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Editorial

Just-In-Time training

Donald G. Perrin

Education is the process of receiving or giving systematic instruction in order to provide a foundation for personal advancement, intellectual growth and living in the future. The objectives are often broadly defined, using vague action verbs such as "understanding ….." The products of education include theory and practice, many subject matters, and intellectual skills such as critical thinking and problem solving.

Success in education is competitive, based on the individual's knowledge base and problem solving skills. Individual results are compared statistically on a curve. Results are not consistent; they differ from class-to-class and from year-to-year. On standardized tests, the results are compared against large populations on a year-by-year basis. Typically, the products of education are based on the criteria for university entrance, usually a list of completed courses and grades. Content and quality may not be consistent from one institution to another. Relevance to our dynamically changing world is also in question.

Training is to teach or learn a specific set of skills or behaviors, of practical value, to be implemented in a place of work or social setting. Objectives are specific and detailed. They describe the competency to be mastered, conditions under which successful learning will be demonstrated by actual performance, and the benchmarks or criteria that must be achieved to demonstrate success.

Thus, success in training is based on actual performance - physical, intellectual and collaborative (team) skills, measured against a set of benchmarks applicable to their job or profession. Titles make it simple to differentiate the range and level of skill needed as with Nurse, Physician-Assistant and Medical Doctor. It also designates role in a team such as Pilot, Navigator and Steward. While academia uses broad measures (courses completed and grades), training measures actual performance based on specific skills and criteria.

In 1962, Robert Mager proposed performance objectives as a better approach to design educational materials and curriculum. He outlined steps to define objectives based on performance, criteria, and conditions under which performance was measured. Action verbs determined the level of learning on Blooms Taxonomy of Behavioral Objectives. This became the foundation for instructional design by learning architects. The 60s introduced individualized instruction in a variety of forms such as language laboratories, programmed instruction and computer assisted instruction that have since become the basis of distance learning and created a need for students to develop skills in self-directed learning.

Unfortunately, educators were overwhelmed by size and complexity of the curriculum, the time required to develop performance objectives, and the difficulty of reorienting pedagogy to self-directed learning and higher levels of learning. While librarians were weeding their collections to get rid of books that were unused or no longer relevant, the curriculum snowballed to unmanageable proportions. And while technology provided powerful search tools, databases and the world-wide-web, education's traditional mission was increasingly out of sync with society as a whole. Standardized tests provided meaningless information for a command and control system that was no longer relevant. And even the best educators were over-ruled by the desires of politicians and well-meaning parent-teacher associations. Education is over-regulated, under-funded; and struggling to redefine its mission for the needs of the 21st century.

In short, much of what we once taught or did in classrooms is no longer relevant. Once upon a time we needed courses to learn how to use computers and software. Then menus that made it easy to find and use the resources within the software. We got help text that was specific to what we were doing, then videos and animations – Just-In-Time training for our specific need. Then computers became ubiquitous and everybody could use them. Just around the corner is artificial intelligence, automation, robotics, and a host of creative interactive tools to leverage learning and teaching and make us more productive.

Many teacher training institutions continue to turn out traditional teachers and administrators when the paradigm has changed from teaching to learning, from group to individualized, from manual to computer assisted, from lecture to interactive-multimedia, and from teacher-driven to self-directed learning. Thorndike in 1912 said books and media should be used for what they can do best, setting the teacher free to do what only human assistance can do. In an effort to control learning, we have taught students to conform, curbing their energy, intuition, creativity, and entrepreneurial spirit that is required for an increasing number of jobs in the 21st century. A paradigm shift is imminent for public education.

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Editor's Note: This is a carefully crafted and detailed study to ascertain insights, acceptance, and level of integration of international technology education standards into teaching in the public schools. Data is provided by teachers, administrators, students and the role of infrastructure, teacher training and professional development, curriculum, learning environments, technical support and funding.

Probing standardization in public schools curriculum: insights of teachers

Mansour Alwraikat
Jordan

Abstract

This study aimed to illuminate teachers' insights about the integration of international technology education standards in mainstream public school curriculum. The objective under scrutiny in this study is to probe the insight of teachers who graduated from the School of Educational Sciences in the University of Jordan. These teachers are working on teacher education in public schools, geared towards the integrating of international standards in technology education into school curriculum. A qualitative research approach was employed. Data was collected through semi-open interviews with (21) teachers. After analyzing the data, the teachers' responses were classified into the following major subjects with the following emerged minor topics: standards contribution to student and teacher learning, difficulties to integrate standards, and viability of professional development plans toward integrating educational technology. The study recommended the need to emphasize the importance of integrating international standards in technology education in all academic programs in the School of Educational Sciences and the public school curriculum.

Keywords: International Standards, Educational Technology, Teachers, Insights, the University of Jordan.

Introduction:

During the past decades, tremendous efforts have been channeled towards the formation of technological education standards to guide the integration of technology into curricula, and to shape teachers' preparation. Subsequently, the integration of technology education standards within academic programs has become a perennial one.

This study represents part of a research working series conducted by the researcher. It is relevant to the integration of international technology education standards in education by the teachers in public schools. In addition, this is part of the educational development program sponsored by the Ministry of Education in an effort to provide information to decision-makers, and those in charge of educational development project. This is with the aim of preparing their student in a more competitive educational environment. Additionally, this is aimed to shift attention to the urgent need to bring together the efforts of both the Ministry of Education and higher education institutions. It was done in order to raise the level of students commensurate with the scientific and technological progress and cognitive development in the current era.

Hence, the researcher believes that the major challenge is that scientific and technological developments have influenced educational systems. Also, he opines that the explosion of knowledge and the rapid exchange of information and data have made the process of employing the standards in learning and teaching students a challenge for educational systems. Despite the importance of using and integrating educational technology within the curriculum, the results of many studies (Merrow, 2002; Cuban, 2001) indicated that the use is still at a minimum. Also, teachers feel that technology is not applied effectively within the curriculum. This was regardless

of the integration of hardware, software and Internet networks, and having a sound understanding of educational technology by some teachers.

Willis and Montes (2002) indicated that pre-service teachers are in favor of education technology as a valuable apparatus for self and professional advancement. Sime and Pristley (2005) emphasized that even though numerous preliminary teacher education programs afford proper support for students to expand their proficiency, it is significant that the expansion of educational technology integration are supported by a realistic plan of basic skills.

The International Society for Technology in Education (ISTE) emphasized the significance of educational technology as a major constituent in designing professional educational programs and courses. This is accomplished through media to help students take advantage of educational technology (International Society for Technology in Education, 2002). To accomplish this objective, the ISTE developed standards for technology education for students and teachers relating to the following areas: Technology Operations and Concepts; Planning and Designing Learning Environments and Experiences; Teaching, Learning and the Curriculum; Assessment and Evaluation; Productivity and Professional Practice; and Social, Ethical, Legal, and Human Issues.

Furthermore, this study attempts to provide insights into the intricacies of employing international technology education standards into the public schools curriculum in Jordan. It is the conviction of this researcher that the role of these standards is decisive in integrating educational technology into the school's curriculum in a developing country.

Statement of the problem and research questions

Despite the importance of technology on the education standards in the curriculum, it has not received adequate attention from researchers. However, there is a scarcity of studies that highlight these standards, such as the results reached by the studies of Alsabri (2007) and Alfiqaawi (2007). These refer to the unavailability of these standards in courses and the lack of clarity in course objectives that focus on the cognitive part and neglect the practical one, alongside inadequate teaching and evaluation methods.

In any program appraisal, standards are the guiding principles to define student's performance. According to ISTE, literature technology education standards are the roadmap to teaching effectively and growing professionally in an increasingly digital world.

The researcher felt, through his work, that there is difficulty on the part of teachers in dealing with the knowledge content it contains. As a result, this has a significant effect on students' academic achievement in general. A complete program for teachers that focuses on successful technology integration can have a constructive influence on student's performance (Martin, Strother, Beglau, Reitzes, & Culp, 2010). Integrating technology into classroom teaching can be accomplished by initiating projects that assist teachers to meet the curriculum standards, cover content, and in employing school plans (Debele & Plevyak, 2012).

Therefore, this study came to highlight the insights that teachers hold towards the integrating of these standards. This can be an encouraging factor for educational leaders to follow innovative projects, gain a better understanding of student needs, and see the likely need for adaptations to curricular adjustments and homework. The study intends to answer the following question:

> What insights do teachers in public schools hold towards the integration of international technology education standards into their teaching?

Purpose of the study

This study aims to unfold the insights that teachers may hold toward the integration of international technology education standards in the public school curriculum. The knowledge of these insights is one of the indicators that affect teacher training and rehabilitation programs in the era of information and communication technology. Teachers represent the bridging tool between educational policies related to these standards and the educational field they might be practiced.

Significance of the dtudy

The importance of this study is to keep pace with the rapid changes and new developments in education. It is expected that the findings will help to identify training needs, as well as know teachers technological competencies that contribute to the implementation of teaching skills.

Operational definitions

International Technology Education Standards: They are phrases that describe the knowledge, attitudes, and the basic skills that should be mastered by teachers in public schools as a result of employing these standards and its educational performance indicators affiliate in related areas of technology that were developed by the International Society for Technology in Education (ISTE).

Insights: Views and ideas expressed by teachers about the importance of the integration of standards in teaching and learning, difficulties of integration, training programs, and the relevance of these standards into curriculum, through conducted interviews in this study.

Limitations of the study

- The study was confined only to teachers in public schools working as teachers.
- Results of this study were partly confined to the nature of procedures followed in the study.

National Education Technology Standards for Teachers (NETS)

Teachers have always represented the path to student's success. As a result, their role should be always refurbished. The ISTE standards assist teachers to identify the new skills and pedagogical insights teachers need to learn, teach, and integrate in the new digital age. The following is a list of these standards:

Technology operations and concepts

This standard refers to the importance of teacher's understanding of technology operations and concepts and basic technology literacy skills necessary for teachers to integrate technology productivity tools and other tools in the classroom. Moreover, it shows continued growth in IT skills education that is commensurate with technological developments. In fulfilling this, standard opportunities must be provided to learners through using technology in their own working projects and through the use multimedia, or desktop publisher ads in classroom work.

Planning and designing learning environments and experiences

This standard refers to the fact that teachers possess the knowledge and skills necessary for the use of educational technology in the planning and designing of educational experiences. It is consistent with the results of the educational research related to the use of technology in teaching and learning, and meeting the diverse needs of learners. Earle (2002) gave an indication of teacher preparation programs, training of teachers on technical skills, observing the use of educational technology by faculty members, giving them enough time to select educational materials that they will use, and evaluating educational outcome in terms of content and goals.

Teaching, learning and curriculum

This standard requires learners to use technology as an integral part of the educational process in implementing the curriculum, and in facilitating learning experiences in light of the content standards and technology standards of education. Therefore, the standard requires teachers to understand ways to use the technology available at the school. In addition, the skills to use the software also require the knowledge of management strategies of learners in the classroom (Brown, 2005).

Assessment and evaluation

This standard refers to teachers' possession of skills in using technology in facilitating the use of variety of teacher's evaluative strategies. It also uses technology in the access, analysis, interpretation, and retrieval of learners' data to improve teaching practices in the light of their data (Renzulli, 2005). This embraces the possession of skills to create and the use of grade-books; the use of diverse evaluative tools such as e-portfolios, computer educational games, and short quizzes available on the Internet; the development of criteria to evaluate students learning outcomes; and the provision of skills for immediate feedback to learners to adjust instruction accordingly.

Productivity and professional practice

This standard refers to teacher's use of ideas, teaching plans, and publications from professional bodies, courses in professional development provided on the Internet, participating in scientific conferences, and workshops to achieve sustainable professional development. In addition, it also involves the use of technological productivity tools, such as word processor, PowerPoint, database, Painter to develop the products of teachers, and use of mailing lists and e-mail services to communicate with colleagues and students and their parents in order to enhance learning.

Social, ethical, legal, and human issues

This standard refers to the understanding of teachers in terms of social, moral and human issues related to the use of technology in schools, and their ability to employ these principles while teaching. Here, the teacher is expected to refer to the ethical and legal issues relating to intellectual property rights when using hardware and software. In addition, they are expected to explain to the learners the importance of and how to cite resources in order to avoid the occurrence of cases of intellectual plagiarism. The standard refers to the awareness of teachers' capabilities of technology in dealing with individual differences among learners and the teaching methods appropriate for this purpose (Selverstone, 2003).

Importance of International Technology Education Standards for Teachers

The challenges facing our societies are many. Thus, the need have increased for everyone in the community to acquire the required skills and knowledge needed to develop and to fulfill their role in the community. This highlights the urgency of preparing highly educated individuals with better education. Among the most important steps to get this type of learners is to set high educational expectations for all students so as to determine what learners should know and can do (Shehata, 2005).

Mahmoud (2006, p. 452-454) summarizes the importance of these global standards as follows:

- Provide entrance criteria to judge the level of quality in a particular discipline.
- Provide criteria for judging the extent of progress towards achieving the goals, and the provision of a comprehensive vision for teaching and learning through a specific program to offer opportunities for excellence for learners.

- Provide prospects for cooperation, collaboration, and consistency in order to improve the process of learning and teaching in a specified educational field.
- Contribute to the development of courses through the adoption of excellent policies and practices and overcome the difficulties and constraints of the current structures for schools.
- The standards serve as a measure to assess the dimensions of teaching and learning.
- Educational standards provide a unified and coherent judgment.
- Educational standards help in meeting the criteria for educational excellence and the principle of equality.
- Standards provide educational situations which embraces the continuity of experience level from one educational level to another level and one school to another school.
- Standards provide opportunities to support the ability of teachers to help learners on the link between what they have learned from previous experiences and new learning.
- The standards represent a global touchstone to make judgments on different courses and their quality. Therefore, it can be used as a basis for reliable curriculum development.

Integration of International Standards in Technology Education

Some educators look to the use of technology in the field of education as a mere use of certain types of technology in teaching, such as computer–based teaching or computer managed instruction, self-learning, and individual learning and others. In spite of the significant role played by technology in the educational process of learning and teaching, and its positive effects and benefits in the development and improvement of outcomes and outputs of education, there are still some difficulties experienced by teachers in the education process or included in textbooks. However, various studies (Salamah, 1998; Alhalafawi, 2007; Sowaidan & Mobariz, 2007) cited some of these difficulties as followss: inadequate design of classrooms to fit equipment, hardware, tools, and educational materials; lack of teacher training materials on the production and use of educational technology and learning to deal with the devices, operations and maintenance; diminutive finance for the purchase of equipment and various materials; low awareness among teachers on the importance of employing educational technology; lack of appropriate evidence of technological educational materials to explain their use, time, and pressure on the teacher to complete vocabulary curriculum material; and the lack of teachers' enthusiasm and desire to identify ways and new methods in education.

Curriculum in the School of Educational Sciences has passed other educational curriculums at different stages of developments. In the past, the focus was only on the acquiring of information and the recalling of materials. Here, the curriculum in general did not witness experimental or practical applications. While the current curricula is characterized and based on a modern scientific view, it is manifested on expanding a more specialized scientific base for enabling students to pursue their university studies.

Accordingly, the role of teachers in educational technology era has changed in achieving the objectives of the curriculum. It has become more focused on directing students toward the discovery of scientific facts. This is also, in the light of the modern scientific educational philosophy, which is shaping the curricula of educational technology toward individualized instruction and cooperative learning. Furthermore, it is a more organized acquisition of knowledge, since these curricula is a distinguished educational approach (material and method) more than the teaching technical material.

Literature review

Subsequently, a considerable amount of literature can be obtained about integrating technology in general. Nevertheless, there are limited studies specifically focusing on teachers' insights toward integrating international technology education standards into the public school curriculum.

Studies conducted by Wynter (2008), Martin and Dunsworth (2007), Shtat (2006), and Alsabri (2007) highlighted some deficiencies in educational technology courses and in teachers' technological knowledge and skills. The results of the studies by Sharaf (2009) and Alfiqaawi (2007) showed that there is a lack of consistency for the percentages which described the areas of standards in education technology courses.

The studies of Toit (2015) and Betrus (2000) showed a shift in the attention of the education technology courses from focusing on learner's skills in using hardware and software to acquiring skills for integrating them into the educational process. In addition, a study by Shtat (2006) presented a proposal in shaping educational technology courses in the light of technology education standards for teachers.

Studies have shown no improvement in the record of teacher preparation programs that comply with the standards set by the (ISTE NETS) as indicated by the study of Monsakul, Espinoza, and Un (2007).

Zhang (2014) and Hofer (2003) presented some ideas related to the successful integration of technology education standards in teacher preparation programs. These programs include the use of teacher programs for more than one course in educational technology. In addition, it also includes the skills to use software that requires high technical skills and the integration of these courses with teaching methods courses.

Alghazo (2006) believes that the main challenge is preparing teachers to integrate technology into their teaching in order to help their students meet ISTE standards. Her study in the College of Education at the United Arab Emirates University revealed that instructors lacked many technological competencies. Thus, the instructors have different preferences of formats.

Researchers (Pajo & Wallace, 2001; Beaudin, 2002; Snoeyink & Ertmer, 2002; Bariso, 2003) indicated some common barriers to integrate technology into teaching: lack of computers, lack of quality software, lack of time, technical problems, teacher attitudes towards computers, poor funding, lack of teacher confidence, resistance to change, poor administrative support, lack of computer skills, poor fit with the curriculum, lack of incentives, scheduling difficulties, poor training opportunities, and lack of vision as on how to integrate technology.

Alhalafawi (2007) believe that some of the difficulties of using technology in education are related to the lack of educational goals to be used in education; the need to train researchers and teachers on the educational uses of multiple information and communication technologies, and equip them with the necessary training skills for their students; the need to equip students and classrooms with modern tools and equipment, and the failure to provide the necessary information on how to use them in education; the difficulty of establishing a precise timetable to be used and commitment by users; isolation imposed by the computer on the user, which makes him feel lonely and far away from his colleagues and friends; and some of what is published by means of modern technology contradicts the values inherent in the society.

Still, educational literature about technology education standards is ambiguous, particularly in a developing country such as Jordan. The literature for this new trend needs to be framed in such an organized and meaningful manner that can affect educators, teachers, students, educational environments, and various educational curricula.

Methodology of the study

The study relied on a qualitative approach through conducting semi-structured interviews with a selected sample of teachers in order to gain more depth into real world situations. The qualitative research is a way to conduct inquiry and investigation, which aims to understand people's experiences and perspectives in depth, and its history in the context of their personal and natural circumstances (Creswell, 2003). Therefore, the feature most obvious in qualitative research is to try to search for the truth (Patton, 2002). In the educational field, qualitative research helps in understanding the phenomena, generates theories, and develops and improves the educational practices (McMillan & Schumacher, 2001).

The participants

A purposive sample was utilized in this study which is considered as one of the most common qualitative sampling strategies. The participants were selected according to predetermined criteria related to specified objectives and research questions. The study sample was limited to teachers in public schools working as teachers. Highly qualified teachers in rich technology-oriented settings were selected during the first semester of the academic year 2016/2017 to conduct the study. Only 21 informants, 11 male and 10 female, hold a bachelor degree in teacher education. Their teaching experience ranged from 5 to 15 years and their ages were from 27 to 37. All of them are holders of an International Computer Driving License certificate (ICDL), (Intel), (WL), and a certificate in the use of technology (ICT). These certificates are used in teaching as part of a professional development program supervised and executed by the Ministry of Education. Thus, almost half of the participants (11) were trained in using e-learning applications, the majority (18) owned laptops and had experienced educational technology in their classes. Also, they can share their, insights, stories, and ideas.

Data collection

The researcher examined some documents relevant to educational technology use for teachers involved in the interviews, such as weekly schedule for computerized lessons, quarterly study-plans for teachers, a sample of students' artifacts in classrooms, and a sample of supervisors' reports for teachers in computerized lessons. The data extracted helped the researcher in formulating the interview questions.

A semi-structured interview was conducted to give participants the opportunity to express their personal views and thoughts regarding the integration of international technology education standards into curriculum. Conducting interviews helped to reveal informants own insights (Patton, 2002). The researcher believes that conducting observations or even document analysis to answer the research questions, is unfruitful.

Furthermore, the final interview questions consisted of 10 questions varied from behavior questions, feeling questions, and background questions (Patton, 2002). The questions covered: introducing questions, direct questions, follow-up questions, confirmation questions, and examining questions. Questions were formulated after returning to educational literature related to subject interviews and international technology education standards concepts within curriculum. Questions were sent to two evaluator experts in educational technology and teacher education. This is to enable them share their opinions concerning scientific accuracy, language formulation, and the role of questions in answering the main research question and fulfilling the goals of the study. The evaluators suggested some changes in the interview questions. The corrected interview questions were clear and not biased toward specific answers. The researcher conducted only one interview with each informant. All interviews were recorded and related notes were written. Each interview lasted from 15 to 25 minutes. All recorded interviews were transcribed on paper. The researcher hired an examiner who holds a bachelor degree in Arabic language to double check the transcription process.

Trustworthiness

The researcher incorporated some strategies to enhance the creditability of the study tool and ensure the trustworthiness of the findings:

- Avoiding personal biases in describing what teachers said during the interview which may influence the findings.
- Providing an opportunity for participants to comment on the interview transcript and reflect on their answers.
- Interview questions were built on information attained mainly from previous literature.
- Using digital tools to record interviews helped repeated revisiting of the data to check emerging themes and notes writen during interviews.
- Showing interview questions to a group of expert researchers in qualitative research to ensure its objectivity and clarity

The researcher

The researcher in this study holds a PhD in instructional technology, MA in computer education, and a BA in English language. He practices international technology education standards in his teaching courses at both graduate and undergraduate levels. He has experience in qualitative research theoretically and practically. Sharing the researcher experiences, values, beliefs, and background as well as his role in conducting a qualitative research project, enhances the credibility of the research (Patton, 2002).

