects and public exhibitions, is considerably effective in promoting citizenship.

Keywords: general education, citizenship, embedded, professional courses

INTRODUCTION
The Ministry of Education (MOE) in Taiwan has formally implemented the Cultivating Citizenship Program in universities since August 2011. By considering each school as a unit, the program attempted to facilitate the development of modern citizenship by creating a sound learning environment and reforming the instruction approach of the entire school. The program emphasizes cultivating citizenship through five civic literacies, including the literacies of ethics, democracy, science, aesthetics, and media. The program is expected to enable undergraduate students to develop modern citizenship competency besides engaging in professional knowledge and help them obtain a global view and zeal for participation in social affairs. Since the initiation of the Cultivating Citizenship Program in 2011, a total of 46 universities have applied for grants by the MOE, but only nine universities with remarkable programs passed the evaluation and received the subsidy. University P, the sample in this study, is one of the three subsidized universities among dozens of universities in central Taiwan (Ministry of Education Advisory Office, 2012). The purpose of this study was to analyze the characteristics of the learning outcomes of University P's students after the end of the first program term (i.e., from August 1, 2011 to December 31, 2012).

The Taiwan MOE empowered the nine subsidized universities by granting them greater autonomy to implement the Cultivating Citizenship Program regarding aspects such as course design, instruction approach, and assessment of learning outcomes depending on the characteristics of the university. The MOE also held midterm and endterm outcome workshops so that universities could learn how to implement and improve citizenship. The MOE could also evaluate the program outcomes of the nine subsidized universities as a basis for deciding whether to continue subsidizing them for the following term [i.e., the MOE granted NTD$6 million and the university matched 30% of the grant for a total of NTD$8 million (approximately USD$0.27 million) subsidy per term]. The subsidization indicates an honor as well as a performance index for the school; thus, universities in Taiwan actively compete for the subsidy regardless of its small amount. University P received the second-term subsidy granted by the MOE in January 2013 for good implementation outcomes of the program during the first term.

University P was the only sample in this study. However, it is possible to yield dependable reliability and validity study results by applying two methods and comparing them: the Analysis of Moment Structures (AMOS, a quantitative research method), used for analyzing the relationship between student learning outcomes and teaching methods, and the case analysis method, for studying the characteristics of the teaching methods. An instructional framework of citizenship in disputation and practice was also developed using the study. The framework indicates that, to cultivate citizenship, the mold of the traditional class lecture in which students play the role of the one-way audience must be broken; instead, the class learning space should be in the "real" environment outside the classroom, where students personally participate in activities such as cultural and creative activities such as art exhibitions. Meanwhile, financial support and proper lecture training for instructors from the school, as well as social and industrial resources applicable for student use, are effective instructional

strategies to promote citizenship embedded in professional courses.

THEORETICAL BACKGROUND

Humanism Lost in University Education

Wooing excellence, performance, and good evaluation indicators favored by universities has recently replaced the discourse about ideals in university education, and humanism is rapidly being eroded. Universities have become less rich in ideals as pillars of an academic hall in holistic education and have ironically become a "company" bidding for excellence (Tsou, 2012). In other words, the traditional ideals and values in universities have diminished, and the humanistic spirit and literacy have been forgotten. Such "lost humanism" has averted people from social participation or reflection and practice of social issues in real life.

University education faces severe criticisms. For example, both Snow (1965) and Leavis (1962) indicated that the British education was restricted to the extent that liberal arts do not interact with science. Snow encouraged students majoring in liberal arts to take more science elective courses, and vice versa. Leavis called for a focus on the humanistic spirit as the core of university education. Because global capitalism has "controlled" universities and made them prejudiced in favor of quick success and instant benefits, education has virtually become a commodity. In a capitalistic society, the notion that "greed is good" becomes logic, and the humanistic spirit and citizenship evaporate (Lu, 2012).

The Renaissance of Citizenship

Revisiting true university values is a way to overcome the problem of lost humanism. Academia in Taiwan has discussed the concept of citizenship, and reaffirmed the importance for university education to cultivate citizenship in general education.

Many scholars in Taiwan (Chen, 2012a; Chen, 2012b; Tsai, 2012) identified with the Cultivating Citizenship Program implemented by the Taiwan MOE. They believed that the program should be rooted in five major literacies — ethics, democracy, science, aesthetics, and media. The fusion of general education and professional education helps develop students that have modern citizen core competencies that allow them to explore public issues and solve problems. Therefore, the MOE launched the first term of the Cultivating Citizenship Program by financially aiding nine focal universities in August 2011. This is an innovative movement in university general education and a major development for a renaissance of citizenship.

Relationship between Instruction Approach and Citizenship

Embedding citizenship in professional courses is an approach that integrates general and professional courses and avoids excessive focus on professional rather than general courses at present. Instilling the element of citizenship in professional courses activates their contents and promotes student learning interest; therefore, the instructional approach plays a critical role in facilitating the Cultivating Citizenship Program (Chen, 2012b).

After analyzing the current state of citizenship education in universities in Taiwan, Chen (2012a) and Hung (2012) considered that few teachers could successfully apply citizenship to instructional approaches, and that quantifying citizenship seemed difficult. Therefore, they suggested that teachers consider cultivating citizenship in a "holistic" manner. This can be accomplished by departing from the one-directional classroom lecture and focusing on topics such as ethical practice for decision-making in a predicament (Tsai, 2012). The holistic method for cultivating citizenship also considers literacy as knowledge and competence in external hidden curriculums, such as sharing experience in practical training or imparting knowledge in interactions (Liu, 2012). In conclusion, these "know-hows" (Chu, 2012) of applying citizenship to instructional approaches are developed by learning to solve problems occurring in daily life and in society.

The embedded instruction approach is conducted by including topics of concern in teaching activities of different subjects. It arises from the concept of constructivism, in which learners actively construct their own knowledge from life circumstances (Ning, 1993). Instructors initiate students in topics of instruction and motivate them to actively explore and construct knowledge based on their own experiences, by which past learning experiences can connect with new concepts in reflection. These activities cultivate students' new experiences. Finally, students obtain knowledge competence (Moursund, 1999; Post, Ellis, Humphreys, & Buggey, 1997; Thomas, 2000). In brief, the steps in the process of embedded instruction are (a) topic, (b) discussion, (c) reflection, and (d) practice. These steps yield knowledge and competencies (Chen, 2011; Tsai & Wu, 2004). The process resembles the aforementioned know-hows as the core of holistic cultivation of citizenship.

This study examined eight embedded teaching methods from methods commonly used in higher education. These include the traditional *pre-reading* and *out-of-school visits* methods, as well as the recently developed

methods compatible with the "discussion-reflection-practice" concept (i.e., *media-assisted materials*, *case analysis*, *film analysis*, *group learning*, *disputation*, and *performance/exhibition*).

Two constructs were developed: the citizenship-embedded instruction approach and the manner by which the instructional approach influences the level of student recognition of citizenship (ethics, democracy, science, aesthetics, and media). The learning outcomes students obtained from the teaching methods defined the recognition level construct. Therefore, a hypothesis is proposed as follows: the embedded instruction approach positively influences the level of student recognition of citizenship. Figure 1 shows the tentative framework developed in the study.
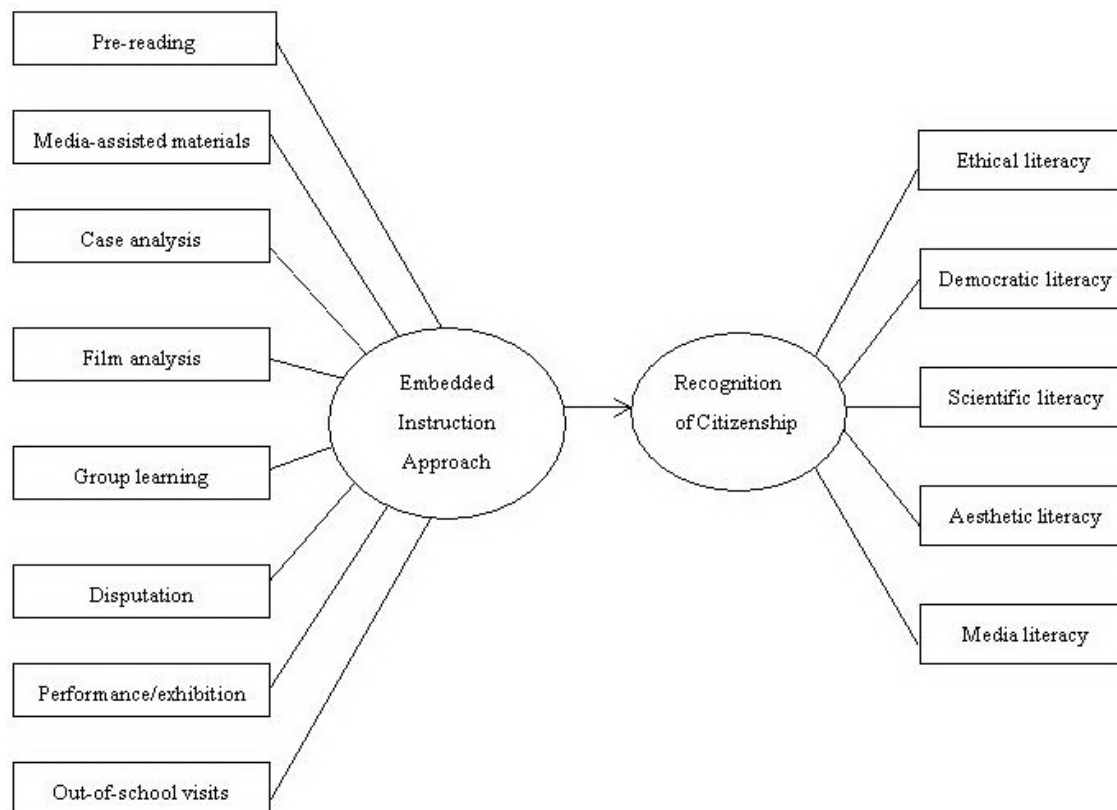
Figure 1: A tentative framework of citizenship-embedded instruction approach

METHODOLOGY AND ANALYSIS
The methodology in this study included two major parts. The first part was quantitative research. Using 800 questionnaires, we tested the level of the student recognition of citizenship through various teaching methods and verified whether the tentative framework in Figure 1 was sustainable. The second part was a qualitative course case analysis, which demonstrated contextual factors related to the constructs in the research framework by characterizing the teaching methods of four professional courses and students' leading learning outcomes. The comparison and cross-verification of the dual research method may prove the credibility and practicability of the instructional approach whereby citizenship is embedded in the professional course.

Quantitative Research
The independent variables in this quantitative research are the eight teaching methods, including the traditional method and the multiple methods employed by participating classroom teachers in their embedded instruction. The dependent variables are the recognition level of the five civic literacies suggested by the Taiwan MOE, including ethical, democratic, scientific, aesthetic, and media literacies. Each literacy included five items for a total of 25 items designed by the researcher and revised and pretested by experts, with good reliability and validity.

The operational definitions of the five civic literacies (i.e., the dependent variables) are as follows (Ministry of Education Advisory Office, 2012):

- *ethical literacy* is the ability of a citizen to use moral reasoning and rational judgment while facing ethical issues in daily life.
- *democratic literacy* is the ability of a citizen to respect facts and communicate rationally.
- *scientific literacy* is the ability of a citizen to comprehend the results yielded by science and to participate willingly in the discussion of public issues related to science.
- *media literacy* is the ability of a citizen to critically appraise and contemplate media information, and then properly use media to express concern about public affairs.
- *aesthetic literacy* is the awareness and practice of a citizen to perceive aesthetics and the ability to experience and build an aesthetic society in the world.

Regarding the sample, University P was selected because it was one of the nine universities obtaining grants from the Taiwan MOE to implement the Cultivating Citizenship Program. In addition, the MOE allowed University P to implement the second-term program and to receive continued subsidies in January 2013 because of its outstanding implementation after the first term (i.e., 1.5 years) of the program. Therefore, University P is a representative school in Taiwan that is able to advance citizenship, and its implementation outcomes may be used as a reference for other universities.

University P applied the embedded instruction approach in the first term of the program by using embedded citizenship in 37 professional courses with 1,100 enrolled students. The questionnaire was administered to these students after the end of the first term, and 800 valid responses were received for a return rate of 72.7%. The analysis of these responses is as follows.

Questionnaire measures: Factor analysis and reliability test. Table 1 shows the Cronbach's α of each measurement item. These values ranged between 0.754 and 0.923, which indicated a good standard of reliability (Wu, 2009).