Procedures of study

- Selecting a purposeful sample of participants who had experience in teaching and integrating international technology education standards, and those who have completed the ICDL.
- Conducting interviews in a safe and suitable environment; informants were interviewed in the computer lab.
- Recording interviews via digital tool and writing notes during and after conducting interviews.
- Showing transcriptions of interviews to informants to ensure their approval and listening to their own perspectives.
- Conducting analysis of data gathered through interviews.

Data analysis

Upon transcribing the interview data, it was coded and analyzed from the themes and patterns which were developed. Once the coding of the data was completed, a search for correlations, relationships, and patterns among the categories was conducted. The goal was to gain an understanding of the factors that influence teachers regarding the use of the international standards for educational purposes. The objective of the interview analysis was to look for ideas, patterns, and explanations of the teachers for the standards in their teaching work. Therefore, this process required organizing the data into meaningful units, categories, concepts, and themes. Marshal and Rossman (1995) define qualitative analysis as the process of bringing order, structure, and meaning to the mass of collected data by grouping the data into themes and looking for patterns in the responses.

To ensure a high level of analyzing our qualitative data and to handle issues of subjectivity and objectivity during the delicate process of analyzing the data, the researcher is fully open and aware that the human factor plays a significant role in the strengthening and weakening of qualitative inquiry and analysis. Therefore, the researcher followed a balancing act for data analysis by asking two teachers with an MA in educational technology and BA in teacher education to analyze the data. Both teachers and the researcher discussed their disagreement on some issues until they were resolved.

Most generated comments from insights about the integration of the international technology education standards by actual respondents (21) were provided in the form of short phrases and lists. Also, the length of the response ranged from 30 to 117 words with an average of 58 words each.

Results of the study and discussion

Intensive analysis of the gathered data from conducted interviews resulted in highlighting four main emerging insights by teachers. They are as follows:

FIRST:
Standard contribution for teachers in teaching subjects was classified into three categories

The results show that technology is not a distinct concept. It implies different things to different teachers, and the practices related to each idea lead to quite a number of different outcomes (Levin & Wadmany, 2006).

Group One*:* 12 (57%) of this group of informants believe that standards have an important role for teachers within their teaching profession for different subjects if they are utilized and integrated in a proper manner. Standards help to enhance teachers understanding of technology operations and concepts and basic technology literacy skills necessary for teachers to integrate technology productivity tools and other tools in the classroom. Complying with these standards will save teachers time and effort in preparing educational materials for classes. Also, it will help them in adequately executing and monitoring teaching subjects matter. Furthermore, it will assist in the selection of best practices in education; attract the attention of learners to educational issues; help teachers' access new knowledge; and provide access to information in education effortlessly and faster. It also facilitates the possibility to keep-up with new ideas found in modern scientific research and new studies in the subjects being taught by teachers. One of the teachers (male) stated that "Marvelous …..teaching our subject matters according to these standards is pretty significant." Another teacher (female) commented in this regard "for advancing our teaching process and keep-up with new inventions in our field….standards is a positive move for achieving this goal." In addition, a teacher (male) mentioned that "standards pave the road to integrate diverse techniques in teaching….and this will pay respect to [students with] diverse backgrounds and values."

Consequently, the researcher may attribute these remarks to teachers' confidence on the importance of educational technology in the development of the educational process as a result of either pre-service or post-service training. These findings support the study of Ma, Andersson, and Streith (2005) that stated the teachers' perceived usefulness of computer technology had a direct important effect on their intention to employ it.

Group Two: 6 (29%) of this group of informants indicated that standards are important for teachers in their teaching process. Nevertheless, there is limited importance in some cases (such as the provision of information and display themes). Also, the teacher cannot be relied upon completely, especially in terms of the direct contact between the student and the teacher. This is because this aspect is essential in covering moral and emotional aspects for the subject, as well as

the relationship between the teacher and the student. A teacher (male) commented by saying "we cannot rely on just standards in our teaching process…….despite its role in bringing joy and enthusiasm." Another teacher (female) stated that "not every aspect in teaching and learning should be standardized; teachers need some space in teaching certain aspects in their subject matter to their students……. We need to be vigilant."

However, these findings are in agreement with the study of Aşkar, Usluel, and Mumcu (2006) and Yi, Jackson, Park, and Probst (2006). Thus, their study reported that relative advantage, complexity, and result demonstrability are significant factors in predicting users' willingness to utilize technology. Therefore, support is required for successful integration involving the administration, technology professionals, and educators (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012).

Group Three: 3(14%) of this group of informants alleged that integrating standards into their teaching process are not beneficial. Teachers warn that standardization may limit teachers' skills, techniques, and styles in dealing with their students. Teachers assume that standards may restrict them from being creative and initiative in the way they teach and interact with their students. One of the teachers (male) stated that "standardization may cost us a lot in the future…..its just a tool…..it contradict with some pedagogical beliefs of teachers…its just a tool that will shatter the essence of our profession as teachers."

Bennett and Bennett (2003), who examined perceptions of teachers toward instructional technology and their willingness to employ it in their teaching, reported that the most significant factor which hinders the integration of educational technology was teachers' reluctance and their disbelief in the use of technology. In this regard, the researchers (Cuban, Kirkpatrick, & Peck 2001; Semple, 2000) believe that teachers disregard computers, and resist efforts to shift the teacher-centered teaching to a more student-centered classroom. In addition, the researcher may attribute that to teachers' educational beliefs and their personal theories (Albion & Ertmer, 2002; Scrimshaw, 2004; Lim & Khine, 2006).

SECOND:
Standards contribution for learners in learning subjects was classified into two groups

Group One: 18 (85%) of this group of informants assume that standards have a great impact on learners learning different teacher education subjects. These standards represent a criterion for evaluating the success of educational programs, offering framework for those in charge of educational institutions and the designers of the curriculum and teaching materials. This is accomplished by selecting the technological knowledge and skills of education that students should acquire in their grades. Furthermore, standards may ensure opportunities for learners to use technology in their own working projects. In addition, Standards help students in practicing creativity and innovation, communication and collaboration, research and information fluency, critical thinking, problem solving, and decision-making.

One teacher (female) stated that "indeed standards encourage students to conduct research and master information fluency…..it's a must." Another teacher (male) refers to standards as "a means for urging students to be more innovative in searching for knowledge and learning." A passionate young teacher (male) describes standards as "a motivation force which opened its hands for those who are willing to change for good before it's too late." These findings correspond to what Debele and Plevyak (2012) advocated in using technological innovations.

Group Two: 2 (10%) of this group of informants presume that standards should support educational situations which entail a momentum of experience through different educational levels from schools to universities. Therefore, informants in this group are not optimistic regarding the existence of a wide spectrum toward standards. In this regard, one of the teachers

(male) declared: "I am suspicious about the lasting of new innovations such as standards….I think it's just a short wave of thoughts….then it will vanish." Another teacher (male) expressed his fear that standards may not be genuine. He stated: "most educational innovations are stripped out of its core due to false understanding of approaching authentic educational enterprises."

Teachers' recognition of the significant of standards to student in learning different subjects is manifested in their conviction of the role standards play in facilitating students learning and enhancing their academic achievement.

In addition, the researcher may attribute these finding to external factors such as culture. For instance, based on the findings of an intercultural study carried out in three countries, Japan, Switzerland, and the United States using the Technology Acceptance Model, it was indicated that TAM holds for both the U.S. and Switzerland, but not for Japan, implying that the model may not predict technology use in all cultures (Straub, Keil, & Brenner, 1997).

Third: Difficulties to integrate the standards. Insights of teachers resulted in emphasizing the difficulties that hinder the integration of standards into their teaching and learning. These difficulties are expected, if we take into account the fact that experience with standards is still in the process of growth and development. Furthermore, this is in addition to the fact that teachers are yet to go through this experience thoroughly.

Knowing the scope to which these difficulties influence learners, teachers and institutions may assist in making a decision on how to tackle them. However, data analysis indicated that difficulties can be classified into four main groups.

Difficulties Related to Teachers: This involves some teachers' unconstructive perceptions about the standards; lack of incentives for teachers; teachers' conviction that integrating the standards is not a priority in the top agenda of the Ministry of Education; lack of adequate, ongoing training and professional development for teachers to wisely integrate the standards into their classrooms; lack of evidence to clarify and facilitate the process of integrating international standards by teachers; the size of materials and insufficient lessons reduces the use of standards; shortage of raw materials and educational devices available in teaching classes; and the use of technology needs a lot of time in the preparation phase. In this regard, a teacher (male) mentioned: "still we teachers are late adaptors of new types of instructional technology." Another teacher (female) stated: "we lack a proper instructional model to integrate the standards."

The findings regarding the difficulties commensurate with Hew & Brush (2007) analysis results of 48 empirical studies. The study indicated that the most frequently cited difficulties affecting technology integration related to teachers are teachers' knowledge and skills, and teachers' attitudes and beliefs. In addition, Medlin (2001) found that teachers' motivation played an integral factor in improving their teaching techniques among their students via employing technological resources. In fact, teachers are welcomed to construct understanding from students' practices (Belenky, Clinchy, Goldberger, & Tarule, 1986; Jacobs & Becker, 1997).

Difficulties Related to Students: Students, in most cases, are reflection of their teachers. The lack of a specific technology plan to achieve clear educational goals was a major setback to integrate educational technology in accordance with international standards. Also, few students use technological research tools in the discovery, evaluation, and compilation of information from a variety of sources. Furthermore, few students use technological tools to protect their data and the results of their reports. Moreover, weakness of student assessment and selection for information sources, techniques or technological innovations, and selection, suits the performance of new tasks. Besides, few students use technological resources to solve problems and make decisions on a scientific basis. Additionally, one of the weaknesses of students is the use of distance technological communication tools to participate in the publishing process, and to

cooperate with each other. Few students use technological tools to strengthen the learning process and increase their creative productivity.

Within the shadow of these answers, a teacher (female) stated that "despite training courses, a part of ICDL certificate, there is still no obvious plan for educational technology integration that is (sic) been articulated." Another teacher (male) expressed his own frustration from training courses and technology certificate gained by teachers by mentioning that "it's the same mess wherever you go ….same stuff."

Many research studies have found that the utilization of technology contributed dramatically to enhancing the classroom teaching and learning process. In addition, students' academic achievement has been promoted. It is extremely vital to connect content to students' lives (Markert, 2003; Jacobs & Becker, 1997; Sanders, Koch, & Urso, 1997).

Difficulties Related to School Environment: The school environment plays a significant role in moving its members to the next level of excellence. Nevertheless, school environment may still represent a main setback in depriving its members of progress, modernity, and prosperity through opposing new trends in the teaching process.

Computerized classroom environments are similar to non-computerized classrooms. Furthermore, there is a failure to use technology for the evaluation and assessment in some schools. This is because evaluation and assessment represent an integral factor for educational change. In addition, comfort with the status quo is a reflection of the resistance to change policy advocated by some teachers and school leaders. A teacher declared "computerized classroom environment are similar to non-computerized classroom."

The findings commensurate with what Hew and Brush (2007) indicated that the most frequently cited difficulties affecting technology integration related to teachers are resources.

Difficulties Related to Technical Issues: Overwhelming school education depends on memorization as a rigid material, far from reality, and does not stimulate thinking. Thus, curriculum content needs to join in consequential manners with students' prior experiences and practices and their real life (Zuga, 1999). As a result, there is no real connection between theory and real life. It is essential to make content relevant to students life experiences (Wills, 2001). This undermined the efficiency to integrate the international standards to assess the performance of teachers, students, and curriculum. Also, there is no solid technology infrastructure within schools. An example is the lack of educational technology experts in schools to help integrate the standards within the subject matter. Furthermore, poor training on the use of international standards is a major setback to all the efforts geared toward integrating educational technology. In addition, lack of international standards to the element of thrill. One of the teachers (female) emphasized that "we need specialist in educational technology to facilitate the transition to utilizing international standards within curriculum; unfortunately, we still believe that computer science teachers with no prior experience in instructional design, curriculum change, and learning theories can do the job!" Another teacher (male) expressed: "there is no clear vision or goals for teachers' professional development."

The findings aligned with Makaramani (2013). In her report study, she outlined that the major challenges in integrating technology are human resources and professional development for teachers, as well as administrators and educational personnel at all levels. Additionally, the findings of this study were articulated by Salamah (1998), Alhalafawi (2007), and Sowaidan and Mobariz (2007).

Difficulties Related to the Educational System: Mainly, teaching overload for teachers results in unenthusiastic teachers for integrating the standards. Furthermore, the curriculum itself is so massive to be covered. Therefore, no special professional development models were adopted to

go along with integrating new technologies. In addition, there is lack of sufficient computer labs within schools to integrate educational technology except for computer classes which mainly has to do with teaching computer skills. A teacher (male) recapitulates this case by stating "standardization mandating tailoring of curriculum and innovating new procedures that are more engaging to both teachers and students." Another teacher (female) stated: "even thinking of utilizing these standards is time consuming; how about properly integrating them into our teaching." A teacher (male) touched on the availability of computer labs stating that there is "lack of fairness in the allocation of computer labs to teach non-computer subjects which reflected negatively on the integration of technology."

The research studies focusing on the barriers to use technology reveal that the insufficiency or lack of technology facilities appears as significant barriers (Beggs, 2000; Bussey et al., 2000; Lee, 2000; Braak, 2001; Butler & Sellbom, 2002). Frequencies and percentages of teachers' responses for each item were calculated.

Table 1
Frequencies and percentages of difficulties reported by teachers

Difficulties		Frequencies	Percentages
Teacher	Unconstructive perceptions about the standards.	11	%52
	Lack of incentives for teachers.	13	%61
	Teachers' conviction that integrating the standards is not a priority in the top agenda of the MOE.	15	%71
	Lack of adequate, ongoing training and professional development for teachers.	16	%76
	Lack of evidence to clarify and facilitate the process of integrating standards by teachers.	8	%38
	Size of materials and insufficient lessons reduces the use of standards.	14	%66
	Shortage of raw materials and educational devices available in teaching classes.	11	%52
	Use of technology needs a lot of time in the preparation phase.	9	%42
Student	Lack of a specific technology plan to achieve clear educational goals.	15	%71
	Few students use technological research tools in the discovery, evaluation, and compilation of information from a variety of sources.	8	%38
	Few students use technological tools to protect their data and the results of their reports.	4	%19
	Weakness of student assessment and selection for information sources, techniques or technological innovations, and selection, which, suit in the performance of new tasks.	2	%9
	Few students use technological resources to solve problems and make decisions on a scientific basis.	5	%23
	Weakness of students' use of distance technological communication tools to participate in the publishing process, and to cooperate with each other.	3	%14
	Few students use technological tools to strengthen the learning process and increase their creative productivity.	4	%19

Difficulties		Frequencies	Percentages
School environment	Opposing new trends in teaching.	12	%57
	Computerized classroom environment are similar to non-computerized classroom.	10	%47
	Failure to use technology for evaluation and assessment in part of schools.	6	%28
	Comfort with the status quo is a reflection of the resistance to change policy advocated by some teachers and school leaders.	11	%52
Technical issues	No real connection between theory and real life.	15	%71
	No solid technology infrastructure within schools.	12	%57
	Lack of educational technology experts in schools to help integrate the standards within the subject matter.	14	%66
	Poor training on the use of international standards.	7	%33
	Lack of international standards to the element of thrill.	5	%23
Educational system	Teaching overload for teachers reduces interest in integrating modern technologies, and employing international standards.	17	%80
	Unenthusiastic teachers as a result of the massive curriculum to be covered.	16	%76
	No special professional development models are adopted to go along with integrating new technologies.	13	%61
	Lack of sufficient computer labs within schools to integrate educational technology.	15	%71

Therefore, the results showed a variety of difficulties reported by the respondents. Reaching its entirety from insights by teachers' to 28 items, and after calculating frequencies and percentages in Table 1, the results indicated several conclusions which can be displayed as follows: The item "teaching overload for teachers reduces interest in integrating technologies and employing international standards" got the highest percentage among all the difficulties (80%). The item "Lack of adequate, ongoing training and professional development for teachers" and the item "Unenthusiastic teachers as a result of the massive curriculum to be covered" scored 76% in the second place. The item "Weakness of student assessment and selection for information sources, techniques or technological innovations, and selection, which, suit in the performance of new tasks" scored only 9% in the last place.

The researcher noted a disparity in frequencies related to difficulties, which may be attributed to a variety of factors related to the curriculum, teachers and others. Thus, this includes: provide all the technological tools necessary for teachers and offering teachers advanced training courses with modern technology-related education. In addition, the researcher attribute that to the difference in the way of life, cultural and social influences in the community, which in turn affect the manner on how to integrate current technological techniques in learning and teaching by teachers (Pinheiro, Campbell, Hirst, & Krupa, 2006).

FOURTH:

Viability of professional development plans toward integrating educational technology

Insights of teachers about the benefit of training on educational technology provided by the Ministry of Education (MOE) for teachers were divided into three groups as follows:

Group One: It is represented by eight teachers (38%). They believe these training courses as part of professional development programs offered by the (MOE) are beneficial, and what teachers must go for. This is because it helps them to apply newly acquired skills in the educational process. A teacher (male) highlighted that the "existence of such programs is wonderful," and teacher recapitulate that "it's a priority for every teacher."

The researcher likely thinks that those teachers' courses, related to educational technology in graduate or undergraduate level, may lead to a reduction in the scale of the fundamental difficulties related to the integration of international standards. Educational school cultures play a vital role in providing environments that are fitting to learning. Also, they incorporate tools that offer teachers proper workshops and training courses (Avalos, 2011).

Group Two: It is represented by seven teachers (33%). They believe these training courses are helpful, but they believe that there is a real confusion between the concepts of e-learning and educational technology by the MOE. This was despite their overlap in different issues. Most of the trainers refer to e-learning applications as educational technology. The teachers articulated that: the best practices for professional development plans must examine effective approaches for integrating educational technology into classroom instruction; the teachers should be grouped and even trained in sessions depending on their specialization in order to exchange their experiences; the timing and duration of the training courses are not suitable; the training courses should be reconsidered through conducting an authentic assessment and evaluation; professional development programs must be tailored to meet teachers' needs of what will be integrated into their lesson plans; teachers should have access to continuous support during the school year; and pedagogy practices must be addressed besides the type of technology that is needed.

A teacher (female) stated that "it's a good start….we can build on this experience and extend it to incubate modern approaches of integrating educational technology." Another teacher (male) explicated "these professional development programs should be ongoing ones…..during teachers study as students in universities, colleges, and after graduation." A young teacher (female) even demanded going beyond existing (MOE) professional development programs by stating that "teachers should have the chance to visit other countries to be exposed to modern approaches of integrating educational technology that meet international standards." A passionate teacher expressed frustration by wondering "why not hire a technology coordinator in every school….to help teachers integrate educational technology."

The findings are recapitulated by Pepe (2016) who expressed that there is a need to conduct a research on professional development and the impact it has on teachers and their classroom practices. In addition, these findings were advocated by Infodev (2015).

Group Three: It is represented by six teachers (29%). They think these training courses are not useful because of the following reasons: the coaches are not fully qualified and some do not have a degree in instructional technology; the goals of these professional programs should be learning *with* technology rather than learning *about* technology; the dominant school culture is not the one that supports a learner-centered pedagogy, which facilitates a more successful integration of educational technology as advocated by Kim (2013); schools are not yet fully equipped to support teachers to apply the outcomes of such professional development programs; and chools curriculum was established based on a traditional philosophy that cannot yet incubate innovations in teaching and learning such as e-learning and m-learning environments.

A teacher (male) stated that "being an apprentice is cool….but the outcomes of these programs are not worth the time and effort of a teacher." Another teacher (female) geared his anger toward the MOE for not supporting schools in their preparation of their teachers. He stated that there is "not enough financial resources being subsidized for technology integration or even incentives for teachers."

These findings are articulated by Avalos (2011) who asserted that successful professional development programs for teachers do not inevitably meet the needs of all teachers. Also, these findings are expressed by the study of Salamah (1998), Alhalafawi (2007), and Sowaidan and Mobariz (2007).

Recommendations

Depending on the results of this study, the researcher recommends the following:

- Organizing training and professional development workshops for teachers within their areas of specialization, and support them with latest technology resources to provide them with necessary technological skills to help them in overcoming the difficulties that impede the integration of international standards.
- Encourage teachers to use and employ international standards in the educational process by offering them a type of incentives.
- Pedagogy knowledge content with technology should be addressed, especially those focused on students-centered role and constructivist educational philosophy.
- A quality and application assurance system must be developed to articulate a plan to continue to secure teachers; improve quality standards for the performance of teachers; and modernize academic programs, schools' curriculum, and study plans to keep pace with modern global trends.

Conclusion

In conclusion, the present research unfolds some insights by teachers toward integrating educational technology mediated through international standards into school curriculum.