Table 1: Factor analysis and reliability test

	Questionnaire item	Eigenvalue	Interpreted variance (%)	Factor loading	Cronbach's Alpha
	Ethical literacy	**3.576**	**71.52%**		**0.900**
	The course motivated you in personal and social responsibility.			0.884	
	The course developed your social morals.			0.869	
	The course encouraged you to devote what you learned to the society.			0.844	
	The course promoted your recognition on service value and altruistic motivation.			0.816	
	The course encouraged you to probe into issues through rational thinking.			0.814	
	Democratic literacy	**3.296**	**65.92%**		**0.870**
	The course helped you learn how to interact and communicate with others.			0.878	
	The course helped you expand interpersonal relationships.			0.857	
	The course fostered your habit to respect for other opinions.			0.797	
	The course helped you understand your role in the society.			0.764	
	The course helped you understand proper gender interaction.			0.757	
(Dependent variable) Recognition level of citizenship	**Scientific literacy**	**3.424**	**68.48%**		**0.884**
	The course fostered your ability to use information technology as learning assistance.			0.873	
	The course fostered your ability to search for information and resources.			0.858	
	The course encouraged you to achieve learning outcomes by information technology.			0.856	
	The course trained you to think logically through scientific ways.			0.797	
	The course helped you to apply theoretical knowledge to real-life problem solving.			0.747	
	Aesthetic literacy	**3.393**	**67.85%**		**0.877**
	The course fostered your ways to appreciate music and art.			0.909	
	The course fostered your interest in various cultural and artistic activities.			0.890	
	The course promoted your ability to appreciate music and art.			0.888	
	The course encouraged you to develop your personal creativity and traits.			0.749	
	The course fostered your enthusiasm for the environment of your school and residence.			0.650	
	Media literacy	**3.820**	**76.41%**		**0.923**
	The course developed your ability for rational use of different media.			0.892	
	The course developed your ability to avoid misleading media information.			0.878	
	The course encouraged you to analyze media information and its true nature.			0.876	
	The course fostered your respect for and attitude toward the media.			0.874	

	The course encouraged your critical thinking on different media.			0.851
	Teaching method	**3.433**	**34.33%**	**0.754**
(Independent variable) Instructors' teaching method	Performance/exhibition			0.770
	Group learning			0.746
	Disputation			0.645
	Case analysis			0.637
	Film analysis			0.623
	Out-of-school visits			0.598
	Media-assisted materials			0.489
	Pre-reading			0.631

Ranking of the recognition level of the five civic literacies. Table 2 shows the recognition level of the five literacies. According to the means of these levels, the participants exhibited the highest recognition level in ethical literacy and the lowest recognition level in aesthetic literacy.

Table 2: Means of the student recognition level on the five civic literacies embedded in professional courses

Civic Literacies	Mean	Note
Ethical literacy	4.06	Besides *aesthetic literacy*, the recognition levels of the other four literacies were similar.
Democratic literacy	3.92	
Scientific literacy	3.95	
Aesthetic literacy	3.57	
Media literacy	3.95	

SEM and path analysis of the model. For structural equation modeling (SEM) and path testing, the study used the AMOS statistical software to draw an SEM-related model path diagram for structural model analysis and to test the theoretical model in this study and the goodness-of-fit of observed data.

In the study, eight criteria were used to evaluate the overall model fit, including the chi-square degree of freedom (DF), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), root mean square residual (RMR), root mean square error of approximation (RMSEA), normed fit index (NFI), incremental fit index (IFI), and comparative fix index (CFI). The results of the overall model fit evaluation and collation (Table 3) show that most index values reached the verifying criteria, indicating good fitness of the model (i.e., the theoretical model was compatible with the data observed).

Table 3: The overall model fit in this study

Evaluation criteria	Analysis outcome	Recommended value	Evaluation result (goodness of fit)	Reference
Chi-square ratio	Minimum chi-square (Cmin) = 381.54 DF=83 Chi-square ratio=4.597	5	Match	Wu (2009)
GFI	0.942	0.9	Match	Hair, Black, Babin, Anderson, & Tatham (2006)
AGFI	0.916	0.9	Match	Hair et al. (2006)
CFI	0.933	0.9	Match	Hair et al. (2006)
RMR	0.043	0.05	Match	Hair et al. (2006)
RMSEA	0.067	0.08	Match	Browne & Cudeck (1993)
NFI	0.916	0.9	Match	Hair et al. (2006)
IFI	0.933	0.9	Match	Hair et al. (2006)

For path analysis, the study applied the method of maximum likelihood to conduct outcome estimation and analysis of related paths and to test the proposed tentative research framework. Figure 2 shows the study results.
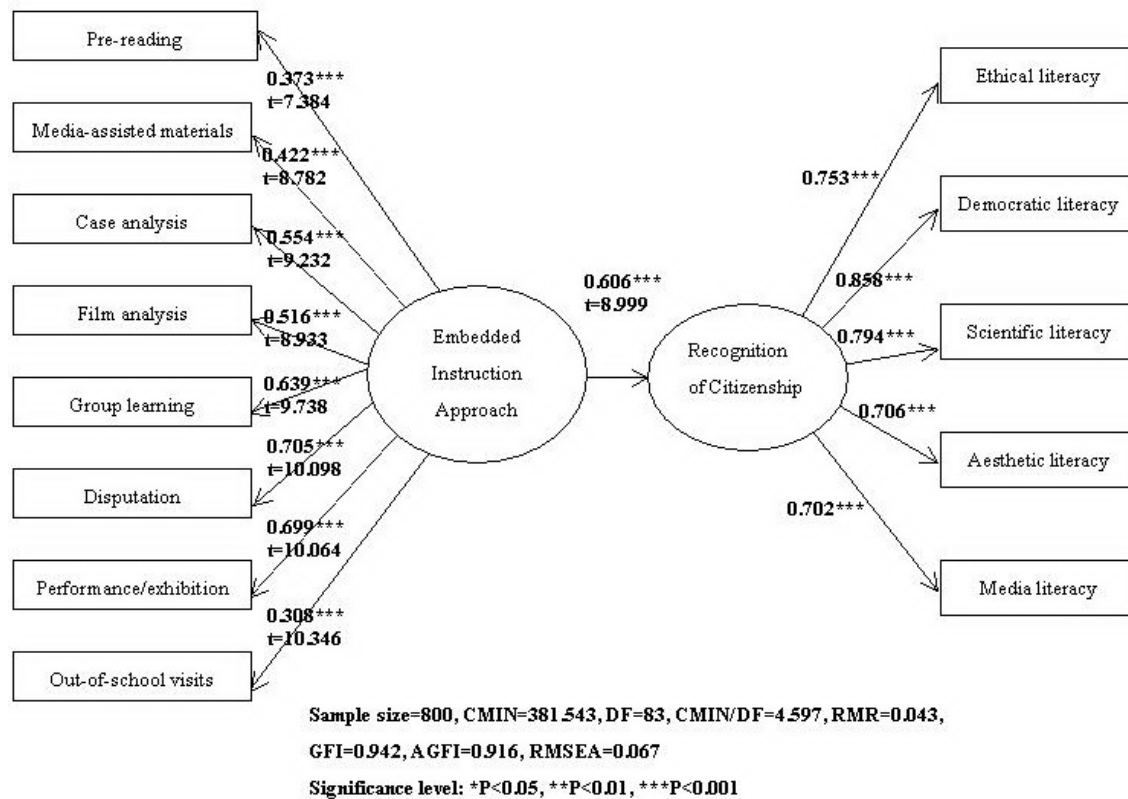
Sample size=800, CMIN=381.543, DF=83, CMIN/DF=4.597, RMR=0.043,

GFI=0.942, AGFI=0.916, RMSEA=0.067

Significance level: *P<0.05, **P<0.01, ***P<0.001

Figure 2: Path analysis of the model in this study

Table 4: Trait analysis of the four awarded embedded courses

Ranking	Course	Department	Course literacy	Teaching method and activity		Learning outcome assessment	
#1	Artistic Design Thinking and Cultural and Creative Aesthetics: Visual Plan Exhibition	Junior, Dept. of Computer Science and Communication	Aesthetics	1.	Visual theory and practice lecture	1.	Quality of visual theme design in public exhibition
				2.	Group Tasks for exhibition activities	2.	Outcomes of oral guidance in on-site exhibition
				3.	Group Cooperation for theme exhibition and on-site oral guidance	3.	Abilities of listening, speaking, reading, and writing
#2	Field Research and Practice: Pop Music	Junior, Dept of Taiwan Literature	Media; Aesthetics	1.	Pop music broadcaster visits	1.	Reports of pop-music signer biography
				2.	Fieldwork – singer interview	2.	Group presentation and peer assessment
#3	Disaster and Aboriginal Regulation Rebuilt	Junior, Dept. of Law	Ethics Democracy Science Media	1.	Disaster area field survey	1.	Records of disaster area field survey
				2.	Film viewing and discussion	2.	Reflection on aboriginal dilemma in Taiwan, case report review, and interactive argument
				3.	Group learning and extensive discussion		
				4.	Oral presentation, inquiry, and argument		
#4	Social Enterprise	Senior, Dept. of Social Work	Ethics; Democracy Science; Media	1.	Group learning	1.	Design outcome presentation of social enterprise activities
				2.	Record and discussion	2.	Peer assessment of group works and response to inquiries
				3.	Case discussion		
				4.	Interactive argument		
				5.	Study abroad		

This study attempted to explore the influence of teaching methods that instructors use in classes on the student recognition level of citizenship. The path coefficients in Figure 2 show that the *instruction approach* dimension positively influenced the *recognition of citizenship* dimension (path coefficient = 0.606, t = 8.999). In the dimension of instruction approach, all eight teaching methods showed significant effects, including *pre-reading* (path coefficient = 0.373, t = 7.384), *media-assisted materials* (path coefficient = 0.422, t = 8.782), *case analysis* (path coefficient = 0.554, t = 9.232), *film analysis* (path coefficient = 0.516, t = 8.933), *group learning* (path coefficient = 0.639, t = 9.738), *disputation* (path coefficient = 0.705, t = 10.098), *performance/exhibition* (path coefficient = 0.699, t = 10.064), and *out-of-school visits* (path coefficient

$= 0.308$, $t = 10.346$). *Disputation*, *performance/exhibition*, and *group learning* were the top three among these path coefficients. These three indicators can effectively characterize the *instruction approach* dimension. In addition, the hypothesis was validated.

**Qualitative Research: Case Analysis of the Courses**
University P held a campus "student learning outcome competition" after the first term of the Cultivating Citizenship Program ended. Enrolled students of the 37 professional courses that included embedded citizenship presented over 100 learning outcomes in written form. Thereafter, the university authorities invited intramural and extramural experts to review and rank these written reports. The study selected the top four ranked student works to analyze their traits, and the results are presented in Table 4.

The four awarded courses were characterized by extensive discussion between groups in group learning, on-site surveys, independent student cooperation and completion of tasks (e.g., planning exhibitions and oral presentations), and response to inquiries in public presentation. These learning processes were multiple citizenship learning activities, which included the training of listening, speaking, reading, and writing abilities. The main distinguishing factor between these courses was the type of citizenship included in the course. Literacies of ethics, democracy, science, and media were discernibly weighted more than aesthetic literacy.

DISCUSSION
The study applied both quantitative and qualitative investigations. The results show critical factors in cultivating citizenship, including instruction approaches and student learning contents.

First, citizenship education is not limited to class lectures with instructors. The core of the instruction should transform from the one-directional method of imparting disciplinary knowledge by the instructor to a method that cultivates student thinking ability. Thinking ability refers to the recognition abilities of students (i.e. disputation, analysis, and application). Xu (2012) indicated that the "recognition process orientation" approach focuses on student self-determination and reflective thinking, whereas instructors play a leading or assisting role. The approach also creates a teacher-student or student-student dialogic atmosphere, and guides students to combine academic knowledge with the real world through reflection and learning practice. The space in which citizenship education is conducted breaks the mold of the classroom and enters the real world that students live in. Through social participation and by experiencing the substantial impact of public issues, students can develop a notion of responsible social action. Figure 3 shows the recognition process orientation of citizenship education, which is a sequential learning and teaching process from in-class disputation and discussion to post-class practice and reflection.
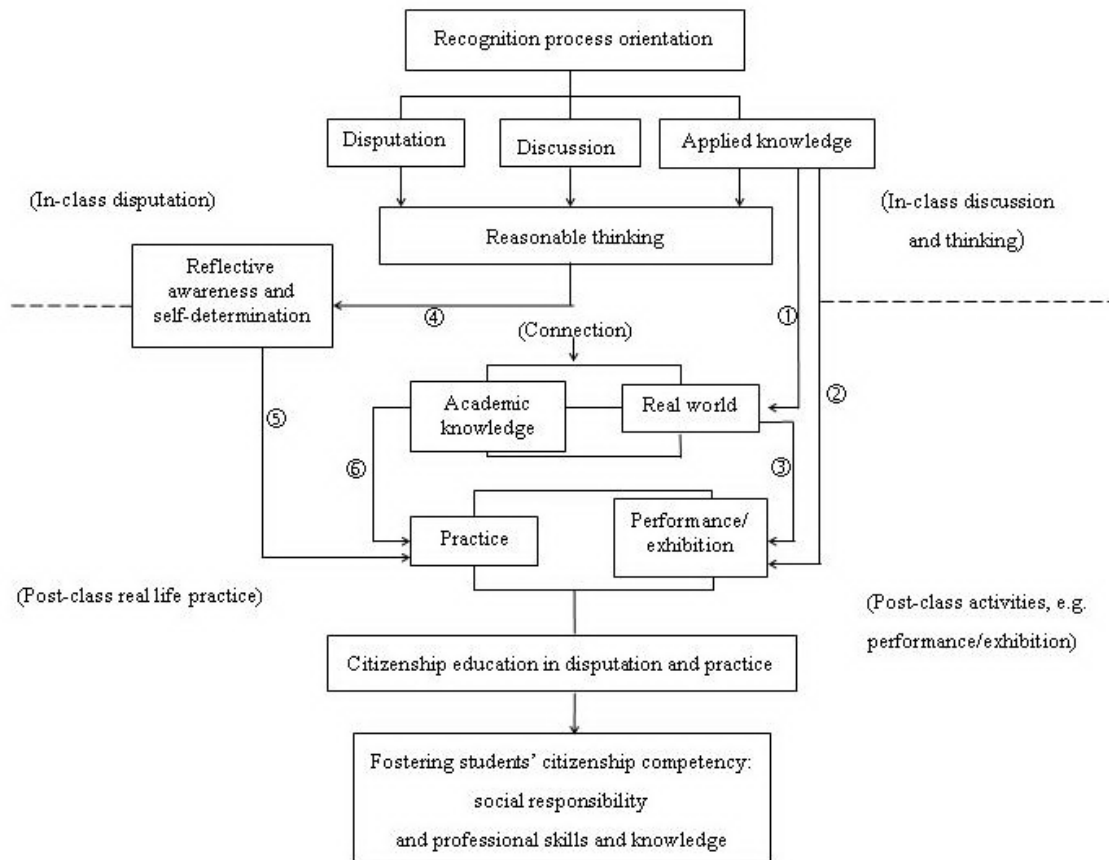
Figure 3: Diagram of the instructional framework of citizenship in disputation and practice