The international standards entails that the educational system starts from physical requirements for the classroom and the availability of high-quality equipped classrooms with modern technology, a supportive and motivating environments for learners, and a meaningful curriculum and lesson plans that will be taught and that is compatible with the scientific and technological development in different levels. Furthermore, hiring highly qualified and efficient faculty members and teachers with a truthful desire in disseminating of science and knowledge is of significant importance. Typically, the better the classroom environment, the demand for the use of technology, and the shifting toward adopting the international standards for education reform, the sooner we will succeed.

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Editor's Note: This is a rigorous study to determine the impact and level of adoption of International Technology Education Standards in institutions of higher education in Jordan.

A glimpse at international technology education standards in higher education institutions

Mansour Alwraikat

Jordan

Abstract

This study aimed to examine student teachers' inclination toward the utilization of international technology education standards, in the curriculum in the School of Educational Sciences at the University of Jordan in Amman, Jordan. The study sample was selected in a randomized stratified manner and consisted of (250) male and female graduate and undergraduate student teachers during the fall of 2014/2015. A survey approach was conducted via a self-administered questionnaire consisted of (55) items. Both validity and reliability were secured for the questionnaire. The findings showed no statistically significant differences in student teachers' estimates with regard to their gender on all dimensions, except for the dimension "technology operations and concepts" in favor of female student teachers. In addition, no statistically significant differences in student teachers' estimates with regard to their academic qualification on all dimensions, except for dimensions "technology operations and concepts", and "social, ethical, legal, and human issues" in favor of graduate student teachers. Furthermore, no statistically significant differences in all dimensions of the questionnaire were found due to student teachers' educational experience.

Keywords: International Standards, degree of availability, technology education, student teachers, Jordan.

Introduction and background of the study

Research has indicated that a professional integration of some aspects of educational technology is a result of pedagogical teachers toward embracing innovative technology (Teo, Lee, & Chai, 2007).

A constructive approach to incubate educational technology will promote its integration in classroom activities. Teachers' knowledge of the effectiveness of utilizing new technologies is also significant (Ma, Andersson, & Streith, 2005). Plumm (2008) argued that teacher in general have a great tendency toward using productive aspects of educational technology in classroom learning.

It is implicit that student teachers' represent forcing agents for adopting educational technology in the educational system; therefore, it is very important to explore student teachers' readiness in adopting educational technology standards through relating how their gender, academic qualification, and educational experience during their university study may affect their opinions toward these standards.

The International Society for Technology in Education (ISTE) stressed the significance of educational technology as a means to plan professional educational programs and courses. In order to accomplish this mission, students should be empowered through training them to be capable in making use of educational technology (International Society for Technology in Education, 2002). The ISTE developed standards for technology education for students and teachers involving the following areas (Renzulli, 2005; & Selverston, 2003): technology operations and concepts, planning and designing learning environments and experiences, teaching, learning and the curriculum, assessment and evaluation, productivity and professional

practice, social, ethical, legal, and human issues. These standards gained momentum globally; they have been adopted and practiced in many educational systems around the world, such as England, Australia, China, Ireland, and Latin America. ISTE has periodically revised these standards since they were introduced in 1993, and they were modulated in 2000, 2007 and 2008 to keep pace with new innovations in educational technologies (Coklar & Odabasi, 2009).

Hence, the University of Jordan started to modernize curricula for its academic programs; among them are programs in the School of Educational Sciences that have been developed to take into account scientific and technological developments, and to help them solve problems and think critically. The idea is for student teachers to focus on conceptual, pedagogical forms of educational technology rather than mastering only hardware and software.

Consequently, the University of Jordan initiated a plan to integrate educational technology within its academic programs to support student learning, prepare them to work in a knowledge economy, and to reduce their marginalization. Additionally, one of the university's main goals is "improving the effectiveness of faculty members at UJ to strengthen the learning process amongst students, boosting their personal, social, academic and technological abilities" (ju.edu.jo). This initiative harmonizes with the vision of the Ministry of Higher Education and Scientific Research, to accredit and apply quality assurance to all higher education institutions operating in Jordan.

In the premise of unequal involvement of females in technology education, male perspectives and interests tend to pervade (Sanders, Koch, & Urso, 1997; Welty, 1996). Studying factors such as gender, academic qualification, and educational experience of student teachers represents a constructive advancement in tackling the process concerning technology adoption in developing countries since the integration of technology education standards in higher education institutions is still insipid.

Statement of the problem and research questions

This study intend to enlighten policy makers at the University of Jordan to recognize gender, academic qualification, and educational experience effects if they hope to effectively endorse international technology education standards within academic programs (Belenky, Clinchy, Goldberger, & Tarule, 1986; McIntosh, 1983; Welty, 1996; Zuga, 1999).

Therefore, this study is a contribution to the debate on gender in educational technology, academic qualification, and educational experience. Vassiliou (2009) believes that "gender differences in education must be taken into account when developing policies and strategies to improve educational outcomes" (p. 3). In a developing country like Jordan, gender inequalities is to a certain extent a result of the prevailing masculine culture that shapes academia. In addition, gender equity must be tackled which refers to "fairness of treatment for women and men, according to their respective needs. This may include equal treatment in rights, benefits, obligations, and opportunities" (UNESCO 2000, p. 5).

In the University of Jordan, co-education exists for student teachers' with procedures of gender equality. These procedures acknowledge the biological distinction between men and women, but discards the notion of male and female stereotypes, discarding the assumption that favors men over women. Co-education involves educating girls and boys equally in an environment beyond those gender characteristics which the general public set for each sex (Crosato. Morandi & Satti, 2005, p. 65). These are indicators of the fact that demographic variables do have presumptions on technology utilization by student teachers. Consequently, this study aimed to answer the following question: Are there any statistically significant differences in the degree of availability of international technology education standards in student teachers' estimates in the School of Educational Sciences attributed to their: gender, academic qualification, and educational experience?

Purpose of the study

This study aims at enlightening the overall state of student teachers' in terms of education technology standards. In particular, it seeks to identify any disparities in student teachers' estimates of the degree of availability of international standards in technology education from student teachers' point of view in the Faculty of Educational Sciences in light of their gender, academic qualification, and educational experience.

Significance of the study

The findings of this study may benefit: Student teachers, academic departments, faculty members, students, supervisors, and computer administrators. Departments may benefit in guiding their faculty members to seize advantage of modern technology in the delivery of knowledge and information for students, follow-up of faculty members through classroom visits and stand on their understanding of technology in education and the degree of proficiency that they own.

Limitations of the study

1. The diverse programs of study and courses at the School of Educational Sciences are limitations that are not controlled in this particular study, and are considered outside the range of this study.
2. The findings may not be applied to community college student teachers', or academic programs in Jordanian private universities.

Definition of terms

Operational definition:

International Technology Education Standards: Phrases that describe the knowledge, attitudes and basic skills that should be mastered by student teachers in the Faculty of Educational Sciences. These standards were developed by the International Society for Technology in Education (ISTE) as performance indicators for related areas of technology. These standards were measured through getting responses of student teachers in the Faculty of Educational Sciences on specified items in a questionnaire.

The concept of standards

Standards a plural word its singular "standard", which means, "what is measured by the other", or a model of what the examined object should be. It represent views of outcomes of various psychological, social, scientific, and educational dimensions, when being applied, we may discern the true image of the subject being measured, or reach a judgment as to the object that being measured or examined. The standards refer to "those phrases by which to determine the appropriate level of mastery and desired content and skills, performance and learning opportunities and standards for teacher preparation" (Zaiton, 2004, p. 115).

National Educational Technology Standards for Teachers (NETS)

The purpose of these standards is to guide institutions that prepare learners to integrate educational technology into their programs (Alkaleel, 2007). These standards come under six major areas: technology operations and concepts, planning and designing learning environments and experiences, teaching, learning and the curriculum, assessment and evaluation, productivity and professional practice, and social, ethical, legal, and human issues. Every standard includes all of the criteria to define performance indicators that all students and teachers should perform regardless of their specialties. The American National Council for Accreditation adopted these standards and asked student teacher preparation institutions to adhere to them as a constituent of their commitment to academic accreditation. The following a list of these standards:

Technology operations and concepts:

This standard refers to the importance of teachers' understanding of technology operations and concepts and basic technology literacy skills necessary for teachers to integrate technology productivity tools and other tools in the classroom. Moreover, show continued growth in IT skills education commensurate with technological developments. To fulfill this standard, opportunities must be provided to learners through using technology in their own working projects using multimedia, or desktop publisher applications in classroom work. In addition, using web browsers, word processor, excel, desktop publisher, drill and practice, inspiration, simulation software, Web design, and familiarity with the skills of e-mail and databases.

Planning and designing learning environments and experiences:

This standard refers to teachers that possess the knowledge and skills necessary for exploiting educational technology in the planning and designing of educational experiences consistent with the results of educational research related to integration of technology in teaching and learning, and meeting the diverse needs of learners. This requires as (Earle, 2002) indicates of teacher preparation programs, training of student teachers in, with technical skills, and observing the employment of educational technology by faculty members, and giving them enough time to select educational materials that they will use, and evaluating educational outcomes in terms of content and goals.

Teaching, learning and the curriculum:

This standard requires learners to employ technology as an integral component of the educational process in implementing the curriculum, facilitating learning experiences in light of the content and technology standards in education. The standard requires teachers to understand ways to utilize the available technology in schools and to apply skills to use software, it also requires knowledge of management strategies for learners in the classroom (Brown, 2005).

Assessment and evaluation:

This standard refers to student teachers' possession of skills in using technology, to facilitate use of a variety of teacher evaluative strategies, to use technology for access, analysis, interpretation, and retrieval of learners' data and to improve teaching practices based on their data (Renzulli, 2005). This embraces the possession of skills to create and utilize grade-books implement diverse evaluative tools such as e-portfolios, computer educational games and short quizzes available on the Internet, the development of criteria to evaluate students learning outcomes, and provide skills for immediate feedback to learners to adjust instruction accordingly.

Productivity and professional practice:

This standard refers to the teacher's use of ideas, teaching plans, and publications from professional bodies, courses in professional development provided on the Internet, participating in scientific conferences and workshops to achieve sustainable professional development. In addition, embracing technological productivity tools such as a word processor, PowerPoint, database and painter to develop the products for learning, and the use of mailing lists and e-mail services to communicate with colleagues and students and their parents in order to enhance learning.

Social, ethical, legal, and human issues:

This standard refers to the understanding of student teachers to social, moral and human issues related to integration of technology in schools, their ability to employ these principles while teaching. We should encourage student teachers ethical behavior on the technological frontier. The student teacher is expected to refer to the ethical and legal issues relating to intellectual property rights when using hardware and software, and to explain to the learners the importance of how to cite resources, in order to avoid the occurrence of cases of intellectual plagiarism. The

standard refers to the awareness of the teachers' capabilities of technology in dealing with individual differences among learners, and teaching methods appropriate for this purpose (Selverstone, 2003). In addition, the standard refers to provide a robust suite for learners with opportunities to employ technology in a fair and equal manner regardless of social, class, and ethnic differences. The performance indicators and general preparation for student teachers prepared by the (ISTE) identify basic skills that should be owned by student teachers to shape a productive and human future.

New roles of teachers and learners in the light of International Standards in Technology Education

The roles of teachers who employ international standards in technology education, are appraised in a range of roles including, as pointed out by Kotaite and Kherissat (2009), the role of commentator using technical means, where the teacher presents lectures for students or classroom situations, aided by the computer, the Internet, and technical means, including audio and visuallk; to enrich and clarify ambiguous points, afterward students are asked to use this technology as sources for research and conducting projects. As well as the role of the teacher, manifested in being a supporter of interaction in the educational process; assist in tutoring students on the use of technical means and interact with them by encouraging asking questions and inquiring how to utilize the computer, to acquire diverse knowledge and encourage them to communicate with other students and teachers who use e-mail and the Internet.

The teacher fulfills his role by encouraging students to generate knowledge and creativity: where the teacher encourages students to employ technical means on their own and to innovate and create educational programs for learning. These roles of teacher need to allow students a degree of control upon the content to be learned, and ask questions related to general concepts and viewpoints. Shehata (2005) confirms that the learner is the focus of the learning and teaching process and the learner is responsible for actively doing assisted learning through various techniques involving educational facilities, programs, strategies, and methods of thinking. For this to happen, certain principles need to be agreed upon by nearly every educated worker in the field of education and psychology and can be achieved through technological techniques, namely: the learner learns by himself through learning-by -doing and self-learning, learning is improved by organizing the learning materials step-by-step, directly and individually, to learning fully before moving to the next step.

Literature review

A substantial body of literature already exists concerning acceptance and use of educational technology in academia. However, there are limited studies specifically focusing on student teachers awareness with regard to their gender, academic qualification, and educational experience toward international technology education standards as a reliable tool in helping to advance teaching and learning. In a study conducted in Turkey by Sirin and Duman (2013) findings showed that self-efficacy levels of teacher candidates for educational technology standards had no significant difference in terms of gender, which means both male and female teacher candidates utilized educational technology standards at the same high level.

Koohand (2004) examined university students who were enrolled in an undergraduate hybrid program regarding their views towards utilizing a digital library and found that males had considerably higher positive perceptions than females. Enoch and Soker (2006) studied students' use of web-based instruction at an open university. They found that there had been a constant increase in use of the Internet for both female and male students. Still, the differences between the males and females were significant. Male students were more apt to use web-based resources as an addition to the printed resources.

Zhang (2005) reported that gender was not a significant factor in terms of college students' interest for distance learning. Davis and Davis (2007) reported that no statistically significant difference was found on overall perception of computer competence due to gender. Thompson and Lynch (2003) found male faculty were more confident in their ability to manage and perform internet course procedures than women faculty.

Anduwa-Ogiegbaen and Isah (2005) reported that there were no statistically significant differences between male and female faculty in their internet usage. Gerlich (2005) found that gender did not have a significant function in faculty perceptions of teaching online. Campbell and Varnhagen (2002) believed that some computer applications in education, such as self-paced tutorials, are not suitable for women who are more relational learners than males. Gender stereotypes in the use of technology are not working for the benefit of women.

An instructor's perception of teaching shapes his or her way of using technology (Mitchem, Wells, & Wells, 2003; Zhou, Brouwer, Nocente, & Martin, 2005). Research on instructors' pedagogy shows that female instructors' are inclined to merge curricular and instructional decisions in their students' personal experiences (Elijah, 1996; Lacey, Saleh, & Gorman, 1998; Robin & Harris, 1998). Campbell and Varnhagen (2002) reported that males are more likely to select technology first and then think about its application in teaching, whereas females tend to focus first on their instructional needs (pedagogy) before the technology itself.

Previous studies established that academic qualification is one determinant aspect to predict ICT integration (Pijpers, Bemelmans, Heemstra, & van Montfort, 2001; Zhu & He, 2000; Valletta & MacDonald, 2003; Olatokun, 2009; Alampay, 2006a; The International Telecommunication Union, 2003; Kusumaningtyas & Suwarto, 2015).

Olatokun (2009) highlighted that academic qualification had the strongest impact on the use of ICT among educated people. Academic qualification was found to be the leading demographic variable predicting ICT usage among science teachers in Nigeria (Aramide, Ladipo, & Adebayo, 2015). This is in line with the findings reported by Tezci (2010) and UNDP (2011) that emphasized academic qualification as a major determinant of ICT use. Educational qualification was found to be the strongest predictor of ICT use among the demographic variables ahead of ICT use experience and teaching experience.

Finally, few concrete and tangible studies teach and explain how student teacher academic qualifications can play an active part in integrating technology education standards into their teaching and learning. Different findings were reported concerning the influence of years of experience of teachers and ICT use in many studies. Mueller, Wood, Willoughby, Ross, & Specht (2008); Abu-Obaideh, Ab Rahim, Ramlah, & Asimiran, (2012) found no significant relationship between teachings experience of teachers and their use of ICT in teaching, while results of a study conducted by Inan and Lowther (2009) found that years of teaching experience affect teachers' use of computer technology in a negative way. In addition, Kalogiannakis (2008); Ertmer (2005); Bebell, Russel, & O'Dwyer, (2004) pointed out throughout their research that teachers' years of experiences influence the teachers' technology use in teaching. Science student teachers with more educational technology experience had greater intentions to use educational technology and believed more in its value. Kadijevich and Haapasalo (2008) found that student teachers' experience with educational technology is so important that it can help to improve student interest and intention to use educational technology in their classes.

Studies have indicated that pre-service teachers' working with an experienced teacher was an essential measurement of their educational technology training (Brent, Brawner, & Van Dyk, 2002; Doering, Hughes, & Huffman, 2003). Student teachers are more willing to employ educational technology in their teaching. Research findings showed that experienced teachers appear unwilling to integrate educational technology in teaching practices, while student teachers

are more self-assured exploiters of educational technology (Galanouli and McNair, 2001; Madden, Ford, Miller, & Levy, 2005; Andersson, 2006). A study conducted by Smarkola (2008) that incorporated 160 student teachers and 158 experienced teachers established that both groups of teachers acknowledged the requirement for supplementary computer-integrated preparation. A Study carried out by Ozdamli, Hursen, & Ozcinar (2009) reports that it is more difficult for experienced teachers to adapt to the use of educational technology in their classroom activities. Therefore, it is very important to incorporate educational technology into science student teachers' training. A review of previous studies unfolds the tendency for designing and guiding teacher preparation and evaluation programs and educational technology courses in light of international technology education standards (NETS). Moreover, to identify and seize advantage of modern methods to advance teacher preparation programs, it is important to recognize the extent of students' gains from application of those standards (Sharaf, 2009; Wynter, 2008; Alfiqaawi, 2007; Martin & Dunsworth, 2007; & Hofer, 2003).

Lambert, Gong, and Cuper (2008) related the impact of an educational technology course designed according to ISTE NETS-T on the perception of student teachers' to their level in the use of educational technology and attitudes towards it, and the resulting impact of educational-level and experience on their attitudes towards the exploitation of educational technology. It is worth mentioning that previous studies covered a wide spectrum of subjects. A number of studies focused on evaluating technological courses offered in universities as Sharaf (2009) and Shtat (2006) and Almikhlafi (2010). Others evaluated technological and computer courses in schools as with Alfiqaawi (2007) and (Wynter, 2008). In addition, several studies aimed to identify the impact of educational technology courses on promoting technological skills of learners and studying variables such as the learners' attitudes towards technology and previous experience in the use and teaching methods for teaching educational technology and its impact on the capacity of the learners technological and attitudes towards it (Lambert, Gong & Cuper, 2008; Anderson & Maninger, 2007; Martin & Dunsworth, 2007; Kim, Aagard & Nabb, 2005).

Results of the studies by (Sharaf, 2009; and Alfiqaawi, 2007) showed that the availability of educational technology standards is acceptable. A study by (Betrus, 2000) showed a shift in attention of the education technology courses from focusing on learners' skills in using hardware and software to acquiring skills of integrating them into the educational process. A study by (Shtat, 2006) proposed shaping educational technology courses in the light of technology education standards for teachers. Several studies, such as (Sharaf, 2009), applied descriptive analytical methods in agreement with our current study. Hofer (2003) likewise used national technology education standards (NETS) in the preparation of the theoretical framework, construction of the study tool, and interpretation of results of the study. Finally, the current study is characterized in its reliance on international technology education standards in building the study tool.

Methodology of the study

The study relied on descriptive analytical approach, which deals with the reality, and identifies the factors influencing it in terms of the nature and relations between them.

The study population

The study population consisted of all student teachers enrolling in academic programs in the Faculty of Educational Sciences at The University of Jordan in Amman, Jordan, during the academic year 2014/2015, according to the statistics department in the admission office at the University of Jordan.

The study sample

The study sample inventory was chosen from student teachers who graduated from the Faculty of Educational Sciences at the University of Jordan and work in the field of teaching. A purposive randomized stratified sample of 250 male and female student teachers was selected during the first semester of the academic year 2015/2016.

To ensure independent variables representation, academic programs with high (female, male) enrollment were selected. Academic programs were chosen that require at least one technology education course for its graduate and undergraduate students, student teachers working as teachers; therefore, the study sample was balanced for sake of statistical analysis.

Instrument of the study

Survey methodology was employed to collect accessible and valuable data from the intended population. The researcher developed the questionnaire by examining previous surveying methods in the literature, and items were written to explain and reveal International technological education standards in a developing country. The questionnaire consisted of two sections: the first included demographic information about the participants such as gender, academic qualification, and educational experience. The second consisted of 55 items distributed on six areas.

Validity of the study

As explained by Smith and Glass (1987), face validity assesses whether items developed looks valid to the examinees who take it. After designing and developing of the questionnaire items in the initial stage which were distributed in six major areas, and to ensure face validity of the study tool, a group of 20 student teachers who study at The University of Jordan were given the instrument to comment on the clarity of items. As another measure of validity, content validity used recognized experts to evaluate whether items developed in a scale assess defined content. More rigorous statistical tests were used to assess face validity. Therefore, the questionnaire was sent to (10) experts in educational technology, measurement, and curriculum and instruction to judge the degree of appropriateness of items in each area in terms of language formulation and clarity, and fit within the area to be measured. some items were adjusted, added or deleted. The final questionnaire for participants consisted of 55 items.

Reliability

Reliability is achieved through the consistency, stability, and dependability of the results (McMillan, 1997). To ensure reliability of the scale being utilized, a test and re-test method was performed on (25) student teachers' from outside the study sample. , the same tool was re-applied to this group after two weeks. The reliability coefficient was extracted by calculating the Pearson correlation coefficient between the first and second application (0.86). This was acceptable for the purposes of this study.

Results of the study

Results for the research question: Are there any statistically significant differences in the degree of availability of international technological education standards in student teachers' estimates in the Faculty of Educational Sciences attributed to their: gender, academic qualification, and educational experience?

Gender:

To determine any statistically significant differences between the mean scores of student teachers' estimates to the degree of availability of international standards, means, and standard deviations of student's estimates with regard to their gender (male, female), were calculated for all the dimensions in the questionnaire. In addition, an independent samples t-test was performed to test the significance of any difference between the means. The results are shown in Table1.

Table 1
Means, standard deviations, and results of t-test with regard to student teachers' gender.

Dimensions	Gender	Number	Mean	St. D	t	Sig.
Technology operations and concepts	male	149	3.81	.57	4.74	.031
	female	101	3.95	.41		
Planning and designing learning environments and experiences	male	149	3.88	.59	2.88	.142
	female	101	4.01	.42		
Teaching, learning and the curriculum	male	149	4.02	.52	2.92	.125
	female	101	3.98	.39		
Assessment and evaluation	male	149	3.84	.78	.363	.561
	female	101	3.73	.62		
Productivity and professional practice	male	149	3.91	.68	.069	.774
	female	101	3.88	.63		
Social, ethical, legal, and human issues	male	149	3.92	.46	4.52	.061
	female	101	3.93	.34		

Results of t-test showed no statistically significant differences between the mean scores of students with regard to their gender on all the dimensions of the questionnaire at the level of ($\alpha = 0.05$), except for the dimension "technology operations and concepts" were the value of calculated t were (4.74) and this is statistically significant (at p = 0.05), (0.31), and in favor of female students with a mean (3.95).

Academic qualification:

To determine any statistically significant differences between the mean scores of student's estimates to the degree of availability of international standards, means, and standard deviations of student's estimates with regard to their academic qualification were calculated for all the dimensions in the questionnaire. In addition, an independent samples t-test was performed to test the significance of any difference between the means. The results were as shown in Table2.

Results of t-test showed no statistically significant differences between the mean estimates of students with regard to academic qualification on all the dimensions of the questionnaire at the level of ($\alpha = 0.05$), except for the dimensions "technology operations and concepts" and the dimension "social, ethical, legal, and human issues" were the values of calculated t were (4.92), (4.67), and these were statistically significant (at p = 0.05), (0.29), (0.33), and in favor of graduate students with means of (4.03), (3.93).

Table 2
Means, standard deviations, and results of t-test with regard to student's academic qualification.

Dimensions	Academic qualification	Number	Mean	St. D	t	Sig.
Technology operations and concepts	BA	151	3.88	.60	4.925	.029
	Graduate	99	4.03	.41		
Planning and designing learning environments and experiences	BA	151	3.96	.59	2.243	.137
	Graduate	99	3.97	.42		
Teaching, learning and the curriculum	BA	151	3.82	.53	2.756	.100
	Graduate	99	3.98	.39		
Assessment and evaluation	BA	151	3.65	.67	.337	.563
	Graduate	99	3.73	.62		
Productivity and professional practice	BA	151	3.63	.68	.078	.781
	Graduate	99	3.86	.62		
Social, ethical, legal, and human issues	BA	151	3.81	.46	4.670	.033
	Graduate	99	3.93	.33		

Educational experience:

To determine any statistically significant differences between the mean scores of student teachers' estimates to the degree of availability of international standards, means, and standard deviations of student teachers' estimates with regard to their educational experience were calculated for all the dimensions in the questionnaire. The results were as shown in Table 3.

Table 3
Means, standard deviations with regard to student teachers' educational experience.

Dimensions Educational experience	Less than 5 years		6 to 10 years		More than 10 years	
	Means	St. D	Means	St. D	Means	St. D
Technology operations and concepts	3.95	0.53	3.90	0.57	3.92	0.58
planning and designing learning environments and experiences	3.97	0.47	3.95	0.61	3.96	0.58
Teaching, learning and the curriculum	3.91	0.43	3.91	0.53	3.66	0.53
Assessment and evaluation	3.81	0.63	3.63	0.64	3.46	0.68
Productivity and professional practice	3.78	0.63	3.67	0.59	3.57	0.88
Social, ethical, legal, and human issues	3.90	0.42	3.84	0.42	3.75	0.44

Means scores in Table 3 show differences in student teachers' estimates of the degree of availability of international standards with regard to their educational experience in the above dimensions, and to determine any statistically significant differences between the mean estimates of students with regard to their educational experience, a one-way analysis of variance (ANOVA), was performed. The results were as shown in the Table 4.

Table 4
Results of analysis of variance (One-Way ANOVA) with regard to student teachers' educational experience.

Dimensions	Source of Variance	Sum of Squares	Df	Mean Square	F	P
Technology operations and concepts	Between groups	0.081	2	0.005	0.39	0.72
	Within groups	46.84	247	0.107		
	Total	46.79	249			
Planning and designing learning environments and experiences	Between groups	.073	2	.036	.183	.89
	Within groups	48.910	247	.198		
	Total	48.983	249			
Teaching, learning and the curriculum	Between groups	.008	2	.004	.062	.94
	Within groups	15.928	247	.064		
	Total	15.936	249			
Assessment and evaluation	Between groups	.006	2	.003	.031	.97
	Within groups	26.024	247	.105		
	Total	26.031	249			
Productivity and professional practice	Between groups	.022	2	.011	.037	.96
	Within groups	73.176	247	.296		
	Total	73.197	249			
Social, Ethical, Legal, and Human Issues	Between groups	.039	2	.019	.031	.96
	Within groups	154.400	247	.625		
	Total	154.439	249	.036		

The results in Table 4 showed that there were no statistical significant differences in all dimensions of the questionnaire due to student teachers' educational experience. Where results indicated no statistically significant differences for the dimension "technology operations and concepts" due to students' educational experience, where $p = (0.72)$, (at $p < 0.05$).

Also, the results indicated that there were no statistical significant differences for the dimensions "planning and designing learning environments and experiences" due to students' educational experience, where $p = (0.89)$, (at $p < 0.05$), and the dimension "teaching, learning and the curriculum", where $p = (0.94)$, (at $p < 0.05$). In addition, the results showed that there were no statistical significant differences for the dimensions "assessment and evaluation", where $p = (0.97)$, (at $p < 0.05$) due to student's educational experience, and the dimension "productivity and professional Practice", where $p = (0.96)$, (at $p < 0.05$), and the dimension "social, ethical, legal, and human issues" where $p = (0.96)$, (at $p < 0.05$).

Discussion of results

The following section will demonstrate the ways in which the current findings both affirm and refute prior research.

Gender: The results showed no statistical significant differences in student teachers' estimates due to their gender in all the dimensions of the study except for the dimension "technology operations and concepts". According to this finding, it can be inferred that the gender of student teachers' did not differ with their estimates of the availability of educational technology standards and both males and females benefited of technology at the same level. The reason for this is due to the belief of all male and female teachers of the importance of international standards and its availability in their academic programs in the Faculty of Educational Sciences because of their importance to the life outcomes of the educational process.

Therefore, the researcher believes that many of the transactions and government services at the moment are electronically through the Internet and even Jordan is on its way toward becoming electronic management in all institutions for upgrading service and productivity. This in turn leads to availability and adequacy of dealing with networks and the Internet by students; where available they have the appropriate amount of culture and education which will enable them to access the digital world and reveal its secrets through Internet connection through the lines of Jordanians Telecom Companies regular and super DSL lines and other liable service providers. The status of females in Jordan is gaining momentum in technology where women are the ministers of telecommunication and information technology, industry and commerce, transportation, cultural affairs and social development.

It can be for training courses developed for teachers in the Ministry of Education, a clear impact in the absence of statistically significant differences to the degree of the availability of international standards due to gender. These results are similar to those found by (Alsharif-Mohammad, 2012; Alsharif-Nof, 2012; Elmas, 2013) which emphasize no differences in estimates due to gender for integrating technology into curriculum. Mathews and Guarino (2000), indicated that teachers' gender had an effect on teachers' computer use. In addition, Bani Domi (2010) found statistical significant differences in the degree of using the instructional technology competencies due to gender, in favor of females' teachers.

On the other hand, the emergence of statistical significant differences in gender in favor of female students for the dimension "technology operations and concepts" may be attributed to female great interest and tendency toward courses in academic programs and its applications which in return gave them experience and ability. In addition, the existence of these differences may be attributed to their participating in training courses which were fruitful in improving their teaching skills and exposing them to new trends and efforts to integrate technological concepts and operations. This is consistent with what Caleb (2000), points out that a female is more inclined toward communication and interpersonal interaction. This has essential inferences for gender-balanced issue selection in technology education. Shroyer, Backe, & Powell (1995) point toward social technologies may be more alluring to girls than the learning of industrial technologies.

Academic qualification: The results indicated no statistically significant differences in student teachers' estimates of the degree of the availability of international technological education standards. This was due to their academic qualification on all the dimensions of the study except for the dimensions "technology operations and concepts" and the dimension "Social, Ethical, Legal, and Human Issues" that were statistically significant and in favor of graduate students. This is consistent with modern trends in technology education, where the use of individual competitive projects is prevailing in undergraduate courses, while graduate courses are shifting toward more group collaborative projects. This is may be attributed to the researcher belief that most of students are having similar conditions in cultural, academic, and technological tools

experiences which contributed in bridging the gaps in their estimates regardless of their academic qualification. Existence of statistically significant differences in the above mentioned dimensions and in favor of graduates may be attributed to the fact that undergraduates have not been educated about related issues (Uysal, 2006).

Also, this differentiation may be attributed to the way graduates perceive themselves as holders of graduate degree which push them to welcome the tendencies and initiatives geared toward effective integration of international standards in a positive manner in order to enhance their education and knowledge. In addition, this is may be attributed to the fact that graduate students may had the chance to be part in training courses and educational sessions in their schools and universities that contributed to raising their theoretical and practical knowledge. This is in line with finding of a study by Kadijevich and Haapasalo (2008) that indicated the application types (theoretical or applied) of the courses on educational technologies are essential and distinctive factors that may yield this demarcation. In general, these results are similar to those found by (Lambert, Gong, & Cuper, 2008), and similar to Alsharif-Mohammad (2012), and Alsharif-Nof (2012), results that reveal no difference in estimates due to academic qualification for integrating educational technology.

Educational experience: The results showed that there were no statistically significant differences in all dimensions of the questionnaire due to student teachers' educational experience. This result of the study can be taken as important to progress in terms of making the integration of education technology for life-long learning. Therefore, digital gaps among experienced teachers and student teachers no longer exist. This may be attributed to the similarity of educational experiences in general for students in the city of Amman.

The similarity of patterns of thinking and working conditions, and the similarity in local environments where they grew up may result in a lack of statistically significant differences between student teachers' estimates of the degree of availability of international standards in the Faculty of Educational Sciences. Also, the researcher believes that enrollment in similar teacher training courses resulted in close qualification rates which may have contributed in the lack of differences in students estimates, where these training courses helped students to develop their expertise and provide them with new and advance trends in utilizing technology in education.

In addition, students activity, creativity, and desire to exert more effort to use and employ technology due to their awareness of its importance in achieving the objectives of the teaching process as well as the awareness that excluding of technology in teaching leads to insularity in the minds of students. The researcher believes that the great motivation of students, regardless of their expertise, is a distinctive factor in the absence of differences in their estimates especially since the reward system for teachers play a role in reducing the impact of experience in making a difference in their estimates about employment barriers of technology.

These results are similar to those found by Alsharif-Nof (2012) which showed no differences in estimates due to educational experience for integrating technology into science curriculum. While (Mathews & Guarino, 2000; Inan & Lowther, 2010; & Bani Domi, 2010) indicated that years of teaching experience had an effect on teachers' Technology use. In addition (Bebell, Russell, & O'Dwyer, 2004; Ertmer 2005; Ross, Hogaboam-Gray & Hannay,1999; Shiue 2007) reported that, the more experienced teachers tended to utilize technology regularly.

Recommendations

Based on the findings of this study, the researcher recommended emphasizing the importance of the availability of international technology education standards in all areas, with a focus on the dimensions marked with significant differences between male and female student teachers such as "Technology operations and concepts", and significant differences between graduate and

undergraduate student teachers on dimensions such as “Technology operations and concepts” and “Social, ethical, legal, and human issues”. Additional research will be required to better understand these differences.

Conclusion

In conclusion, it could be argued that diverse projects, often targeting female education disparities, have widely altered gender stereotypes in education over the last 20 years in Jordan. It is obvious that gender roles have changed over time. With regard to the role of academic qualification in the use of international technology education standards, it appears that the university's practices and environment are similar for both undergraduate and graduate students. As for the educational experience and its role in the use of international technology education standards, we must distinguish between the educational experience of student teachers involving the use of educational technology, and educational experience that does not include the use of educational technology. Additionally, there is a great deal of efforts is required to integrate international technology education standards and apply curriculum designed into academic programs to edify to such standards. To effectively prepare our student teachers, a future agenda tackling obstacles that may hinder the integration of these standards must be researched and implemented to wisely incorporate these standards. This research may shed light on the kind of expected support needed by education policy makers.

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Editor's Note: This study examines a variety of factors that influence the adoption and effectiveness of a rowing distance learning program. Although the results are specific to the South Pacific region, the research design could be applicable to any regional distance learning program.

Investigating critical factors for adoption of e-learning in the South Pacific region

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Fiji

Abstract

This paper investigates the factors that facilitate or limit the adoption of e-learning in a leading institution of the South Pacific region. Three conjectural perspectives (Technology Acceptance Model, Resource-based Theory and Institutional Theory) were employed and the findings of the study indicate that all of the independent variables (derived from the Resource-based view) are prominent; however, only organizational factors and finance made a positive and significant difference in explaining e-learning diffusion/adoption. Technology and human resources were negative and significant, whilst training and content could not explain e-learning diffusion/adoption. These were attributed to the academics' limited apprehension related to awareness, commitment to use, methodical expertise, and time expected to accomplish e-learning initiatives, which were competing priorities of academics in the Pacific. Perceived usefulness and perceived ease of use negatively impacted academics' behavioral intentions. Implications of the conjectural underpinnings were outlined.

Keywords: ICT, e-Learning, e-Readiness, diffusion/adoption, USP, South Pacific Region.

Introduction

E-learning is the "use of information and communication technologies (ICTs) to enhance and/or support learning in higher education (HE)" (OECD 2005, 11). It is a contemporary shift in HE towards designing and implementing e-learning platforms that afford learners virtual access and education content online. The antecedents of this trend are technological developments, transformations in innovation, the growing diversity of students worldwide, and changes in the education delivery market (Concannon et al. 2005; Keramati et al. 2011). The manner in which knowledge is generated and authenticated is shifting. Today's tech-based economy, coupled with changing market needs, poses unique challenges which universities are trying to address.

On one hand, the cohort of students currently flowing into higher education institutions (HEIs) and their profound interest in consuming technological resources is necessitating the diffusion and usage of technology in teaching and learning (T&L), both inside and outside the classroom (De George-Walker and Keeffe 2010). The Asian Development Bank (2008) is also emphasizing the necessity to increase access to education through the development of more online programs. The bank has stated that online learning could be a valuable tool for all South Pacific students (Asian Development Bank 2008). There therefore appears to be a two-fold argument stressing both the bottom-up and the top-down drivers for change in HEIs. HEIs are consequently trying to deliver effective, flexible, useful and accessible learning experiences (Lee et al. 2009).

However, the successful roll-out of e-learning in HEIs poses many challenges. The rise of innovative academies that are explicit providers of distance learning, as well as virtual institutions, has shifted preferences from antiquated educational environments towards transformed innovative academies (Bates 2000). HEIs are therefore compelled to motivate academics to use and promote ICTs in T&L, which can be a considerable challenge (Mackeogh and Fox, 2009). Infrastructure, faculty effort, technology consumption, IT proficiency (Surry et

al. 2005) and the absence of any sort of business strategy are other factors impeding the expansion of e-learning (Elloumi 2004). Academics have been found to have a number of additional apprehensions, such as resilient loyalty to traditional T&L models, cynicism about the success of e-learning initiatives, and other issues concerning job load, forfeiture of control, and maintaining standards. Concerns regarding the execution of such digital resources pose cultural, contextual and curricular barriers precluding the exchange of subject-specific resources (Christiansen and Anderson 2004; Whitworth 2005).

Investigating e-learning readiness could have a significant impact on the successful diffusion/ adoption of e-learning initiatives. It could also enhance understanding regarding how educational institutions themselves perceive e-learning and show whether perceived usefulness and perceived ease of use have a significant impact on behavioral intention. Tertiary institutions in this regard have taken full advantage of ICT to support their work. E-learning is seen as a necessity in today's knowledge economy (USP Strategic Plan 2013-2018). Tertiary institutions in Fiji have made some progress in implementing e-learning. In 2001, they began using WebCT – a learning management system (LMS) which was its principal system until 2006. From 2007 onwards, some institutions have been using the LMS popularly known as Moodle (Yusuf 2011). ICTs have mainly been used to transform the educational milieu at universities in Fiji (Raturi et al. 2011) but the issue has mostly been attributed to students' proficiency in e-learning which has been a daunting issue (Raturi et al. 2015). Other authors such as Whelan (2008) observed that training and capacity building, curriculum development, infrastructure, finance, renewed policy initiatives and top-down government support have been imperatives for ICT in education. Numerous scholars deliberating "e-learning or ICT for the Pacific" have debated the essentials of integrating technology and training into HE (Nabobo-Baba 2002; Whelan 2007) to enable accessibility.

Regardless of the progress that has been made in e-learning, there is mounting apprehension pertaining to its diffusion/adoption in universities. Gauging academics' views and intentions, and understanding the dynamics at play behind their criticisms of e-learning can help an institution's administration to construct viable mechanisms to promote adoption of e-learning. Minimal research has been done in the South Pacific context to empirically determine the correlation between academics' diffusion/adoption of e-learning and factors such as perceived usefulness and perceived ease of use (Cho and Kim 2001; Parthasarathy and Bhattacherjee 1998), technology, content and training (Darab and Montazer 2011; Rovai and Childress 2002; Venkatash and Bala 2008), organizational factors (Nysveen et al. 2005), human resources and finances (Chatterjee et al. 2002; Liang et al. 2007), which have all been confirmed to be significant stimulating variables that affect users' behavioral intentions regarding the adoption of a new system. This study therefore seeks to examine these variables primarily based on the Technology Acceptance Model (TAM), Resource-Based Theory and Institutional Theory to fill the gap in the research.

Conceptual underpinnings and literature review

The concept of e-learning diffusion/adoption in this study relates to how the benefits of e-learning are communicated via the social processes that impact the academics' judgment to utilise e-learning systems (Forlani and Parthasarathy 2003; Deffuant et al. 2005; Hafeez et al. 2006; Rogers, 2003). Diffusion denotes the processes and mechanisms employed by HEIs to intensify e-learning adoption. In the current study, adoption is primarily concerned with the dynamics inducing acceptance of e-learning.

According to scholars, diffusion/adoption enquiries must be advanced by comprehending the institutional and individual factors that stimulate adoption (de Freitas and Oliver, 2005; Rogers, 2003). From a conjectural perspective, there is a shift from solely investigating any one phenomenon that impacts e-learning diffusion/adoption towards examining the interfaces amid the individual and structural by undertaking an interactive view (Birch and Burnett 2009; Eynon

2005). Three perspectives: TAM, Resource-based Theory and Institutional Theory serve as the conjectural underpinnings in this study.

TAM was advocated by Davis (1989) and is established upon the notion that a person's behavioral intention (BI) of favorable response and their usage of a specific technology is regulated by two constructs: perceived usefulness (PU) and perceived ease of use (PEOU). This is a prominent model that has been used to comprehend ICT diffusion/adoption (Gefen and Straub 2000), employed extensively by scholars (Kim and Chang 2007; Ma and Liu 2004; Moon and Kim 2001), substantiated for its vigor (Sumak et al. 2011) and supported by experiential enquiries (Venkatesh et al. 2003, 2007). Various studies have speculated that the TAM is apposite for diverse situations and is a universal model (Cheung and Huang 2005; Drennan et al. 2005; Liaw and Huang 2003). Some critics of this model posit that it discounts non-organizational backgrounds (Venkatesh and Davis 2000) and ignores the moderating impact on adoption and use in diverse situations (Sun and Zhang 2006). Baker et al. (2010) identify that the TAM in two diverse cultural settings could yield dissimilar outcomes. The TAM model has been employed in the study due to its ease of application/understanding. This model has been used extensively to elucidate tech-adoption in HEIs (Baker-Eveleth et al. 2006; Min et al. 2004; Walker and Johnson 2008). The TAM model significantly accounts for an explanatory power of 40 to 50 percent (Venkatesh and Davis 2000). Though the TAM model focuses on the individual factors only, studies highlight that it can be employed as a valuable conjectural base to envisage and apprehend diffusion/adoption of e-learning (Lee et al. 2005). Consequently, scholarly studies exploring feasibilities of the TAM model in the Pacific educational context are scanty.

The TAM model is based on two constructs – perceived usefulness (PU) and perceived ease of use (PEOU) which are fundamental in understanding the diffusion/adoption of e-learning. PU is defined as the extent to which a person considers that employing a certain technology will augment their and the organization's work performance (Davis et al. 1989). Substantial studies in various educational fields (e.g. Cheong and Park 2005; Koufaris 2002; Legris et al. 2003; Ong and Lai 2006) have deliberated on the role of PU and its impact on tech acceptance.