Source: This study

Second, all four awarded professional courses applied the embedded instruction approach of "disputation and practice" to foster students' citizenship at a high level. Arrow 1 in Figure 3 indicates that the courses applied to real life (e.g., fieldwork in pop music, disaster area surveys, or study abroad). Arrow 2 shows the transformation of knowledge into practical action (e.g., performance/exhibition). Arrow 3 indicates that the completion of learning outcomes was the formation of knowledge from the "real world."

In addition, Arrow 5 shows that the teaching methods in the four courses (e.g., group task planning for exhibition, group learning and extensive discussion, and interactive arguments) fostered students' reasonable thinking, self-determination, and reflective awareness, and then advanced their practical abilities (i.e., learned how to present their works). Finally, Arrow 6 shows that students transferred academic knowledge acquired in class to practice.

Third, the quantitative research results in this study showed that aesthetic literacy was recognized at the lowest level. The result corresponds to that of another survey in Taiwan (Chen, 2012a), which questioned scholars specializing in citizenship about the importance of the five literacies. The result showed that aesthetic literacy was recognized at the lowest level because the category of aesthetic is too broad to be defined. Therefore, cultivating aesthetic literacy may start with the implementation of public and social issues, and then the competency of aesthetic literacy can develop.

Nevertheless, the Artistic Design Thinking and Cultural and Creative Aesthetics course, which emphasized aesthetic literacy, ranked the first among the four awarded courses. The reviewers considered the course an effective embedded instruction approach for aesthetic literacy because it explicitly emphasized the competency of aesthetics. The course guided students in group learning and distributed group tasks for visual design exhibition. Students arranged and decorated the exhibition site and provided on-site oral guidance independently; these practices were the main reason the course was ranked first.

CONCLUSION

This paper has given an account of and the reasons for the widespread use of the embedded instruction approach for teachers to embed citizenship in various courses. Applying the embedded instruction approach can merge the separate lines of intellectual pursuit of liberal arts and science and develop humanistic literacy in professional curriculums by departing from the one-directional classroom lecture and focusing more on projects undertaken or experience in the real environment outside the classroom. Additionally, the embedded instruction approach has to combine with out-of-school sharing workshops to advance instructors' teaching methods and innovation in teaching. For example, the Taiwan MOE has hold 2 to 4 workshops of innovation in teaching each year from 2011 to 2014 for subsidized universities to share their implementation in the Cultivating Citizenship Program. These workshops then attracted extensive attention from many other universities in Taiwan to learn how to implement and improve citizenship.

The study provides a practicable framework to cultivate citizenship and serves as a reference for instructors or schools who are interested in implementing citizenship. Therefore, collating from the aforementioned results in the quantitative and qualitative research and the three contents in the discussion section, several conclusions are drawn as follows.

First, the hypothesis of that embedded instruction approaches positively influence the level of the student recognition of citizenship is valid. Future citizenship education can apply more practical teaching methods, such as group learning, disputation, and performances and exhibitions.

Second, civic literacies, such as aesthetic literacy, do not always have tangible definitions and practices. Some teachers may find effectively applying them difficult. However, through the application of practice-oriented learning with teaching methods fostering student interest in explicit knowledge, it is easier for different types of knowledge or civic literacies to spread. In addition, citizenship education improves if the creation of knowledge undergoes a sequential process of communication, diffusion, and systematization (Lozano, 2003).

Third, the study developed an instructional framework of citizenship in disputation and practice. The conceptual framework can function systematically to cultivate students' citizenship competency (i.e., the ability to combine social responsibility with professional how-to knowledge). It may be used in expanding the teaching and learning of citizenship education.

Finally, the study is limited to one sample, University P, because of its discernible and effective outcomes in implementing citizenship. The impedances of other universities in implementation are not discussed. This is perhaps a major research direction for future studies.

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THE USE OF ONLINE SOCIAL NETWORKS BY POLISH FORMER ERASMUS STUDENTS: A LARGE-SCALE SURVEY

Paweł Bryła, Ph.D.
Department of International Marketing and Retailing, Faculty of International and Political Studies, University of Lodz, Narutowicza 59a, 90-131 Lodz, Poland
e-mail: pbryla@uni.lodz.pl

ABSTRACT
There is an increasing role of online social networks in the life of young Poles. We conducted a large-scale survey among Polish former Erasmus students. We have received 2450 completed questionnaires from alumni of 115 higher education institutions all over Poland. 85.4% of our respondents reported they kept in touch with their former Erasmus colleagues. Unsurprisingly, it is the social networking website communication that largely prevails as the most frequent communication channel. Almost 2/5 of the study subjects considered it to be the most used in this context. We were interested in the patterns of use of social networking websites among our respondents. Although 10 social networks were included in the catalogue of answers, it turned out that only 4 of them played a significant role in our sample. The most popular was Facebook, which was number one in socialising with both local and international friends. LinkedIn and GoldenLine.pl were reported to serve mainly for professional purposes, including job searching and maintaining a professional network. The use of nk.pl was confined to contacts with local friends. 514 respondents, i.e. 21.7%, said they had created a group in a social networking website to keep in touch with former Erasmus student friends.

Keywords: online social networks; Erasmus; Poland; international student mobility; Facebook

INTRODUCTION
One of the principal tendencies in current university education is the internationalization process (Bryła 2012; Bryła 2010), which includes international student mobility. Poland, next to Turkey, is one of the most dynamic participants of the European student exchange programme Erasmus, even though certain obstacles to international student mobility persist (Bryła & Ciabiada 2014). A study period abroad is an important element of education, not only from the academic perspective, but also taking into consideration social, psychological, and cultural dimensions. We can also observe a rapidly increasing role of online social networks in education, job search and other areas of life of young Poles. This paper focusses on the use of online social networks among Polish alumni who took part in Erasmus a few years before. It is based on a large-scale survey, encompassing 14705 sent and 2450 completed questionnaires. In particular, we try to identify the relative importance and usage patterns of various online social networks in our sample as well as the role of these tools in communication of former Erasmus students with their Erasmus colleagues.