PEU denotes the extent to which a person considers that employing a certain technology will be free of effort (Davis et al. 1989). It is conceivable that whilst technology may be pragmatic, it can also be challenging, and users may weigh up the benefits of usage against the efforts required (Davis 1989). Many studies believe that PEU has a significant impact on tech acceptance (Amin 2009; Elliott and Fu 2008; Porter and Donthu 2006; Venkatesh 2000; Venkatesh and Morris 2000; Wang et al. 2003).

The TAM model precisely emphases on computer usage behaviour (Davies 1989; Davies et al. 1989) and at the micro-level, academics' perceptions on e-learning diffusion/adoption are pivotal (Birch and Burnett 2009). However, e-learning or online learning could also be envisaged as a modality, which is an emerging area of research (Halverson et al. 2014). With increased research emphases shifting towards understanding e-learning modalities, the key challenge for academics lies in embracing the different modes, face-to-face and online learning modalities, towards acclimatizing blended teaching which is becoming a permeating feature in HE (He et al. 2014). Under the e-learning domain, it could also be viewed as a didactic model of the future (Porter et al. 2014) supporting active engagement (Lopez-Perez et al. 2013). Thus, given the parameters of the TAM model in examining the environmental and structural factors that could impact academics' transference from one modality to the other, against the backdrop that academics' need various resources and capabilities to strategize course delivery (Ben-Jacob et al. 2000; Jones et al. 2008; Lee and Busch 2005; Marfoglio 2006), the Resource-based Theory becomes pertinent.

The Resource-based (RB) theory (Barney, 1991) offers the conjectural underpinnings to explore the antecedents that affect e-learning diffusion/adoption. This theory advocates that organizational resources (macro-level variables) that are expensive or hard to emulate help organizations attain competitive advantage. The first viewpoint of the RB theory speculates that the practical capabilities of IS could serve as a source of competitive advantage (Bharadwaj 2000), whilst the second viewpoint dictates on how the resources are availed and exploited to sustain competitive advantage (Ravichandran and Lertwongsatien 2005). Nonetheless, both perspectives agree that resource readiness regulates IS capabilities and additionally impacts performance (Ray et al. 2005). The RB theory fits in well and offers reflective attention on how organisational resources are pooled and deployed (Peteraf, 1993) to examine how HEIs strategize to ensure successful e-learning diffusion/adoption. As per the theory, organisations are categorized as stocks of resources packaged into capabilities and competencies. This theory is apposite for the study and suggests that it is requisite for organizations to acquire capabilities and competencies to enter new areas (Duysters et al. 2000).

Technology is an essential requirement for e-learning diffusion/adoption. HEIs are answerable for affording sufficient physical facilities (i.e: resources) which have had a fundamental influence on the efficacy of steering unremitting professional development for e-learning in HEIs (Rogers, 2003). In order to facilitate e-learning diffusion/adoption, HEIs must provide adequate and reliable technical infrastructure in the form of organizational resources (Brush et al. 2003; Piccoli et al. 2001; Rhee et al. 2007; Sun et al. 2008; Williams and Eyo 2011).

The second organizational resource is training which encompasses computer literacy, online training or technical skills provided by HEIs to academics (Aydin and Tasci 2005). E-learning diffusion/adoption is also reliant on the e-ability as well as the accessibility of e-learning technologies (Aydin and Tasci 2005; Al-Senaidi et al. 2009). E-learning knowledge, skills, and experiences are therefore imperative for e-learning acceptance and implementation (Bonk et al. 2002; Sadik 2007). Without these elements, anxiety can create reluctance in diffusion/adoption (Fuller et al. 2006; Venkatesh 2000).

Organizational factors are also desirable and at the institutional level, HEIs that are new to e-learning, need to define the concept to ensure common understanding amongst academics, and clarify the institution's agenda and inclination towards such a T&L mode (Fathian et al. 2008). Faculty members will lack motivation to pursue e-learning in the absence of genuine institutional encouragement and support. Organizational culture plays a pivotal role, therefore, making an e-learning system obligatory within the didactic setting would not necessarily bring about usage (Chatterjee et al. 2002; Liang et al. 2007; Pituch and Lee 2006), and without top management support and leadership, e-learning will fail (Soong et al. 2001; Venkatesh et al. 2003; Venkatesh and Bala 2008). Therefore, organizational/top management support and leadership, institutions agenda and encouragement are predominant resources (organizational factors) availed by HEIs.

Another pivotal resource are people (Human resources), and correspondingly lack of awareness and tech-savvy HR, limits e-learning diffusion/adoption (Aydin and Tasci 2005). Subsequently, the enthusiasm of teaching and support staff is prudent (Alavi and Leidner 2001; Chen and Jang 2010; Johnson et al. 2008; Piccoli et al. 2001; Sun et al. 2008).

Content is another essential variable cited by scholars and is regarded as an internal factor or resource (Darab and Montazer 2011; Rovai and Childress 2002; Venkatash and Bala 2008). It is established that for the fruitful delivery of e-learning, courses and programs ought to be well designed by academics' (Piccoli et al. 2001; Sun et al. 2008). While e-learning requires academics' to design learning resources that encourage students to think critically, actively, and deeply, there is a need to train faculty members in how to use e-learning development software,

manage e-courses, integrate web resources, and interact with students online (Sadik 2007). Therefore, this is also an important organizational resource.

E-learning likewise relies on resources in the form of financial support, which are central for digital infrastructure, computers, internet penetration, and connection costs (Aydain and Tasci 2005; Reiser 2001). Therefore financial resources are warranted (Chatterjee et al. 2002; Liang et al. 2007; Hamel and Valikangas 2003). This has implications on how well financial resources can be deployed in terms of achieving innovation and where to intensify e-learning progress or vice versa (Richards et al. 2004).

For the assessment of e-learning diffusion/adoption, institutional theory is also apposite. Lewis et al. (2003) offer a theoretical supposition and present arguments on the role of the social milieu, within which the individual is positioned, as well as the institutional forces surrounding the individual. Leender (2002) makes a significant contribution to this field in his discussion on the theory of social contagion, asserting that individuals' beliefs, attitudes, and behavioral resemblances are induced by social actors; thus, adaptation is more likely to occur in a network with which they are allied (Leender 2002; Scott 2001). Scott regards institutions as social structures that have achieved a high level of resilience (Scott 2001) and elucidates that institutions once established, serve as imposing guidelines for social behaviors (Scott 2004). This implies that structures and processes become entrenched within as the 'the way things are done' or 'taken for granted' (Scott 1987). The prominence of 'taken for granted' infers acquiring legitimacy (DiMaggio and Powell 1983; Harcourt et al. 2005). The institutional theory has been predominantly pragmatic at the organizational level (Liang et al. 2007) and has therefore been deployed in this study. Prior scholarship admits that the selection of organizational and management best-practices are induced by isomorphism (Di Maggio and Powell 1983). This is a source of political power and legitimacy (DiMaggio and Powell 1983; Scott, 1987, 2001, 2004).

The three mechanisms by which institutional vicissitudes occur that endorse resemblances in structures and processes are coercive, mimetic and normative pressures (DiMaggio and Powell 1983; Liang et al. 2007; Scott 2001; Teo et al. 2003). Scholars discourse on the noteworthy recognition of institutional forces as significant antecedents of the diffusion/adoption of IS products/practices (Liang et al. 2007; Orlikowski et al. 2001; Teo et al. 2003; Tingling et al. 2002).

DiMaggio and Powell (1983) elucidate that coercive pressures, formal and informal pressures are exerted by influential actors on the social actors to adopt similar attitudes, behaviors and practices and may stem from a variability of sources: example, unions, students, regulatory agencies, suppliers, and other key stakeholders such as funders (Teo et al. 2003). Overall, two types of coercive pressures prevail: regulatory pressures arising from the Government or regulatory agencies (Harcourt et al. 2005; Zhu et al. 2004) and competitive pressures arising from the risk of losing competitive advantage (Harcourt et al. 2005).

Mimetic pressures are elucidated as voluntary and cognizant emulation of efficacious organisations or high-status actors due to their competitive proficiencies, technological know-how or belief by social actors that imitation will yield positive outcomes (DiMaggio and Powell 1983; Haberberg and Binsardi 2002) and can vintage first-mover advantage (Teo et al. 2003).

Normative pressures narrate to professional staff from disciplines that are answerable for decisions on e-learning and explain voluntary and unconscious emulation. The managers' decisions pertaining to e-learning are susceptible to the community of professionals that harvest either mutual learning or are part of similar social networks (Haberberg and Binsardi 2002). Social actors may also be inclined to adopt specific behaviors given their anticipation of legitimacy and not essentially for aptness (Johnson et al. 2006). Nevertheless, it should be illuminated that emulation is not forced by any influential actors, nor is it conscious. Rather,

gradually actors in similar networks become sincere that it is the regular and solitary approach of doing things (Harcourt et al. 2005; Johnson et al. 2006), hence social actors disinclined to adopt an innovation may experience dissonance and later anxiety when interacting with social networks (DiMaggio and Powell, 1983; Van Den Bulte and Lilien 2001).

Objectives

This study recommends an integrated conjectural framework incorporating academics' e-learning reception and intention to use, constructed primarily on the Technology Acceptance Model (TAM), Resource-based Theory and Institutional theory. The purpose of the study is to ascertain and scrutinize the factors that facilitate or limit the diffusion/adoption of e-learning.

Research hypotheses

In accord with the specified objectives and consistent with the literature reviewed, this study tested the following hypotheses:

H1: Technology influences academics' diffusion/adoption of e-learning.

H2: Training influences academics' diffusion/adoption of e-learning.

H3: Organizational factors influence academics' diffusion/adoption of e-learning.

H4: Human resource influences academics' diffusion/adoption of e-learning.

H5: Content influences academics' diffusion/adoption of e-learning.

H6: Finances influence academics' diffusion/adoption of e-learning.

H7: Perceived usefulness influences academics' diffusion/adoption of e-learning.

H8: Perceived ease of use influences academics' diffusion/adoption of e-learning.

H9: Higher levels of coercive pressures influence academics' diffusion/adoption of e-learning.

H10: Higher levels of mimetic pressures influence academics' diffusion/adoption of e-learning.

H11: Higher levels of normative pressures influence academics' diffusion/adoption of e-learning.

Research design

Based on previous studies, a conjectural model was developed. Figure 1 presents a hypothetical model to be examined and confirmed.

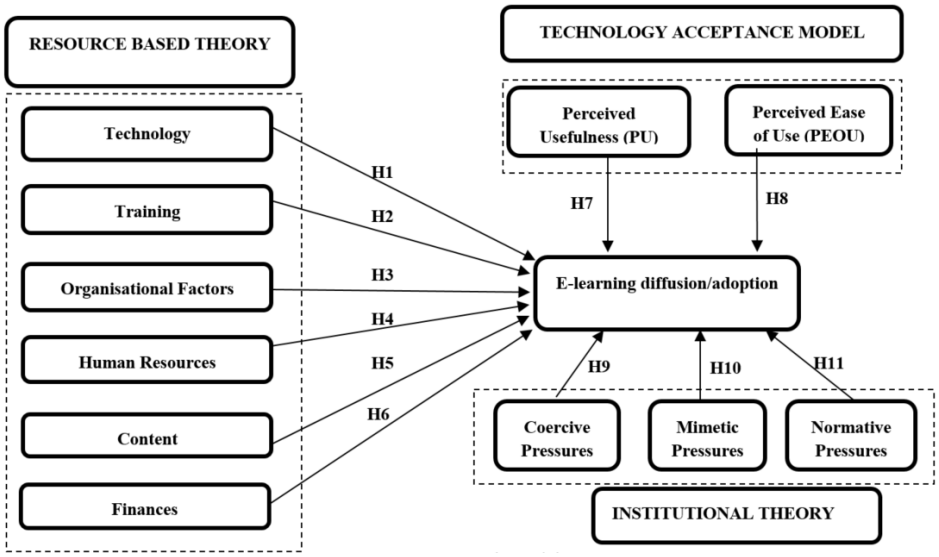

Figure 1. Research Model

Methodology

Participants

A total of 438 academics were employed in the University of the South Pacific's regional HE institution at the time of writing. Bartlett et al. (2001) was drawn on in order to establish a suitable sample size. At a confidence level of 95% and a confidence interval of 0.05, the sample size of 438 was deemed appropriate via random sampling. Only 400 academics responded to our invitation to participate in the study, giving a 91.3% response rate. From this 400, only 309 responses were fit for analysis.

Instrumentation

The researchers employed various modes of data collection, ranging from structured self-administered questionnaires to using courier and email services. The validity of the content was proven via pilot testing the instrument on a random sample of 20 participants, which were not included in the survey as the questions were subsequently modified slightly for ease of understanding. The questionnaire consists of eight sections. Existing studies were drawn in designing questions to tap variables under the Resource-based theory: technology, content and training from the work of (Darab and Montazer 2011; Rovai and Childress 2002; Venkatash and Bala 2008), organizational factors from (Nysveen et al. 2005), human resources and finances from (Chatterjee et al. 2002; Liang et al. 2007) which were assessed on a five-point Likert scale. To measure perceived usefulness and perceived ease of use, five-point Likert scale was used and the work of Davis (1989) and Moore and Benbasat (1991) were adapted. Cronbach's alpha was used to evaluate the internal consistency of the items. Table 1 illustrates the reliability assessments.

Table 1
Summary of reliability analysis

Variables	Cronbach's α
Technology	0.80
Training	0.90
Organizational factors	0.88
Human Resources	0.98
Content	0.89
Finances	0.71
Perceived Usefulness (PU)	0.94
Perceived Ease of Use (PEOU)	0.75
Coercive Pressures	0.65
Mimetic Pressures	0.72
Normative Pressures	0.69
E-learning diffusion/adoption	0.78

Procedures

The researchers solicited voluntary consent from the survey participants within the various campuses; those that gave their voluntary consent were given the questionnaire to complete. Multiple methods of data collection were employed to control non-response errors. All the survey participants were informed about the purpose of the study and were made aware of their right to withdraw from the study at any time.

Statistical procedure

Data collected via questionnaires were coded by the researchers and entered into the Statistical Package for the Social Sciences (SPSS). The data were verified for coding precision. Descriptive statistical analyses such as frequencies and correlation were executed via SPSS and path analysis was executed using WarpPLS software.

Ethical considerations

The study commenced, having obtained ethical approval. The procedures were meticulously followed in order to ensure that all of the survey participants gave informed consent and that their privacy was protected throughout the research process and in any statistics subsequently published.

Respondents' profile

From the representative sample of 309, around 48.5% were middle-level academics (professors, associate professors, senior lecturers, lecturers); the remaining 51.5% were teaching support staff. In terms of education, 40% had the top qualification (PhD) or a Masters (9%). The rest were almost equally divided between Postgraduate (34%) and Bachelor's degrees (17%). In gender distribution, 47% of the sample were female and 53% were male. Analyzing the age distribution, 30% of the staff respondents were between 26-30 years, followed by 22% in age group 31-40 years, 32% greater than 41 years, and a small fraction (16%) between 21-25 years of age.

Results and discussion

The objective of the study was to ascertain and scrutinize the factors that facilitate or limit the diffusion/adoption of e-learning. Mean values were computed for the factors under the Resource-based theory. In Table 2, the results show that for all of the variables where the mean values are > 2.0 and < 2.5, the academics' are in "agreement" that these factors are essential for the diffusion/adoption of e-learning. Under TAM, Perceived usefulness and ease of use also had mean values of > 2.0 and < 2.5. For the institutional forces, mean values indicate that coercive pressures, mimetic and normative pressures are all high (mean value >2.0).

Table 2
Summary of the factors impacting e-learning diffusion/adoption

Variables (Resources)	Mean Value	Interpretation
Technology	2.50	Neutral
Training	2.06	Agreement is high on its importance
Organizational factors	2.17	Agreement is high on its importance
Human Resource	2.33	Agreement is high on its importance
Content	1.91	Agreement is high on its importance
Finances	2.39	Agreement is high on its importance
Perceived Usefulness	2.20	Agreement is high on its importance
Perceived Ease of Use	2.31	Agreement is high on its importance
Coercive Pressures	1.89	Agreement is high on its importance
Mimetic Pressures	2.59	Agreement is high on its importance
Normative Pressures	3.73	Agreement is high on its importance

Hypotheses testing

Correlation analysis was conducted to test the relationship between the variables (classified as resources) under the Resource-based theory with e-learning diffusion/adoption. Significance levels of 1%, 5% and 10% were all considered as a basis for accepting or rejecting the hypotheses. Correlation analysis was conducted to test Hypotheses 1 to 6. In Table 3, the results show that the independent variables of the Resource-based theory can explain e-learning diffusion/adoption.

Table 3
Internal organizational resources impacting e-learning diffusion/adoption

Variables	E-learning diffusion/adoption	Interpretation
Technology	(β = -0.415, p = 0.000 < α 0.01, 0.05 and 0.10)	Negative and Significant at 1%, 5% and 10%
Training	(β = 0.330, p = 0.515 > α 0.01, 0.05 and 0.10)	Positive and Insignificant at 1%, 5% and 10%
Organizational	(β = 0.447, p = 0.000 < α 0.01, 0.05 and 0.10)	Positive and Significant at 1%, 5% and 10%
Human Resource Readiness	(β = -0.293, p = 0.003 < α 0.01, 0.05 and 0.10)	Negative and Significant at 1%, 5% and 10%
Content	(β = 0.292, p = 0.42 > α 0.01, 0.05 and 0.10)	Positive and Insignificant at 1%, 5% and 10%
Finances	(β = 0.312, p = 0.002 < α 0.01, 0.05 and 0.10)	Positive and Significant at 1%, 5% and 10%

This study examined the relationships between various resources (technology, training, organizational factors, HR, training and finances) and e-learning diffusion/adoption. The results pinpoint that HR (people) and technology negatively correlated to e-learning diffusion/adoption but significant, whilst the contribution of training and content are positively correlated but insignificant. Organizational factors and finances influenced e-learning diffusion/adoption and significantly contributed in the study. Thus H1, H3, H4 and H6 are accepted in the study whilst H2 and H5 are rejected.

Despite the extensive use of e-learning in academia, the results of the study suggest that it has not yet reached its full potential in the Pacific region. A number of issues were identified as bottlenecks in realizing e-learning diffusion/adoption. This has implications from the Resource-based perspective. Academics from the various campuses have reflected that explicit goals/motivations for consuming e-learning have been deficient at the institutional level. In terms of technological resources (H1), the negative association infers that structural aspects subsequently impacted academics' diffusion/adoption of e-learning and their ability to participate principally, given the technical (poor bandwidth) and infrastructural issues in the island nations. The training resource (H2) showed a positive association although did not yield any significant differences; HR (H4) had a negative association with e-learning diffusion/adoption. The contextual variables, such as pedagogical support, the expertise and reactions of academics to using e-learning platforms, and the fact that many academics admitted "atychiphobia" – a persistent fear of failure attribute to the results. In terms of content (H5), which was rejected in the study, the predominant issue was course structure (how the course was designed and delivered through the e-learning platform). This posed problems as the academics couldn't engage particularly well with their students due to a lack of understanding, access issues in the islands, or issues pertaining to structure where the online environment was too difficult to grapple with. This could be a prominent problem for students in the Pacific as well given their varying cultural and linguistic backgrounds. Therefore, the proficiency of academics must be taken into account regarding the uptake of e-learning platforms. Supplementary problems – such as awareness of e-learning, commitment to using e-learning, and methodical expertise in using e-learning – received medium attention. There were few issues that precisely rose, i.e. the time expected to be spent on accomplishing e-learning initiatives was far greater than in the traditional approach, and some

lecturers were afraid of workload issues, given competing priorities of academia. The academics interviewed stated that training should be tailored to different levels of aptitude in different disciplines. Apprehension pertaining to ICT infrastructure to sustain e-learning – such as connectivity issues and technical support at the local campuses – has also received attention in the study.

The results show that organizational factors (H3) and finances (H6) are highly significant. However, the academics interviewed stated that good sharing practices within the campuses were scarce, despite change management being promoted. In this regard, Shoham and Perry (2009) become pertinent, where they deliberate on the role of knowledge management in managing change efforts. Furthermore, they agree that the effect of intellectual property rights on the consumption of e-learning is an issue, whilst the level of organizational support at the school level is extremely misplaced. Undoubtedly, the execution and acceptance of e-learning has wide implications on academic systems, practices and resources. The issue of digital content not being in line with course requirements shows that incongruities might further impede the objectives of e-learning. Connectivity in the PICs is extremely poor with inadequate bandwidth, which causes considerable lag. Thune and Welle-Strand (2005) state that the modes of ICT used by an organization are pivotal for sustained success.

Drawing on TAM, Path analysis was used to test the relationship amid e-learning diffusion/adoption, with PEOU and PU variables as direct effects. Significance levels of 1%, 5% and 10% were all considered as a basis on which to accept or reject the hypotheses.