LITERATURE REVIEW
Communication has an important role in life and especially in education. Nowadays, lots of people generally use technology for communication (Yalcin 2012). Web 2.0 technologies serve as a good learning tool in which the learners find the opportunity to practice language in a real-like atmosphere: the new medium (Tilfarlioglu 2011). Global virtual student teams may move international business education forward (Taras et al. 2013; Taras et al. 2012). With the transition to being a knowledge-based society, the Internet usage has become an irreplaceable part of life. As socials networks have come into our lives, the internet usage has taken a different dimension. People can affiliate to social networks in order to make friends, exchange information, find partners, and to play games. Facebook is currently the most popular social networking service in the world. Facebook addiction levels of males are higher than those of females, and those of seniors are higher than those juniors, sophomores and freshmen (Cam & Isbulan 2012). Online social network usage purposes can be categorized under four categories, namely maintaining existing relationships, making new relationships, using for academic purposes and following specific agenda (Mazman & Usluel 2011). A positive and significant relationship was found among Facebook-related opinions stated by university graduates having an extravert personality as a result of data collected through the Eysenck Personality Questionnaire-Revised/Short-Form and Opinions of University Graduates about Social Networks data collection tools (Isbulan 2011). Social self-efficacy has a positive influence on social trust; social trust has a positive influence on social capital, and social trust mediates the relationship between social self-efficacy and social capital among Facebook users (Wu, Wang, & Liu 2012). The rapid development and expansion of the Internet and the social-based services comprised by the common Web 2.0 idea provokes the creation of the new area of research interests, i.e. social networks on the Internet called also virtual or online

communities (Musiał & Kazienko 2013). The institutions that have embraced social media say it has been well worth the effort, as they have engaged more prospective students and alumni using platforms that those constituents have already integrated into their personal and professional lives (Fernandez 2010).

It is Facebook that has become the most important social network in Poland. In late 2011, it overcame a national network called nk.pl as far as the number of real users is concerned. Nk.pl (previously called Nasza Klasa – *our class,* as it was first designed to connect former classmates) was created in 2006 and was the national leader until August 2011. The initial success of Nasza Klasa was analysed by A. Małachowski (2009). Facebook was created in 2004 in the United States of America, but played only a marginal role in Poland until 2010. During just 2 years its number of users soared 7 times to reach 11,725,422 in September 2011, which enabled it to take the position of the national leader according to the Megapanel PBI/Gemius research (**Figure 1**). The extremely high growth rate of the community of users was influenced by the evolution of Internet technologies, which were used as communication tools not only on computers but also mobile devices (*Facebook liderem...* 2011). Twitter, which is the second largest social network worldwide, is relatively less popular in Poland, with 1.2 million users in October 2011 (Internet Standard 2012: 10-11).
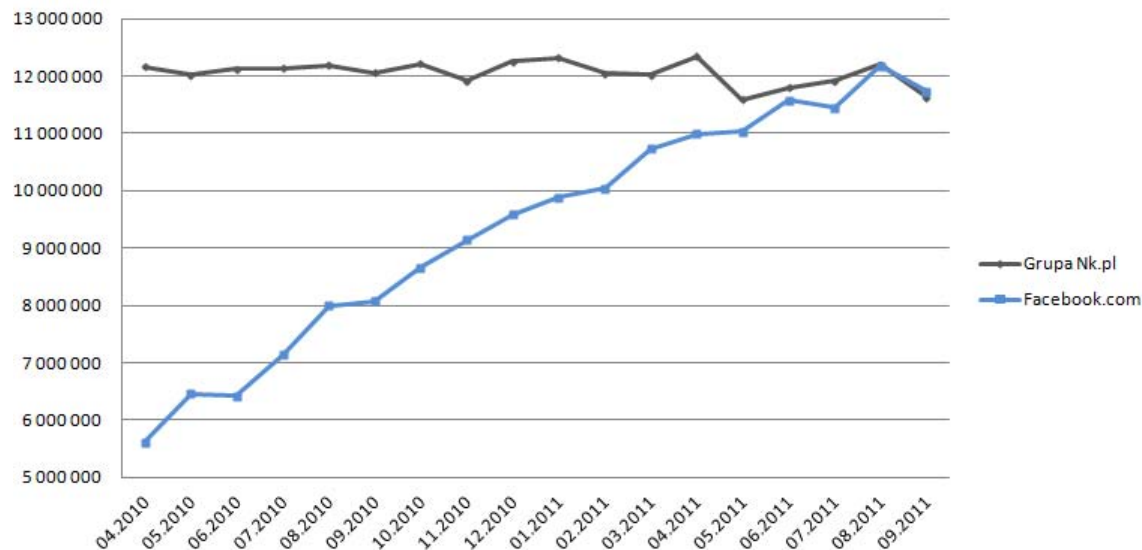

Figure 1. Evolution in the number of real users of facebook.com and nk.pl in Poland (04.2010-09.2011)
Source: (*Facebook liderem...* 2011)

Regarding social networks for professionals, the most popular one in Poland is called GoldenLine (belonging to one of the most powerful media groups in Poland called Agora SA). According to Megapanel data of January 2012, it had 2.1 million real users, whereas the world leader LinkedIn was used by about half a million of Poles. However, the position of LinkedIn is improving, as it set up a Polish version of the website in April 2012. It seems that both networks may survive on the Polish market, as they perform slightly different roles. GoldenLine is number one regarding headhunting on the national labour market, while LinkedIn is used mainly by foreign companies and Poles looking for a job in multinational corporations or abroad (Pająk 2012).

There are many Erasmus-related pages on Facebook. At the European level, it is worth noting: http://www.facebook.com/pages/Erasmus/37776696567 (Erasmus), which has 125,891 likes (on 10 August 2012), and http://www.facebook.com/esn (Erasmus Student Network) with 73,288 likes. At the national level in Poland, there are http://www.facebook.com/erasmuspolska (Erasmus Polska) with 3,544 likes and http://www.facebook.com/ESNPoland (ESN Poland) with 1,638 likes. Last but not least, there are numerous Erasmus student communities on Facebook at the university level, e.g. http://www.facebook.com/esnul (Erasmus Student Network Uniwersytet Łódzki) – 1,270 likes, and http://www.facebook.com/ESNEYElodz (ESN-EYE Lodz - Technical University of Lodz) – 1,757 likes, as well as other specialized pages, in particular those of international student offices, for instance http://www.facebook.com/pages/International-Students-Office-University-of-Lodz/149602198427324 (International Students Office - University of Lodz) – 616 likes. Another Erasmus group exists on GoldenLine in Poland: http://www.goldenline.pl/forum/socrates-erasmus-program with 1,253 members.