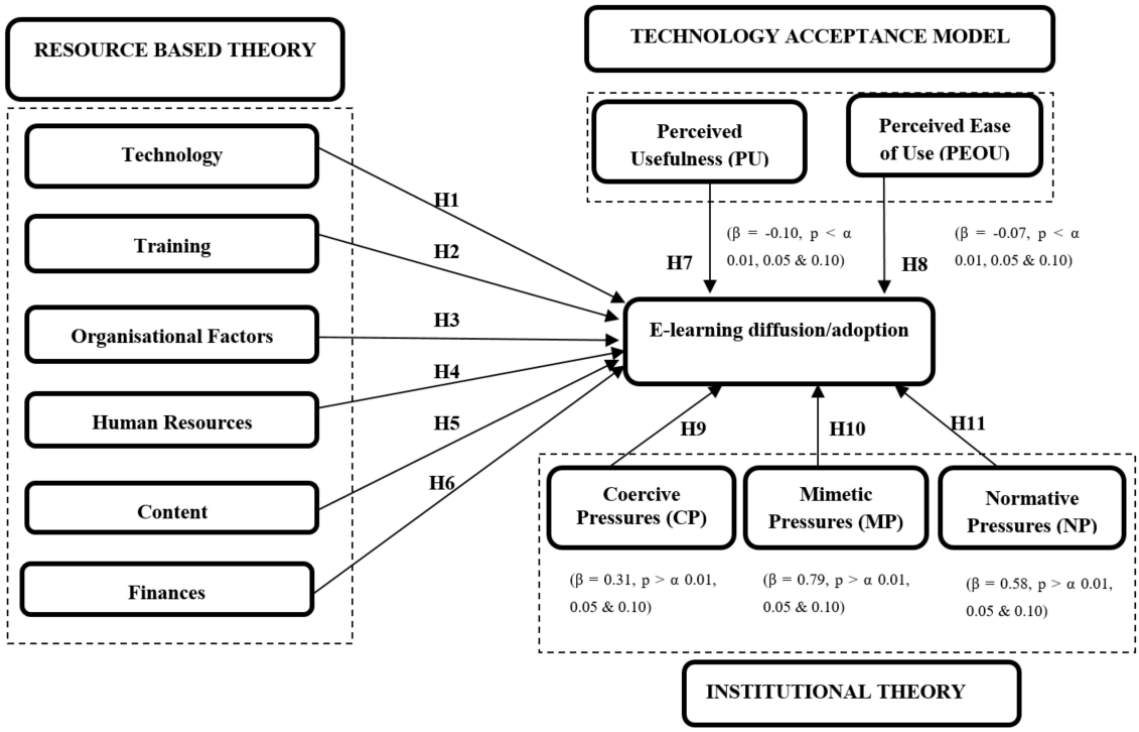

Figure 2. Direct effects of TAM (PEOU and PU) and institutional forces (CP, MP and NP) on e-learning diffusion/adoption

In Figure 2, results indicate that PU and PEOU have negative direct effects. This suggests that academics' anxiety and disinclination to adopt e-learning are emotional responses. This research also concludes that academics who had negative views concerning the perceived benefits of the adoption/diffusion of e-learning failed to adopt new systems. For this purpose, there is potential

for concrete improvement and administration of e-learning within the university. Trainers should enhance university academics' e-learning efficacy. This implies, improving academics' skills with e-learning software, and also improving their attitudes and making them more proactive. E-learning diffusion/adoption also needs to be considered and understood within the local context. This has implications for training and content which are also organizational resources and the findings align to that.

From an institutional theory perspective, the significance of the path coefficients from coercive pressures to diffusion/adoption ($b = 0.31$, $p > 0.01$, 0.05 and 0.10), mimetic pressures to diffusion/adoption ($b = 0.79$, $p > 0.01$, 0.05 and 0.10) & from normative pressures to diffusion/adoption ($b = 0.58$, $p > 0.01$, 0.05 and 0.10) refuted support for H9, H10 and H11 (see figure 2). These verdicts endorse the conjectural propositions that higher levels of these institutional forces (as Beta values are positive) can impact e-learning diffusion/adoption. This also aligns to the fact that organizational factors (under the Resource-based theory) could be a contributing factor. However, it is insignificant in explaining its strength given that tech, HR. content and training have been impending factors affecting diffusion/adoption. From an institutional theory perspective, the outcomes of the study show some administrative implications for trainers in human resources, IT and the curriculum design/development team. Trainers within the university (in-house) and consultants could create e-learning communities within the university which would facilitate greater knowledge sharing. Large-scale, quick adopters of e-learning are advised to act as champions for slow adopters within campuses. Learners should also be categorized in accordance with their varying learning competencies to ensure that they receive appropriate training and development programs. In terms of diffusion/adoption, the institution must show credible validating evidence of the success of e-learning models so that the majority of its academics accept the e-learning platforms and are better able to see the benefits. Discipline and local contextualization are pivotal at the institutional level as well to ensure that an authentic experience is delivered.

Conclusions and implications

E-learning has gained momentum and prominence in HEIs and is seen as a novel notion in the Pacific. Nonetheless, this study has shown that key organizational resources determine successful e-learning diffusion/adoption. The study acknowledges the perceived benefits of e-learning as well as academics' apprehensions concerning their ability and the ease of use of e-learning platforms. As employment of e-learning is still in its infancy in the Pacific, the researchers anticipate that the results of this study will prompt due consideration of the difficulty/ease of use of e-learning initiatives, and facilitate successful diffusion/adoption through a number of key factors. These include strategic leadership and management, well-articulated institutional e-learning objectives and their associated repercussions, a supportive organizational culture, tailor-made support for scholars, appropriate infrastructure to support e-learning to address the issue of accessibility, and e-learning training.

This study highlights the need to judiciously examine the state of an organization's infrastructure and resource availability prior to the diffusion/adoption of e-learning. This study marks notable implications for scholars and practitioners. It pinpoints the need for HEIs to develop HR (people resources) via training, and also pronounces the need for social support for innovative practices. One of the key requisites would be to capitalize on resources and accordingly grander competences to upsurge diffusion/adoption. For scholars, investigating diffusion/adoption of e-learning, this study marks the significance and relevance of the RB theory for enabling/disabling diffusion/adoption. For practitioners, the insinuations pertain to the prominence of ascertaining the influential resources and capabilities inducing diffusion/adoption in HEIs. It is envisaged that the study will inspire scholars to further scrutinize the influences of differing resources on

diffusion/adoption and that future research combines the factors of the external environment, as well as the demographic and cultural elements to further expand the research model.

Another significant contribution of the study is that without requisite organizational resources, and institutional interventions to augment e-learning diffusion/adoption, e-learning presents no real-world usefulness. Little empirical literature has undertaken such an investigation in such a geographically small area. This study should not be taken to exemplify the entire scenario of e-learning within HEIs in the Pacific, as it only takes into consideration one institution of the South Pacific. However, this institution is present in 12 Pacific countries. Nonetheless, this study delivers rigorous insights into e-learning diffusion/adoption among academics from the University of the South Pacific. It is hoped that this preliminary study might encourage further research via longitudinal and cross-comparative investigation, as studies in this topic regarding the Pacific are scarce, and this is a new emerging field of enquiry.

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Editor's Note: A valuable pilot study to get the ball rolling for special education teachers and students. This has the potential to make significant contributions for learning in the classroom and to be available to support learning anywhere and anytime.

Preparing special educators to use mobile technology in instruction

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USA

Abstract

Mobile technology offers many unique advantages to traditional instructional methods and has great potential to positively impact learning for all students in the K-12 setting and higher education. Increasing the frequency of mobile technology use in instruction with students with disabilities is critical to student success. This study sought to determine the impact mobile technology instruction had on teachers' beliefs about the value of potential uses of mobile technology for students with disabilities and also sought to predict frequency of mobile technology use in the classroom instruction of individuals' who took a graduate level course in special education. Thirty-two participants in an online graduate course responded to a mobile technology survey prior to participating in any course activities and at the end of the course. Since data could not be used to determine the impact of training, separate predictive analyses were conducted in an attempt to isolate predictors of technology use in instruction. Results indicated that special education teachers were not using technology daily and were therefore not exposing their students to potentially beneficial methods of instruction. Additionally, factors such as self-efficacy were predictive of daily technology use. Implications and suggestions for future research are provided.

Keywords: special education, teacher preparation, online instruction, mobile technology, regression analysis, beliefs, self-efficacy, instructional technology, in-service teachers, technology integration.

Preparing special educators to use mobile technology

Students in our present-day classrooms are being educated, largely, for jobs that have not yet been conceptualized (Ertmer, 1999; Schrum & Glasset, 2006). Technology is being created at a pace never witnessed and it is growing more efficient and ubiquitous with each day. As schools face the challenge of meeting diverse student needs with limited resources, mobile technology has been posed as a promising solution. Mobile technology offers many unique advantages to traditional instructional styles including broad accessibility, individualization for diverse student needs, and engaging/interactive material (Johnson, Adams Becker, Estrada, & Freeman, 2015; Robledo, 2012). Additionally, because educational experiences are meant to prepare students for real life, the experiences afforded by interaction with mobile technology reflects the realities of the modern world (Robledo, 2012). Schools to this point, however, are vastly underutilizing mobile technology in the classroom. Teachers face many barriers when trying to seamlessly integrate these advanced instructional tools such as lack of training and lack of resources (Ertmer 1999; Kopcha, 2011). Teachers cannot effectively implement the use of instructional technology when they do not have access to the proper tools and training (Koc & Bakir, 2010).

As early as 1954, B.F. Skinner forecasted the potential for technology to revolutionize how students learn and how teachers deliver instruction. He developed the first "teaching machine" which delivered targeted, self-paced lessons that were individualized to students (Benjamin, 1988). Others predicted that the advancement of personal computers would revolutionize the classroom (Ertmer, 1999). Unfortunately, these predictions have been met with hesitation and

resistance leaving teachers to resort to traditional and less effective instructional methods (Cuban, 2001; Ertmer, 1999; Francom, 2016; Kopcha, 2011). Mobile technology, with fluid implementation and progressive school policies, can lead the way to educational reform and increased learning outcomes for all students (Mcquiggan, Kosturko, McQuiggan, & Sobourin, 2015).

Mobile learning refers to the experience and opportunity afforded by the evolution of educational technologies. It has less to do with the actual physical device itself but rather indicates "anywhere, anytime learning enabled by instant, on-demand access to a personalized world filled with the tools and resources we prefer for creating our own knowledge, satisfying our curiosities, collaborating with others, and cultivating experiences otherwise unattainable" (McQuiggan, Kostruko, McQuiggan, & Sabourin, 2015, p. 8). Mobile learning embodies the concept of life-long learning as it reconfigures the structure of teacher-student, and formal-informal learning and teaching; it indicates something broader than simply the use of a mobile device. The success of mobile devices in changing the current structure of schools depends upon the pedagogy and preparation taken to integrate the devices fully into the curriculum. It is necessary to banish the assumption that K-12 students and young teachers understand how to use their mobile devices for educational purposes (i.e. mobile learning) because, while they may be skilled at using their devices for communication and social networking, true mobile learning requires students to tap into unique complex skillsets (McQuiggan et al., 2015). Students must be guided by their teachers to use their mobile devices for the higher order thinking skills inherently fostered by these devices including: critical thinking and problem solving, communication, collaboration, and creativity and innovation (Partnership for 21st Century Learning, 2007).

In order to fully integrate mobile technology into the classroom, teachers themselves must be adequately trained and prepared to fully integrate mobile technology into their everyday instruction and embed their curriculum with mobile learning opportunities. Each year approximately 190,000 teacher candidates graduate from teacher preparation programs in the United States (Demonte, 2015). The majority of these teachers are from a generation commonly referred to as the Millennials or digital natives. This is the first group of educators to grow up with technology, however research consistently shows that growing up and being familiar with mobile technology does not equate to effective use of mobile technology in the classroom (Lei, 2009). Research suggests teachers typically use technology for administrative purposes such as sending emails, and taking attendance or as a supplement to support traditional instruction such as use of an overhead projector to present lecture notes. This research demonstrates that it is up to the teacher, not the technology, to determine if technology will be utilized effectively emphasizing student engagement and active learning (Cuban, Kirkpatrick, & Peck, 2001; Doherty & Orlofsky, 2001; Waight & Abd-el-Khalick, 2007).

Technology in teaching and pre-service teacher preparation has been a national priority since 1983 when the National Commission on Excellence in Education issued *A Nation at Risk: The imperative for Educational Reform,* which assessed the major hurdles facing the American education system and offered solutions. The commission recommended that secondary level students be required to take at least one computer course and that teaching materials should begin integrating technology into instruction. The commission found that "the vast majority of those now teaching or planning to teach have had little or no computer education or training" (U.S. Congress, 1988, p.122). The report also highlighted the need for ongoing training of teachers to fully and effectively implement technology in teaching.

Following the initial federal reform, further investigation of national technology plans was commenced to determine how technology was being taught and adopted in U.S. classrooms. In 2000, the Department of education found that "new teachers entering the profession are still not being adequately prepared to teach with technology…. fewer than half of the nations' teacher

preparation institutions require student to design and deliver instruction using technology, and that even fewer require technology use in the student teaching experience." (U.S. Department of Education, 2000, p.5). Preservice teachers were typically being introduced to a broad range of instructional technology in stand-alone introduction to educational technology courses, resulting in technology instruction that is decontextualized from content area teaching and minimally implemented (Hargrave & Hsus, 2000; Wetzel, Foulger & Williams, 2008-2009). In 2010 the fourth plan, *Transforming American Education: Learning Powered by Technology,* pointed out that "technology should be used in the preparation and ongoing learning of educators to engage and motivate them in what and how they teach" (U.S. Department of Education, 2010, p.11).

A close examination of the technology plans beginning in 1996 and reauthorized three more times in 2000, 2004, and 2010 demonstrates a shift from improving technology literacy to increased adoption of technology in the classroom and highlights the fact that new teachers are still not adequately prepared to adopt technology in their future classrooms. This confirms an un-met need to establish a 21st century model technology integrated instruction and learning which focuses on connected, mobile learning.

Studies have evaluated the best way to integrate technology into teacher education and have revealed that the traditional strategy of offering a single educational technology course does not provide pre-service teachers with the necessary skills to integrate technology into their future practice (Bakir 2015; Wachira & Keengwe, 2011). Kay (2006) identified ten key technology integration strategies some of which include: offering mini-workshops, integrating technology into all courses; modeling how to use technology; using multimedia; encouraging collaboration between pre-service teachers and mentor teachers, practicing technology in the field; and improving access to technology.

The prevalent perception in the field is that technology training should be integrated throughout the entire teacher preparation program, however research consistently demonstrates that pre-service teachers are still not being adequately prepared to integrate technology in their future classrooms (Bakir, 2016). This was highlighted in a review of the literature by Balderaz and Rosenblatt (2016) in which the authors found that only five experimental studies between 2006-2016 included and evaluated the use of mobile technology training in teacher preparation programs. Within those five identified studies, only one focused on the use of mobile technology in a special education class.

Assistive technology (AT) was once considered a highly technical service provided to individuals with disabilities through special education services. Traditional AT refers to any item, piece of equipment, software program, or product system that is used to increase maintain, or improve the functional capabilities of persons with disabilities (Assistive Technology Industry Association, 2016). Recent advances in the use of mobile technology in education has led to a merger of highly technical "assistive technology" with more ubiquitous mobile technology devices such as cell phones and tablets, as these tools are commonly used by all students in a technology integrated classroom. Mobile devices, through the development of specialized applications, now provide opportunities for people with disabilities to interact with the world in an independent manner. As technology begins to permeate educational programming, it is critical that special education teachers and other service providers are well trained to identify and integrate the most promising of these mobile technology tools. There is mounting research to support the use of mobile devices to support students with a variety of disabilities including autism, intellectual disability, visual impairment, learning disability, hearing impairment, communication disorder, traumatic brain injury, etc. (Ayers, Mechling, & Sansosti, 2013). Research also suggests that the largest barrier faced by special education teachers is lack of time, resources, and training (Kopcha, 2011). While it is up to independent school districts to equip their teachers and students

with mobile technology, teacher preparation programs should ensure that pre-service programs adequately train special education teachers in the use of mobile and assistive technology.

Method

Given the potential of using mobile technology in instruction, especially for students with disabilities, and the limited amount of research on its use in teacher preparation, this study sought to determine the impact that mobile technology instruction had on teachers' beliefs about the value of using mobile technology in instruction with students with disabilities. This study also sought to identify predictors of the frequency of technology use in the classroom. It was reasoned that before mobile technology use in instruction can be widespread, the factors, whether systematic or personal, which inhibit adoption must be identified. Once identified, the appropriate intervention strategies can be incorporated into the teacher preparation/continuing education program. The research questions examined were:

1. Is there a difference in graduate students' beliefs about mobile technology use in teaching and learning after participating in an online class where mobile technology was used extensively?
2. What beliefs about the use of instruction with mobile technology with students with disabilities predicted individuals' frequency of use?

Participants and setting

This study was carried out with a class of 32 graduate students in an online Master's of Arts in Special Education program in the College of Education. Although the participants attend a four-year university in a rural area of a southwestern state, a majority of the students in this program live in other locations around the state. As part of the degree, these students took a course, Programs and Practices, that focuses on the unique interventions and strategies for teaching students with cognitive disabilities and is taught by one of the authors. Specifically, this course teaches graduate students about the characteristics, identification process, referral procedures and educational practices involved in working with students with cognitive and behavior disabilities. This course was designed to include extensive instruction on mobile technology and applications (apps) embedded throughout. Three course assignments were created to evaluate students' ability to use mobile technology in instruction with students with disabilities in their own classrooms. Prior to accessing the course content, students were asked to answer an anonymous survey containing questions about their attitudes and beliefs about teaching and learning with mobile technology. After the course, students were again asked to complete the questionnaire about their beliefs related to teaching and learning with mobile technology. Five students were randomly chosen to participate in a virtual focus group, of which three students actually participated. Focus group participants were asked to describe their initial thoughts on using mobile technology in their graduate coursework, prior learning experiences using mobile technology, challenges they faced in using mobile technology in coursework and in their own classroom, as well as the strategies and methods they used to overcome the challenges of learning with and teaching with mobile technology.

Videos and course plan

To provide students with extensive instruction on mobile technology use in the classroom, a number of video tutorials were uploaded to the course learning management system (LMS). Each video described the use of the app, provided an introduction and a short explanation of why the app was chosen and included possible individual and instructional uses. Videos were made available to participating students through course modules delivered through the institution's LMS. The course plan had a total of 60 hours of course time over an eight-week period. The course modules contained specific information about which videos the students were expected to

watch during each week of instruction and the activities that corresponded with each of the videos that students were to complete to reinforce and extend learning.

Mobile technology activities

To engage and assist teachers as they increased the use of mobile technology throughout the online class and in their own classroom, the instructor redesigned the course learning activities to make a much larger focus on active learning and student centered activities possible. Thus, a number of exercises and assignments were developed for class. Each activity was developed to extend learning and promote the use of the app within the student's own classroom.

Online questionnaire

Data was collected using an adapted version of a previously validated survey from the Institute of Education Sciences (IES) on the use of educational technology in U.S. public schools (Gray, Thomas, Lewis, & Tice, 2010). The survey contained a series of questions regarding basic demographics, primary teaching role, teacher use of technology and beliefs about mobile technology used in the instruction of students with disabilities. The dependent variable in this study was teacher beliefs about the use of mobile technology with students with disabilities. Beliefs were measured by the 15-item Likert-type scale. The survey was made available to all students on surveymonkey.com via a link on the course LMS. Demographic and teaching role questions included yes/no questions, fill-in-the blank questions and categorical questions such as, "Do you anticipate working in a(n): (a) Rural community, (b) Suburban community, and (c) Urban community?". Teacher technology use questions were rated on an ordinal scale of 1 = *multiple times a day* to 5 = *seldom/rarely* or 1= *daily* to 6 = *not applicable*. Teacher belief questions were also rated on an ordinal scale of 1 to 4, ranging from 1 = *at least daily* to 4 = *don't know* and 1 to 5, ranging from 1 = *strongly agree* to 5 = *strongly disagree* with a higher score corresponding to limited in the benefits of using mobile technology in instruction with students with disabilities. The online questionnaire was made available to all participants March 14 and April 15. Reminders were sent to students after seven days. The pre-survey closed on March 22 and May 7 for the post-survey. Categorized results are also presented in tabular form in the results section with scales and items enumerated to provide readers details of the crude data. The independent variable was the embedded mobile technology instruction that was part of the course. Data analyses were performed Statistical Package for the Social Sciences (SPSS) V.21.

Results

Of the 33 students invited to participate in the survey only one did not participate in the pre-survey. All 33 students participated in the post-survey. All students who completed the pre-course and post-course survey received embedded instruction on mobile technology use in their classroom.

Beliefs about mobile technology

For the sake of anonymity, data collection did not include a unique ID to each participant, therefore an analysis of change (i.e., a true pre-survey post-survey) was impossible. However, since data was collected during both time points, it was possible to conduct separate predictive analysis to determine what possible impact the training had on the predictive qualities of the independent variables onto the dependent variable of frequency of technology use in the classroom.

The dependent variable was dichotomized into those who indicated using technology at least daily and those who reported using technology less frequently than daily. This was assessed using the question: *How often did you/do you use technology while working with students in your teaching or internship experience(s)?* The list of independent variables included: 1) Teacher role (i.e., General education vs. others), 2) Technology Self-Efficacy (Range = 1 – 5), 3) Perceived

Technology Classroom Support (Range = 1 - 5), 4) Perceived Technology Training (Range = 1 - 5), 5) Frequency Beliefs about Technology Use (Range = 2 – 4), and 6) Anticipated Urbanity of Career (i.e., Rural vs. Suburban vs. Urban). These variables were entered into a forward regression analysis with conditional inclusion criteria of .05.