Sample characteristics and selected results
We invited to take the survey all Polish students who had filled in their evaluation forms on the website of the Foundation for the Development of Education System regarding their Erasmus mobility for studies in 2007 (5942 study subjects) and 2008 (6635 study subjects). We added to the sample all graduates from the Faculty of International and Political Studies of the University of Lodz (2128 study subjects) in order to create a control group of internationally immobile students and some representatives of various age cohorts. Thus altogether we addressed our questionnaire to 14705 Polish students through the Internet professional survey service called moje-ankiety.pl in November and December 2012. We received 2450 completed questionnaires. Therefore, the response rate amounted to 16.7%, which may be considered a very good result for this kind of research methodology, taking into account the length of the questionnaire and the associated time and effort required to fill it in.

2369 of our study subjects studied abroad for at least a semester or trimester, whereas 81 did not take part in such mobility. Out of the 2369 study participants who had had a study period abroad, 82.6% studied abroad once, 14.5% twice, 2.1% three times, and 0.7% more than 3 times.

27.7% of our respondents in the former international student mobility sample were males, and 72.3% were females. In the control group, there were 79.0% of females and 21.0% males. This result may be due to several factors, including the higher participation of women in university education and their higher propensity to take part in surveys.

We have obtained answers from former Erasmus students representing 115 Polish higher education institutions. Therefore, our sample is very diverse and resembles very well the general population of all Polish outgoing Erasmus students. Unsurprisingly, the ranking is led by the biggest state-owned universities. The top 5 include: University of Warsaw, Adam Mickiewicz University of Poznan, University of Lodz, University of Wroclaw, and the Jagiellonian University of Cracow. The third rank of the University of Lodz stems partly from its remarkable performance within the Erasmus programme and partly from the extension of our sample to other age cohorts from the Faculty of International and Political Studies. It is also worth noting the high positions occupied by technical universities, including the Technical University of Lodz, which was the 6th regarding the number of respondents. We were unable to identify the home university of almost 6% of our respondents due to incomplete data, ambivalent abbreviations, mistakes, and deliberate refusal to provide the information.

22.3% of the internationally mobile Polish students in our sample took part in their mobility at the Bachelor level of studies, 78.2% at the Master level, 4.6% at the doctoral studies level, and 4.1% said it was another level of studies (including 5-year studies leading to a Master, engineer studies, medical studies, non-degree studies, postgraduate studies, MBA, MFA, after completing studies in Poland, study sessions/certificates, a language course, a college, secondary school, a thematic Socrates course, a summer school, a research scholarship).

The study participants carried out their international student mobility usually in 2007 or 2008, which stems from our sampling method. The year of mobility ranges from 1997 to 2012 due to the inclusion of various age cohorts form the University of Lodz, with the vast majority of students taking part in Erasmus in 2007 and 2008.

Table 1. Our respondents by international student mobility host country

Host country	Rank	Number of respondents	%
Germany	1	261	11.02
Spain	2	181	7.64
France	3	173	7.30
Denmark	4	150	6.33
UK	5-6	108	4.56
Portugal	5-6	108	4.56
Finland	7	100	4.22
Belgium	8-9	95	4.01
Italy	8-9	95	4.01
Sweden	10	81	3.42
Netherlands	11	78	3.29
Czech Republic	12	69	2.91
Turkey	13	60	2.53
Austria	14	52	2.20
Greece	15	42	1.77

Slovakia	16	39	1.65
Hungary	17	29	1.22
Norway	18	28	1.18
Lithuania	19	21	0.89
Slovenia	20	20	0.84
Bulgaria	21	19	0.80
Ireland	22	13	0.55
Latvia	23	8	0.34
Estonia	24-25	6	0.25
USA	24-25	6	0.25
Cyprus	26	5	0.21
Canada	27-29	3	0.13
Romania	27-29	3	0.13
Russia	27-29	3	0.13
Iceland	30-32	2	0.08
Malta	30-32	2	0.08
Switzerland	30-32	2	0.08
Belarus	33-37	1	0.04
China (Hong Kong)	33-37	1	0.04
Japan	33-37	1	0.04
Syria	33-37	1	0.04
Ukraine	33-37	1	0.04
Not identified	x	502	21.19
Total	x	2369	100.00

Source: own research

The main destination countries for the student (first-time) mobility of our study subjects were: Germany, Spain, France, Denmark, UK, Portugal, Finland, Belgium and Italy (**table 1**). In total 37 host countries are represented in our sample, as it concerns not only Erasmus mobility, but all kinds of student mobility. Nevertheless, Erasmus accounts for a vast majority of destination countries mentioned by our respondents.

Table 2. The duration of the international student mobility

Mobility spell	Fraction
For the first time	
Less than a semester	0.033
A semester	0.629
A year	0.310
More than a year	0.022
For the second time	
Less than a semester	0.030
A semester	0.055
A year	0.044
More than a year	0.041
For the third time	
Less than a semester	0.007
A semester	0.006
A year	0.006
More than a year	0.012

Source: own research

Our respondents reported having taken part in international student mobility, which lasted (for the first time) usually a semester (62.9% of answers) (**table 2**). Less than 1/3 of the study subjects studied abroad for a year, and only 2.2% spent there more than one year. As far as the second and third-time mobility is concerned, its duration tends to be longer, but these are relatively rare cases.

As many as 85.4% of our respondents reported they kept in touch with their former Erasmus student friends. 13.8% answered negatively, and the question did not apply to 0.8%.

Table 3. The ways of keeping in touch with former Erasmus friends (fractions)

Contacts	R	7	6	5	4	3	2	1
Social networking website communication	1	0.576	0.114	0.064	0.031	0.012	0.010	0.033
E-mails	2	0.250	0.137	0.137	0.092	0.054	0.060	0.097
Face-to-face contacts	3	0.117	0.073	0.126	0.106	0.098	0.118	0.182
Phone calls	4	0.054	0.044	0.082	0.076	0.071	0.121	0.344
Other	5	0.027	0.012	0.011	0.014	0.002	0.004	0.113

Notes: 7 – the most frequent; 1 – the least frequent or none; R – rank
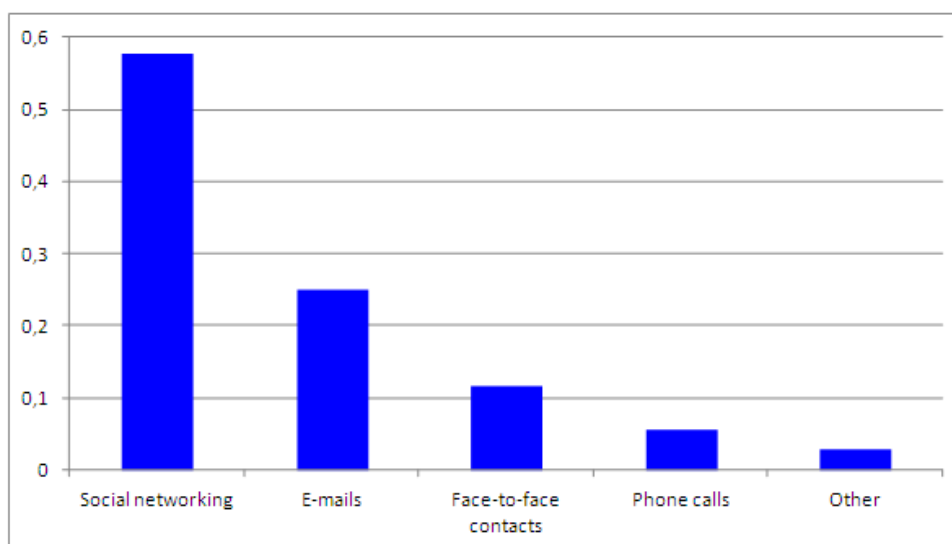Source: own research