In the pre-survey model, the baseline odds of using technology less frequently than daily was significantly different than 0 in the negative direction. This suggests that teachers were significantly unlikely to use technology daily. Also in this model, self-efficacy related to technology use was the only independent predictor of using technology during instruction at least daily. Teachers with greater self-efficacy were at increased odds of using technology in their instruction; a one point increase in self-efficacy increased the odds three times. This model accounted for only 28% of the variance in technology use.

In the post-survey model, the baseline odds of using technology less frequently than daily was again significantly different than 0 in the negative direction. This, again, suggests that teachers were significantly unlikely to use technology daily. However, unlike in the pre-survey model, in this model, self-efficacy, frequency beliefs, and teacher role were all independent predictors of using technology during instruction at least daily. Greater self-efficacy and frequency beliefs resulted in increased odds of using technology in instruction. The influence of self-efficacy was stronger in this model, with a one-point increase in self-efficacy correlating to a more than 1,000-fold increase in the odds of using technology. Also, a one-point increase in frequency beliefs (i.e., how frequently teachers' belief technology can effectively be used in the classroom) increased the odds of daily technology use by 159 times. General education teachers were approximately 99% less likely than other teachers to use technology in the classroom at least daily. This model accounted for more than three-quarters of the variance in technology use.

Qualitative results

In an effort to illuminate the participant's beliefs and opinions about mobile technology use in the classroom, authors conducted an interview with participants from the study. Five students were invited to participate in a focus group session after the course ended. On the day of the focus group, three students participated. The following themes relating to mobile technology use in the classroom emerged from their interview: lack of resources, lack of training, fear when initially asked to implement mobile technology, increased engagement of students, and a desire to share experiences with others.

Feelings about mobile technology

All three participants expressed fear and hesitation when describing their feelings at the beginning of the course. They indicated that they did not feel comfortable with technology prior to the course and were unsure of what to expect. However, over the course of the semester, all participants stated that they became more familiar with and were eager to begin implementing mobile technology into their classroom at least on a weekly basis.

Overcoming challenges

Another emerging theme which developed in the interview was the challenge of limited training and limited resources. Prior to the course, each of the three participants reported that they had not participated in any training on the use of mobile technology. One participant has a set of "old iPads" in her classroom, another participant has to share access to the campus set of tablets for her classroom and the third participant has no school-provided access to mobile technology but instead she is using her own tablet in her classroom. To learn more about technology in general, participants' main strategy has been to collaborate with other more experienced teacher's and ask for suggestions on apps or other programs. After the course, the participants reported that they would feel comfortable sharing their knowledge with others or even hosting training sessions.

Value of mobile technology

Even with the challenges stated above, all participants found that there was great value in the use of mobile technology in their classroom. They reported that students were more focused, engaged, and more involved with activities when using mobile technology. One participant stated "we did an end of year project where they had to do research and they actually had a good time doing actual work because they were doing their own research using technology. I can see it in my kids, they are so engaged. The activities on the iPad are so interactive." Additionally, they were more likely to use project-based and group activities when integrating mobile technology into their instruction. One teacher reported an experience in which her students who were unable to demonstrate their learning through paper and pencil tasks were much more successful and confident when demonstrating their knowledge through mobile technology activities, stating "For some of the kids they can demonstrate using technology that they know it or can do it even when on pen and paper they can't demonstrate it and they are confident in it instead of physically struggling through like they do with a normal classroom assignment." In general participants found the video tutorials embedded into the course along with the assignments which required them to use mobile technology very useful because they felt the extra resources and practice increased their knowledge and confidence. Overall, the participants felt that the course was valuable, their knowledge of mobile technology and use increased as a result, and their students ultimately benefited from the experience.

Discussion

We found that students who participated in the online course that included explicit instruction in the use of mobile technology in instruction with students with disabilities expressed the belief of being better prepared to do so. Conversely, we saw no change in the mean scores for any other variable in the mobile technology survey after completing the course when compared with scores from surveys administered prior to the embedded instruction within the course. The results of the predictive analyses highlight two notes. First, teachers in the sample were generally unlikely to use technology in the classroom at least daily. In fact, computation of the null models (i.e., intercept only) suggests less that a 3% probability of daily technology use. This suggests that special education students may not be exposed to the advantages of technology in a consistent and persistent way during the natural course of their instruction. Second, the primary effect of the training seems to be that it not only elucidated but also manufactured variables that can be targeted for interventions designed to increase technology use. For instance, in the pre-test model, only a teacher's self-efficacy was predictive of daily technology use. However, in the post-test model, the cognitive beliefs associated with how frequently technology could be used as well as teacher role became salient predictive variables. Though, due to the lack of viable change analysis from the absence of unique participants' identifiers, the training itself cannot be cited as the cause of any change, it does appear that, as a result of the training and the present analysis, that future interventions geared toward increasing teachers' likelihood of daily technology use could best target their self-efficacy, frequency beliefs, and the role of technology in their classroom based on their professional role in the school.

Research about the use of mobile technology in instruction for students with disabilities is still very limited. Furthermore, published research has focused on the effect of the method in terms of graduate student/educators' performance in the classroom. Thus, the available knowledge of teacher training and the use of mobile technology instruction is very narrow.

Limitations

There are several limitations to the present study. First, the study investigated only students' subjective experiences and beliefs. Whether or not the students used or continued to use mobile technology in instruction was not investigated in this study. Additionally, there was no way to

connect the individual participants' pre-course survey data to post-course survey data thus limiting the researchers' ability to show that the intervention was successful in improving participants' beliefs about the use of mobile technology in instruction for students with disabilities. Finally, the results have limited generalizability as instruction, apps, and the implementation of technology with students with disabilities can take on many forms with a variety of disability categories.

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Editor's Note: This kind of study is valuable to assess how well a particular software or system of learning is serving the needs of the institution, faculty and students. It also provides key data to improve overall effectiveness when using this toolset.

Factors affecting EFL learners' use of the computer language learning program *Tell Me More*.

George Gyamfi and Panida Sukseemuang
Thailand

Abstract

Tell Me More (TMM) is one of the advanced self-learning programs that may have a comprehensive solution for language learning. This study aimed at investigating factors affecting EFL learners' practices with the TMM program. A survey and a follow up focused group interview was conducted with 340 and 10 learners respectively to assess their perceptions of usefulness and ease of use of the program. The findings showed that learners had a moderate perception of TMM's usefulness and strongly agreed to its ease of use. Additionally, the learners perceived that the TMM program was useful for developing their pre-communicative competence rather than spontaneous interaction and communication skills. Furthermore, though the program enhanced learners' interest and motivation in learning, the grammar and writing aspects demotivated learners while they used the application. The study concludes that even though the Tell Me More program is useful for autonomous learning, it will be better suited for use in a blended learning environment to compensate for the lack of authentic and spontaneous interaction. Lastly, some aspects of the program (grammar, writing and speech recognition) need to be improved to satisfy the needs and preferences of users.

Keywords: Tell Me More, autonomous learning, technology acceptance model, perceived usefulness, perceive ease of use, computer assisted language learning.

Introduction

The computer and the web offer an innovative opportunity for language learning. This is so because it is one of the primary modes of information delivery with majority of its content available at no cost. In this light, educators have seen the web as a way of complementing the traditional face-to-face teaching to increase exposure and contact among language learners. Computers are used to challenge language learners to produce accurate linguistic forms through working with multimedia resources like word processors, World Wide Web, browsing, chatting, emailing, forums, discussion boards and so on. The rapid advancement has propelled the use of computers for language learning into a new landscape. Institutions have also purchased computer-learning programs for various reasons, but what determines its success is its fulfillment of educational objectives and learners' satisfaction with the program.

In spite of its potential to help learners develop interest in learning the English language skills and overall English language proficiency, Kern, Ware & Warschauer (2004) have reported that learners have sometimes shown reluctance, low level of motivation and dissatisfaction when they learn online. In other words, learners' may have different views of how language should be taught and learned, and their roles and responsibilities in the entire learning process. One factor responsible for this is learners' perceptions of learning via online. According to Davis (1989), the perception learners' have about how useful and easy is it to learn online may affect their attitude towards and intention of use. To Wagner (1994) learners' perceptions of the medium of learning, their technological proficiency and the course content are factors that may either make learners use or not use online learning resources. Melor (2007b) also pointed out that computer access,

time constraints, individual computer skills and hardware issues, learner socio-cultural backgrounds, previous knowledge and learning experiences all have an effect on learners' use and satisfaction with CALL programs.

What is Tell Me More?

Tell Me More is an asynchronous online learning system and one of the advanced self-learning tools that may have a comprehensive solution for language learning. *Tell Me More* seeks to tutor learners by exposing them to over 850 hours of learning content, exercises and different varieties of tasks ranging from vocabulary, grammar, writing, pronunciation, listening and speaking. The content of the online learning platform is structured around authentic events such as at the airport, weather forecast, a linguistic function and part-mode guided-listening to a dialogue on a scenario of communication. It is followed by an activity of interaction, pronunciation and standard activities of vocabulary and grammar (crossword puzzles, dictation).

Technology Acceptance Model (TAM)

This study used Davis' (1989) technology acceptance model (TAM) to evaluate and explain the factors that influenced learners' use of the *Tell Me More* program. Grounded in the theory of reasoned action by Fishbein & Ajzen (1975), TAM explains that users' subjective norms, beliefs, attitude and intention of use determine users' behavior towards technology. Davis (1989) further explained those two important cognitive beliefs, perceived usefulness (PU) and perceived ease of use (PEU), influence learners' attitude (AT) and behavioral intent to use (IU). According to Davis (1989), perceived usefulness (PU) means the extent to which technology enhance one's performance in a given job or skill. This helps us understand how learners perceive a technology as offering a different means of learning and acquiring educational knowledge. Perceived ease of use (PEU) then refers to when users are able to use a particular technology with little or no difficulty. PEU is also, "the extent to which one believes learning will be free of cognitive effort" (Park, 2009 p.57). According to Davis et al., (1989), attitude towards usage (ATU) in TAM means the positive or negative feeling about a technology based on perception or experience. Hence, the perception process in the technology acceptance model (TAM) are perceived usefulness, and perceived ease of use which in turn affects learners' attitude towards usage, their behavioral intent and finally their actual use. The model further proposes that there are some external factors or variables such as gender and proficiency level influences perceived ease of use and usefulness.

Therefore, the relevance of TAM in investigating factors affecting learners' use of *Tell Me More* is worthwhile because it will not only tell us learners' perception of a learning technology but it also gives us explanation to what affects learners use, acceptance and refusal of TMM and how this could be improved. In sum, what seems to be missing in research on *Tell Me More* is factors affecting learners' use. In fact, there is a dearth of research on TMM's usefulness and ease of use in different socio-cultural settings. The study was designed to explore two of the most important factors that influence learners use of the TMM program. Below are the questions that guided the study

1. What are learners' perception of the usefulness of the *Tell Me More* program?
2. To what extent do learners perceive the program as easy to use?

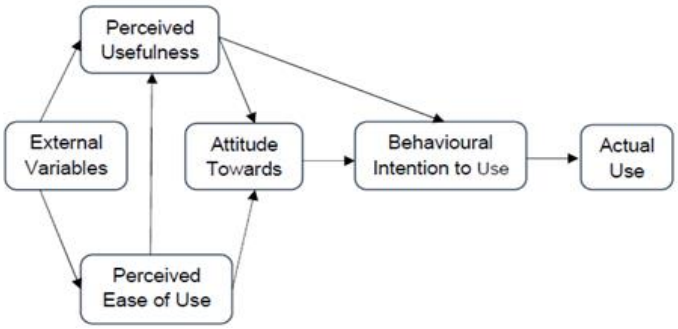

Fig.1 Technology Acceptance Model. Davis, (1989)

Related studies on *Tell Me More*

Yunus, Hasim, Embi & Lubis (2010) surveyed 85 users who were university learners and four lecturers in Malaysian University on their utilization of *Tell Me More*. The student participants claimed to find it useful for learning English. This is so because improved their overall proficiency in English. Participants in the study also valued the adequacy of the program to improve communication, grammatical and lexical skills, its potential to facilitate learning and the originality of the materials and activities. The lecturers also indicated that the courseware was a useful supporting tool and it affirmed their positive perception on its suitability, ease of use and usefulness.

Nielson (2011) study on adult learners who used *Rosetta Stone* and *Tell Me More* to improve their proficiency in Spanish, Arabic and Chinese revealed that despite the ease of accessing the software, learners lacked compliance in using the resources due to compounding technological problems and insufficient support for their autonomous learning. This resulted in participants' gradual loss of interest in the programs.

In the study by Espinosa (2013) conducted in Spain at the university of Malaga on the perspectives of 75 teachers who enrolled on *Tell Me More* for a period of six months showed that the version 9 of TMM, in general terms, does not seem to excite users. The teachers manifested a degree of satisfaction with the program between moderate and low in terms of interest, usefulness and effectiveness to train in a spontaneous oral English and communicative use. However, the data also indicates that respondents saw a moderate breakthrough in some communication and language skills such as oral and written comprehension, vocabulary, grammar or pronunciation. In addition, some components and features of the program, for example, the technology of speech analysis that it incorporates, although they generate discontent and criticism among some users, accounted for other benefits or merits. This circumstance shows that *Tell Me More* as a tutorial CALL has deficiencies and allows guessing. The program fits a few more learning styles and preferences than others.

Another study by Perez (2014) on both paramedical and medical students in a Philippine university revealed no significant difference in students' responses in relation to the effectiveness of *Tell Me More* in enhancing their communication skills. Users further disagreed that they encountered difficulties while using the language resource.

Kuama & Intharaksa (2016) examined the perceptions of students on the perceived problems they encountered, their learning strategies, and their thinking about the designs and content of English learning tasks in an online course that had TMM as the online course component. Whiles the respondents perceived that the designs and contents of learning tasks in the online course were appropriate for their language proficiency. They also revealed that they encountered problems with the technology and were not self-motivated.

Clearly, though some of the aforementioned studies on TMM have focused on its effectiveness in improving students' overall proficiency. Also, many researches on the use of *Tell Me More* have been conducted in countries where majority of users are English as a second language users, for example Malaysia and the Philippines. Learners in such a setting may perceive online learning English differently from those who study in a foreign language context.

It is understandable to conclude that the previous research is not generalizable given the characteristics of participants in terms of number, context, training, perception, proficiency, learning goals and motivation in learning English.

Methodology

Sample

The participants for this study were 340 learners in a university in the south of Thailand who used the *Tell Me More* program during the 2015 Academic Year. They used the program for 40 hours. They completed the full *Tell Me More* course that had a placement, progress and achievement test as its components. The sample was from various faculties and were of different proficiency levels. After the survey, 10 of the participants were selected for a focused group interview.

Instruments

The study adopted a mixed method strategy by using questionnaires and a focused group interview for data collection. This was done to allow the researcher to simultaneously collect and concurrently analyze the data to confirm findings in relation to the impressions and opinions of respondents of a study (Creswell, Clark, Gutmann & Hanson, 2003). For the questionnaires, while most were adapted from Davis (1989) Technology Acceptance Model (TAM) some of the items were self-created.

Piloting, credibility and reliability

Since the respondents were Thai learners, the questionnaire was translated from English to Thai with the help of a professional translator. Three panelist who are experts in educational technology and translation reviewed the instruments for its validity and credibility. The questionnaire was piloted among 50 students who used the program in the summer of the 2015 Academic Year. The items consisted of the perceptions of learners regarding the usefulness and ease of use of *Tell Me More*. There were 12 items in all that measured perceived usefulness (8 items) and perceived ease of use (4 items). The Cronbach alpha values for the perceived usefulness and perceive ease of use were α =.771 and α =.743 respectively. The scales for this part ranged from strongly disagree (1) to strongly agree (5). A semi structured focused group interview was also to collect data to confirm findings of the questionnaire.

Data collection and analysis

There was a high return rate of 340 questionnaires out of 350 questionnaires distributed. The distribution and collection of the data was done at the end of the first semester of the academic year 2016. The data was statistically analyzed for the frequency, means and standard deviations using an SPSS program. Responses from the focused group interview that was conducted in Thai were also transcribed and translated from Thai to English with the help of a translator. The findings were concurrently analyzed to confirm the relationship between the survey and opinions of respondents of a study**.**

Findings

Perceive usefulness

The first part of the questionnaire elicited response of learners' perception of the usefulness of the *Tell Me More* program. The results from the descriptive statistical analysis (frequency, percentage, mean and standard deviation) and focused group interview are as follows.

In the Table 1 below, 53.8% (183) and 5.6% (19) of the participants agreed and strongly agreed that the program was useful for practicing and improving their listening skills. 30% (102) of the participants were however not sure whether the program was useful for listening while 8.8% (30) of the participants disagreed while 1.8% (6) strongly disagreed with the program's usefulness for listening. The mean and standard deviation for this item was X=3.53 and S.D=.803.

As regards its usefulness for practicing speaking and pronunciation, a similar proportion of 42.4% (144) and 4.7% (16) of the participants agreed and strongly agreed that the program was useful for that purpose while 34.4% (117) were not sure whether the program effectively served that purpose. On the other hand, 16.2% (55) and 2.4% (8) disagreed and strongly disagreed that the program was not useful for practicing either speaking or pronunciation. The mean and standard deviation for this item was X=3.31 and S.D=.883

In the case of reading, whereas 56.8% (193) and 5% (17) agreed and strongly agreed to TMM's usefulness for reading, 25.6% (87) were not sure while 10.6% (36) and 2.1% (7) disagreed and strongly disagreed with its usefulness for reading. The mean and standard deviation for this item was X=3.52 and S.D=.829.

For writing, there was almost a divided perception. Whereas a 38.2% (130) and 2.9% (10) agreed and strongly agreed to its usefulness for writing, 37.9% (129) were not sure. 18.5% (63) and 2.4% (8) disagreed with the program's usefulness for writing. The mean and standard deviation for this item was X=3.21 and S.D=.859.

As regards grammar knowledge, 44.1% (150) and 4.4% (15) of the participants agreed and strongly agreed with the program's usefulness for enhancing their grammar knowledge. However, 119 (35%) were not sure about that while 48(14.1) and 8(2.4%) disagreed and strongly disagreed. The mean and standard deviation for this item was X=3.34 and S.D=.859

189 (55.6%) and 33 (9.7%) of the participants indicated that the program was very useful for vocabulary learning but 80 (23.5%) were not sure, leaving only a 29 (8.5%) and 7 (2.1%) to disagreed and strongly disagreed with the program's usefulness for improving vocabulary learning. The mean and standard deviation for this item was X=3.70 and S.D=1.769

On the whole, 164 (48.2%) and 14 (4.1%) agreed and strongly agreed that the program was useful for improving learners overall language proficiency. While 122 (35.9%) were not sure, 32 (9.4%) and 7 (2.1%) disagreed and strongly disagreed that with the usefulness of the program to improve overall English language proficiency. The mean and standard deviation for this item was X=3.42 and S.D=.822

The transcript and translated responses from the focused group interview were also carefully analyzed to highlight learners' perception of the program's usefulness. The results indicated that the learners in general agreed with the usefulness of the TMM program in terms of how it helped improve their listening, speaking, pronunciation, reading and vocabulary knowledge. For example, one participant retorted during the focused group interview:

> "The *Tell Me More* program is good for practicing my speaking and pronunciation skills since I do not have other English language speakers to practice speaking English with."

Another interviewee said

> "The *Tell Me More* program is not boring when it comes to the speaking and pronunciation parts because it is interesting, comparable to the native speaker and useful for improving my English language speaking ability even though it is challenging to use at times."

However, they reported that the writing and grammar aspects of the program though useful were inadequate. One participant said

> "The program is useful for improving other English language skills but not writing and grammar knowledge because there are no explanations given to the wrong sentences I write. I don't know which part of the sentence is ungrammatical so I become confused"

Another participants remarked as follows,

> "The writing and grammar parts make the program boring and uninteresting to use. I am always marked wrong for a whole sentence even though I know that some parts of my sentence is grammatical. I don't get an explanation of which exact part is ungrammatical and how to correct it."

In relation to the reading part, a participant said,

> "Though the reading texts in the program is useful, it is challenging for me because the words in the passages are sometimes beyond my current level of knowledge. And I sometimes do not understand the context of the passage."

Table 1

Results for items on the usefulness of *Tell Me More*

(Mean, Standard deviation, Frequency & Percentage)

	Perceived usefulness	Strongly disagree	Disagree	Not sure	Agree	Strongly Agree	X	S.D
1.	TMM helps me improve my listening skill.	6(1.8%)	30(8.8%)	102(30%)	183(53.8%)	19(5.6%)	3.53	.803
2.	TMM helps me improve my speaking and pronunciation skill.	8(2.4%)	55(16.2%)	117(34.4%)	144(42.4%)	16(4.7%)	3.31	.880
3.	TMM helps me improve my reading skill.	7(2.1%)	36(10.6%)	87(25.6)	193(56.8%)	17(5%)	3.52	.829
4.	TMM helps me improve my writing skill.	8(2.4%)	63(18.5%)	129(37.9%)	130(38.2%)	10(2.9%)	3.21	.859
5.	TMM helps me improve my grammar knowledge.	8(2.4%)	48(14.1%)	119(35%)	150(44.1%)	15(4.4%)	3.34	.859
6.	The activities in TMM are useful for vocabulary learning.	7(2.1%)	29(8.5%)	80(23.5%)	189(55.6%)	33(9.7%)	3.70	1.769
7.	I have improved my overall English language proficiency.	7(2.1%)	32(9.4%)	122(35.9%)	164(48.2%)	14(4.1%)	3.42	.822

Ease of use

Four items in Table 2 measured learners' perception of the ease of use of the TMM program. In general, majority of the participants agreed that it was easy to use. Specifically, 151(44.4%) and 25(7.4%) agreed and strongly agreed that the program is easy to use because it could be used to learn English at any time. While 100(29.4%) remained undecided, 47(13.8%) and 17(5%) disagreed and strongly disagreed. The mean and standard deviation for this item was X=3.35 and S.D=.977

144 (42.4%) and 15(4.4%) agreed and strongly agreed that the activities in the program are easy to do. However, 129(37.9%) were not sure while 46(13.5%) and 6 (1.8%) disagreed and strongly disagreed. This item had a mean and standard deviation of X= 3.34 and S.D= .832 respectively.