Figure 2. The most frequent ways of keeping in touch with former Erasmus friends (fractions)
Source: own research

We asked the Polish respondents how they kept in touch with their former Erasmus friends (**table 3, figure 2**). Unsurprisingly, it is the social networking website communication that largely prevails as the most frequent communication channel. Almost 2/5 of the study subjects considered it to be the most used in this context. It was followed by e-mails. Face-to-face contacts and phone calls play a much less important role in this regard. The other options mentioned spontaneously by some respondents included Internet chats (including Skype and MSN), holiday postcards, traditional letters, text short messages sent by phone (SMS), and common journeys. However, the key role of online social networking should be emphasised.

Table 4. The use of online social networks by purpose (fractions)

Social networking website	PURPOSES				
	Educational	Socialising with local friends	Socialising with international friends	Job searching	Professional network
Facebook	0.157	0.784	0.852	0.038	0.098
LinkedIn	0.030	0.022	0.044	0.173	0.266
Twitter	0.013	0.011	0.015	0.003	0.016
MySpace	0.006	0.004	0.010	0.001	0.003
MyYearbook	0.000	0.001	0.000	0.000	0.000
SunSpace	0.000	0.001	0.001	0.003	0.005
GoldenLine.pl	0.030	0.022	0.008	0.184	0.223
Nk.pl	0.004	0.161	0.009	0.001	0.003
Xing	0.001	0.001	0.001	0.008	0.010
Tuenti	0.001	0.001	0.005	0.000	0.000
Other	0.005	0.006	0.010	0.003	0.008

Note: fractions of all those who took part in international student mobility (2369 study subjects)
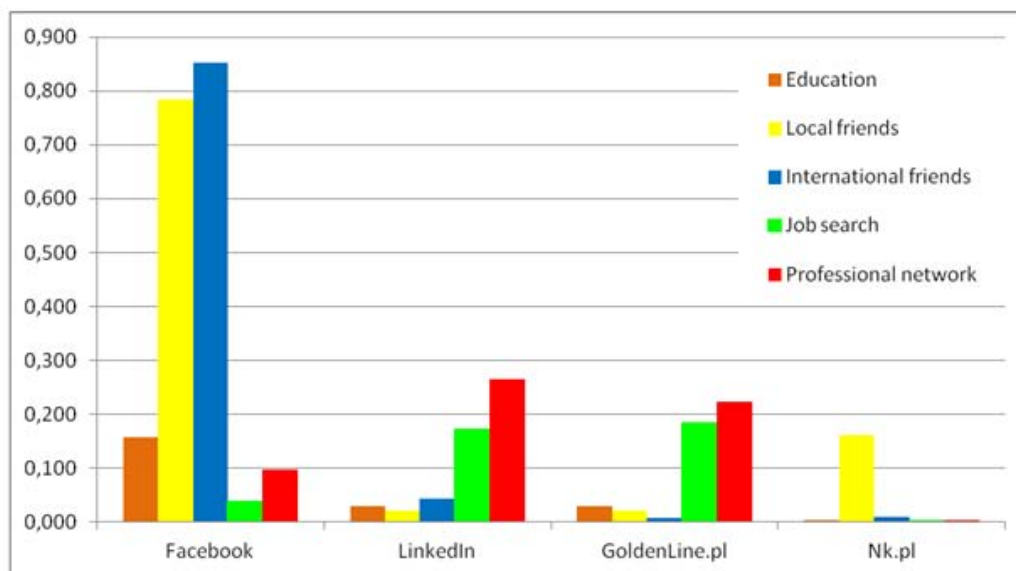Source: own research

Figure 3. The use of principal online social networks by purpose (fractions)
Note: fractions of all those who took part in international student mobility (2369 study subjects)
Source: own research

We were interested in the patterns of use of social networking websites among our respondents (**table 4, figure 3**). Although 10 social networks were included in the catalogue of answers, it turned out that only 4 of them played a significant role in our sample. The most popular was Facebook, which was number one in socialising with both local and international friends. LinkedIn was reported to serve mainly for professional purposes, including job searching and maintaining a professional network. The same was true for a Polish social network called GoldenLine.pl, the popularity of which was similar to LinkedIn. The fourth website called Nk.pl was used to keep in touch with local friends. We may expect that the popularity of global social networks will grow much more dynamically than their national counterparts. Twitter obtained less than 2% of users in each purpose category, but its prospects seem favourable. Educational purposes were not very common for any network, with the highest share of Facebook. The other online networks included in our question (MySpace, MyYearbook, SunSpace, Xing, and Tuenti) received only marginal attention (all functions below 1%). The respondents could supplement the catalogue with other networks they used, but very few took advantage of this possibility, which suggests that our analysis is complete. The few spontaneous additions included: Academia, Couchsurfing, Draugiem.lv, Google+, MeetUp, Mendeley, Netlog, Pininterest, Pracuj.pl, Profeo.pl, Reddit, Research Gate, StudiVZ, Tumblr, Viadeo, Vkontakte.ru.

As many as 514 our respondents, i.e. 21.7%, said they had created a group in a social networking website to keep in touch with former Erasmus student friends. 73.7% answered negatively and 3.7% mentioned it did not apply.

In the control group of students who did not engage in international mobility, Facebook is much more often used to keep in touch with local friends (72.8%) than with international friends (53.1%). It indicates an impact of the former international student mobility on the intensity as well as patterns of use of social networks.

CONCLUSION
Participation in international student mobility constitutes an important element of university education. However, its role extends far beyond the period of studies. It concerns both an enhancement of various competencies and skills and building a network of international friends. In 2012, we addressed our survey to all Polish alumni who took part in Erasmus in 2007 and 2008. A vast majority of our respondents reported they kept in touch with their former Erasmus colleagues. Unsurprisingly, it is the social networking website communication that largely prevails as the most frequent communication channel. Almost 2/5 of the study subjects considered it to be the most used in this context. The most popular online social network in our sample was Facebook, which was number one in socialising with both local and international friends. LinkedIn and GoldenLine.pl were reported to serve mainly for professional purposes, including job searching and maintaining a professional network. The use of nk.pl was confined to contacts with local friends. Over 1/5 of our study

subjects said they had created a group in a social networking website to keep in touch with former Erasmus student friends.

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