185(54.1%) and 26(7.6%) also agreed and strongly agreed that the navigation in the program was easy to understand and follow. 38(11.2%) and 7 (2.1%) disagreed and strongly disagreed that the direction in the program was easy to follow while 85(25%) were not sure. The mean and standard deviation for this item was X=3.54 and S.D=.866

Furthermore, 141(41.5%) and 13(3.8%) agreed and strongly agreed that the program gave them other ways to answer questions. 138(40.6%) were not sure while 42(12.4%) and 6(1.8%) disagreed and strongly disagreed. The mean and standard deviation for this item was X=3.33 and S.D=.808

In relation to the ease of use, one participant said

> "The program is good and easy for learning English especially for beginners because it contains tips and tricks which helped me improve my English language skill especially my pronunciation."

Another participant commented that

> "What makes the program easy to use is that I can skip to any activity of my choice since I am not obliged to follow the activities systematically. I sometimes select an activity I like if I find the previous one uninteresting or difficult or too easy to do."

Table 2.
Results for items on ease of use of *Tell Me More*
(Mean, Standard deviation, Frequency & Percentage)

	TMM is easy to use because	Strongly disagree	Disagree	Not sure	Agree	Strongly agree	X	S.D
8.	It is easy for me to learn English with TMM anytime.	17(5%)	47(13.8%)	100(29.4%)	151(44.4%)	25(7.4%)	3.35	.977
9.	The learning activities in TMM are easy to do.	6(1.8%)	46(13.5%)	129(37.9%)	144(42.4%)	15(4.4%)	3.34	.832
10.	The directions in TMM are easy to understand and follow.	7(2.1%)	38(11.2%)	85(25%)	184(54.1%)	26(7.6%)	3.54	.866
11.	There are many ways to answer the questions.	6(1.8%)	42(12.4%)	138(40.6%)	141(41.5%)	13(3.8%)	3.33	.808

Another participant made an interesting comment about the program's ease of use:

> "Yes, the direction did not help me much because I didn't understand it and I did try and error. I could easily follow the directions because I had done the activities in the program several time and I knew the next step I had to take."

Discussions

As far as the usefulness of the program is concerned (Table.1), the learners' perceived that it improved their vocabulary knowledge ($\bar{X}$=3.70), reading ($\bar{X}$=3.52) and listening skills ($\bar{X}$=3.53). This showed learners positive perceptions about these aspects of the program. This may be probably because there are enough vocabulary, reading and listening activities in the program. They however perceived that had moderate improvements in grammar knowledge ($\bar{X}$=3.34), writing ($\bar{X}$=3.21), speaking and pronunciation skills ($\bar{X}$=3.31). The program's ability to improve learners' vocabulary knowledge, reading and listening skills signifies that it may not be useful for developing the communication and interactive abilities of learners. It may however be effective for developing learners' pre-communicative skills as evidenced by their perception.

Though the findings provides evidence that the program is useful for learning pre-communication lesson, the learners still expressed discontent with the writing and grammar aspect. Their report that the program marks every part of the sentence they write as wrong coupled with few grammatical explanation to explain why, shows that the program still needs to be improved to stimulate learners for better write-ups through the provision of adequate grammatical explanation. This would eventually help learners in outlining and organizing their write-ups. This finding sharply contrast Perez (2014) research which reported that learners perceived highly of the writing part in the program because it provided them feedback, reviewed their grammar and improved their organizational skills.

Despite being one of the attractive features of the program, the speaking and pronunciation function (speech recognition) did not generate much enthusiasm among the learners (Table.1). The responds from the data revealed that the learners appreciated that the program gave them the opportunity to model their pronunciation according to the native speaker. This helped them mimic or imitate words and phrases they may not get the opportunity to use in their daily life. They also found it useful since they could record their voice and play it back. This enhanced learners' interest and motivation. However, they reported that the speech recognition function picks up any sound and records it as correct. There was no proper feedback except for the sound waves that indicated the level of accuracy of their pronunciation. This finding confirms the study by Espinoza (2013) and further contradicts the study by Yunus et al, (2010) and Perez (2014). The users in both Yunus et al, (2010) and Perez (2014) study showed positive perceptions and high satisfaction with the speech recognition function because it provided users the opportunity to imitate the phonemes without a text.

Additionally, the moderate mean scores recorded for items on speaking and pronunciation ($\bar{X}$=3.31), grammar ($\bar{X}$=3.34) and writing ($\bar{X}$=3.21) attest that the program is not fully equipped to train users for spontaneous and authentic use of the English language for real life communication. These findings further contradicts the research by Yunus et al, (2010) and Perez (2014) but confirms the findings of the study by Espinoza (2013). However, some external variables such as learners' motivation and attitude have been found to have an effect on their perceptions of and practices with tutorial CALL programs (Ushioda, 2005).

Like other researches on other tutorial CALL products, the results of this study indicate that users have different perceptions of Tell Me More. These can influence users' language learning practices with the program. Considering the fact that the current study was conducted in Thailand, and the other studies by Yunus et al. (2010), Perez (2014) and Espinoza (2013) were conducted in

Malaysia, Philippines and Spain respectively, it is clear why there are similarities and differences in the findings. Additionally, learners in these settings may differ in learning styles and preferences. These could also account for the different perceptions of the program according to its usefulness and easy to use.

Furthermore, the moderate score for overall improvement in the proficiency ($\bar{X}$=3.42) of the learners may be because the learners may not have used the program actively and independently to discover learning that is meaningful to them. Another factor that may be responsible for this is that the learners may have preferred the traditional or blended mode of learning even though the TMM program provided learners with additional opportunity for English language use to improve their competence. The feedback and explanations learners got from most of the activities in the program may further account for why learners found it to be useful for vocabulary, reading and listening.

In relation to its ease of use (Table 2.), the findings from both the survey and focused group interview showed that the TMM program to a larger extent was easy to use to study English anytime without difficulty ($\bar{X}$=3.35). The learners also agreed that the simple and clear language used in the program made it easy for them to understand the lessons in it ($\bar{X}$=3.34). Responses from the interview revealed that the orderly presentation coupled with the activities that were at the right level of their ability made it easy for them to learn English with the program. They also agreed that the navigation in the program was easy to follow ($\bar{X}$=3.54) and most importantly there was not a single way to answer a question in the program ($\bar{X}$=3.33). They could refer to the answer key anytime for help when they face any challenge. Since EFL learners may sometimes feel shy and unmotivated to learn because they think English is difficult to study (Krashen, 2003), it may be concluded that the learners felt comfortable to use the program since the relationship between the computer-learning environment and the learners is non-threatening. Due to this student may feel at ease to learn by accepting and correcting any errors and mistakes they make in the learning process (Wan Irham & Shafinah, 2006).

Finally, though learners faced challenges especially with the navigation, they were pleased with the program since it gave them the opportunity to work at their own pace through its continuous use. This confirms the findings in the study by Yunus et al. (2010) and Perez (2014).

Conclusion

In general, the current study brings to light that the learners had moderate perceptions of the TMM program in relation to its usefulness and ease of use. These were the main factors that affected learners' use of the program. The program improved learners' pre-communication or linguistic competence more than their communication skills. Though some of the features of the program enhanced learners' interest and motivation, they still expressed their frustration with the inadequate grammar, writing and speech recognition features of the program. In sum, the Tell Me More program does not satisfy all the needs and preferences of users. Using it in a blended learning environment or providing users with additional learning materials may help compensate for aspects of the program that are inadequate.

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Editor's Note: The success of distance learning programs is tied closely to the quality of instruction and support services. The resulting perception or "branding" of the institution becomes a key factor in development and future growth of distance learning programs.

Effectiveness of an e-learning distance education program: an analysis of students' perception

Sita Mishra and Archana Tyagi
India

Abstract

The knowledge-based society, in an effort to meet the demands and challenges required in a dynamic environment, needs to continuously upgrade the information and skills of its professionals. With the advancement of technology, innovative forms of education through Internet have been opened to students around the globe. This has made distance education a more vibrant and rewarding experience for both the students and professors. The focus of this paper is to analyse students' perception of an online learning program through distance education. The results of the study indicate that students' perceived learning is significantly related to faculty interest, student's interest, pedagogical effect, and program organization. Respondents' specified student's interest as the most important construct affecting perceived learning followed by program organization, pedagogical effect, and faculty interest. Further, perceived learning was significantly related with satisfaction that leads to students' loyalty.

Keywords: Online learning, management education, perceived learning, pedagogy.

Introduction-

In a dynamically changing knowledge-based society, it is necessary to continuously upgrade the information and skills of professionals. With advancement of technology, innovative forms of education through Internet have been opened to students around the globe. This has made distance education a more vibrant and rewarding experience for both students and professors.

In the last two decades, the higher education sector has been transformed by globalization, open trade, and information technology. Teaching and learning in an online world can be a very diverse experience for both learner and professor. Interest in the online learning is on the rise and there is increasing research on the effectiveness of online education. E-learning is emerging as a widely used form of education and training in developing and in developed countries. In India, the education sector is also going through tremendous changes.

Management education in India is to be found in educational institutes such as the IMT Centre for Distance Learning, Sikkim Manipal University, Indian Institute of Technology - Delhi, Indian Institute of Management - Kolkata, Bangalore, Indore and Kozhikode ,Indian Institute of Foreign Trade, XLRI-Jamshedpur, Amity University online, The Sun Stone Business School, IGNOU, Great Lakes Institute of Management, and Indian School of Mines and Symbiosis Centre for Distance Learning, that have entered into the e-learning mode to reach out to a wide continuum of students, by providing diploma and certificate courses online.

There is also an impetus by government to promote e-learning initiatives in education by offering training to faculty to ensure smooth transitions for students from classroom learning to self-directed learning (Rao, 2011). Though e-learning programs in India are on rise in the last few years with entry of various institutes and organizations, students are still not very sure about the significance of these kinds of courses. Therefore, understanding about the various issues related to students' perception about e-learning and its tools and technologies is crucial. Gradually e-learning is becoming the preferred medium for training(s) in the corporate world, for it

encourages executives to learn new strategies while being at office. Training and development is generally highlighted by most organizations in order to augment knowledge capital as well as to be at par with the global competition (Bingham & Galagan, 2007; Solomon, 2005). There is lot of emphasis on promoting e-learning to enhance the knowledge capital of the workforce. Organizational learning was found to be positively related to company performance, based on Bhatnagar and Sharma (2005) and Bhatnagar (2007) study which was focused on 640 managers from public, private, and multinationals companies. Further, it was pointed out that line managers had a more significant role in developing e-learning programs than Human Resources (HR) managers.

Establishing a sense of presence is crucial for a learner in an online distance learning program, because it supports and quickens the learning process with a sense of satisfaction of owning the learning. The desire to learn online has increased tenfold in recent times. Online learning has dissolved the boundaries of time and space by allowing continuous lifelong learning in convenient forms anywhere, at any time of the day, at their own convenience. Learning has become crucial and necessary in a fast changing world, for it extends the flexibility to the students to learn in their own time. It is essential for students to understand and take charge and control their own learning in an online environment. Hence, the importance and thoughtfulness of designing such courses, with a strongly built intrinsic motivational factor to empower students to learn in a flexible and autonomy-based learning environment. The students' presence to learn online is supported by related issues. Perceived learning, pedagogical effect, faculty and student's interest in effective teaching and learning, and course/program organization, are discussed and analysed in this paper. Both asynchronous and synchronous online learning are in demand for education. Asynchronous teaching allows the learner to complete course related activities at the convenience of their own time. It also permits flexibility to the learners without creating undue pressure on them. On the other hand, synchronous learning takes place like discussions in a real classroom. Everyone get online at the same time on the Learning Management System, chatting, taking part in question and answers sessions, sharing PowerPoint slides or any other mode used by the instructor to impart the knowledge to students. Self-discipline and self-direction are key pillars of eLearning.

The goal of this paper is to study students' perception regarding online learning in distance education program(s). Students have unlimited access to information so teachers' are challenged to motivate students to engage with subjects (Ali & Ho, 2007). Keeping students motivated to learn in an environment of continuous overflow of information is a challenging task. In today's knowledge economy with shared content online, students tend to interact with the learning material in their own time instead of taking notes in the classroom. In the next section, the authors deliberate on the major determinants of perceived learning. The major determinants discussed in this paper are pedagogical effect and role of teachers in keeping students actively engaged in learning with a special emphasis on program organization in making the learning for students a significant and enriching experience.

Literature review

With the advancement of information and communication technology development, e-Learning is emerging as a new arena in modern education, (Sun et al., 2007). With the advent of the MOOC (Massive Open Online Courses), there is an accumulative body of research evidence which tends to address the numerous challenging issues faced in on line teaching and learning. Online courses target a different segment of the student population. Most online students are employed and thyerefore unable to attend regular traditional classes. The dynamic and fast changes in technological advancements requires adults to constantly upgrade their knowledge and skills in order to stay competitive in the job market (Devi, 2002). This has been made possible with the

help of online courses, where students design their own construct of knowledge by taking the responsibility of their own learning within a flexible environment.

Key variables need to be discussed to comprehend what makes online learning a success. Key characteristics of engaging pedagogy from the learner's perspective is to acquire knowledge, develop a good understanding of taught concepts, learn through collaborative means, and engage in authentic interaction between teacher and learner. An authentic teacher and student interaction refers to the prospect of creating an environment of free expression of thoughts and ideas without any fear or reprehension by the teachers and peers in the classroom. Research conducted by Arbaugh (2002) and Thurmond et al., (2002) have indicated that timely replies from faculty significantly impacts learner' satisfaction. Timely and structured support from the instructor, impacts satisfaction of the learner. An engaged and committed teacher's investment of time tends to be reflected in allowing and encouraging students to express and share their thoughts spontaneously. Hongmei (2002) contemplated that effective and successful online courses require a high degree of faculty participation and backing by peer students. Role of a successful instructor lies in motivating, inspiring, and facilitating genuine interactions among the students regarding the course.

In today's world, to have a presence on social media tools is relevant and desirable for learners and instructors. The concept of "E-Learning 2.0" (Safran et al., 2007), refers to the adoption of social media in learning or education where learners are empowered to create and organize their own learning activities. These social media tools are supportive of teachers and learners in facilitating on line learning.

It is appropriate for the instructor to create a desired (closed) group, joined only by the students and the instructor to share relevant articles, ideas and latest information through various social media tools. Students are encouraged to share information in a nonthreatening environment, associated with discussions of related and diverse topics. These course discussions can be broken down into smaller collaborative groups, with instructor's guided intervention. Such activities of interconnectedness will assist students in increasing their learning, by peer interaction and discussion leading to bonding with the course and peers and ultimately with the institution in the long run. Peer learning through discussion(s) will be at its best and (online) students will be motivated and encouraged for collective knowledge creation and active user participation. Joining (any) of these social media tools (as per course requirement), can be a relevant part of the learning in both asynchronous and asynchronous mode of learning, where the students can visit the group at their own convenience and pace. In other similar studies, a social bookmarking tool,

(Farwell and Waters, 2010), a blogging platform (Rosen and Nelson, 2008), or wiki software (Hazari et al.,2009) have been used to engage students in collaborative projects and encourages creating, editing, and sharing content. Bonding with peers generates an increasing sense of belongingness; hence the feeling of isolation in an online course can be minimized. This constructive and careful monitoring of the learners will allow the instructor(s) to teach and reach out at large enrolment classes in an intimate and interactive way. Responsible teaching and involvement of the instructors ultimately tends to get redirected in the knowledge creation and desired learning for the learners. The role of the instructor needs to be the role of a facilitator where it supports the discussion and enable the learners to gain new confidence. These collaborative enabled discussions, helps in bringing a desired enthusiasm and incentive of continuous learning for the students. In practice we can see that student's perception of pedagogical affect is being influenced by effective teacher and learners' interaction.

Programme organization tends to give clarity and direction to the students, which ultimately help students in dissipating the ambiguity and the uncertainty in an online course. Programme organization is a very fundamental teaching method, which if designed prudently tends to bring

clarity in the course and pave the way for ultimate satisfaction for the students. Feldman (1998) described instructors' organization, clarity, and comprehensiveness as vital issues in the student learning process. A well designed programme organization is comprised of course objectives, course contents, details of textbook and additional readings and assessment methods and grading policy. A well designed course objectives tends to impart clearly stated goals which ultimately inspire and motivate students to give their best. This clarity in the course design tends to improve the perception of instructor's efficiency as well. Researchers (Marks, 2000; Marsh, 1991) showed that a more structured and organized course may lead to a favourable instructor assessment and self-evaluation. Effective programme organization tends to identify the relationship between concepts and course direction. An unstructured course will make students uncomfortable and without a focus and direction. Dissatisfaction in this regard will ultimately create a negative impression regarding the instructor's efficiency of teaching and the course. On the contrary a well-designed course will bring clarity, consistency and ultimate satisfaction for the students. The benefits of a clearly stated comprehensively designed programme organization and its impact on the pedagogical effect of the students tends to go a long way.

Research problem and purpose

In the present paper we have tried to address and elicit the views of the students of online courses from management institutes to understand the issues affecting the quality and the satisfaction of on-line courses, which can ultimately help in the designing and implementing of effective online courses in the long run. The flow of the paper is as follows: After introduction and review of literature, it will be followed by research methodology and research objective. Sample and data collection will be followed by findings and discussion. Conclusion of the study will be in the end.

Research questions

Which factors influence students' learning in an online distance education program?

Do students' perceived learning leads to satisfaction?

Does satisfaction with the online program directs loyalty?

Research objectives

The previous discussion presents a brief discussion on online delivery in education industry and emphasizes the need to enhance interface between technology and academia. For the purpose of this study, following research objectives were formulated in context of distance management education industry in India:

To analyse the factors affecting perceived learning regarding online delivery mode.

To determine the impact of perceived learning on satisfaction.

To establish the relationship between satisfaction and loyalty with respect to online delivery mode.

To study the correlation between various constructs in the model of the study.

Research methodology

The data for this study is based on students' experiences on online learning offered by two renowned distance education institutions in management in India. Generally, in distance education in India students are offered personal contact programmes (PCP) sessions offline at various study centres. In last few years, people in education industry believed that there is need for proper interface between technology and teachers and consequently many education challenges in India can be met through technology.

In order to make this online delivery effective, it is pertinent to understand how students' perceive learning through this mode and to what extent they are satisfied. This study seeks to understand students' perception of online delivery of distance education programme.

Sample and data collection

On the basis of literature related to measures affecting students' learning, we developed an initial version of questionnaire. Preliminary testing of this version was done with a few faculty members and students in a management institute and on the basis of feedback received few modifications in phrasing of statements were done. Final questionnaire was disseminated online through faculty members in two institutions which are involved in distance management education. Respondents were shared a link with free survey conducting portal www.google.com. Survey was administered near to end of delivery of courses. Respondents were instructed to provide their honest viewpoint about their experiences with online delivery mode. Finally, we received 214 complete questionnaires.

The questionnaire used for this study includes two sections. The first section is comprised of demographic details of respondents while the second section deals with various statements related to various aspects affecting students' learning, satisfaction, and loyalty. Total of 28 statements were drawn from relevant literature related to above mentioned constructs. Respondents were asked to provide their viewpoints on these statements on a 5 point Likert-scale running from 1 (strongly disagree) to 5 (strongly agree). Preliminary data screening was carried out for missing values and outliers, and the normality of the dataset was also tested. The authors analysed exploratory factor analysis for identification of key constructs. They analysed data of this study with SPSS 18.0 and AMOS 18.0. Further, structural equation modelling (SEM) was used as main analytical tool to analyse the cause and effect relation of the research model constructs.

Demographic profile of respondents was carried out, which indicated that sample comprised of 166 male and 48 female students. In term of age group, 87 respondents belong to less than 30 years age group while 123 and 28 belonging to 31 to 40 years and more than 40 years respectively.

Findings and discussions

Factors influencing students' perceived learning

This research used principle component analysis (PCA) with varimax rotation on 28 measurement items to screen them and identify the underlying dimensions of learning. We have checked data and found suitable for factor analysis in terms of vital parameters. The rule of minimum eigen value of 1.0 was applied. Only those items were selected whose factor loadings were at least .50 in PCA. Finally, 21 items were selected where factor loading was more than .50 in PCA. Out of these 21 items 2 items were related to satisfaction and loyalty. Data set was checked for suitability, we have examined the output of correlation analysis, variable-wise measure of sampling adequacy, KMO test of sampling adequacy and Bartlett′s test of sphericity (Boyd et al., 2002). Result are depicted in Table 1 and indicated that it was a fit case for application of factor analysis.

Table 1
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.932
Bartlett's Test of Sphericity	Approx. Chi-Square	3493.642
	df	300
	Sig.	.000

Rotated solution explains 70.226% of the variance associated with the students' online learning and comprised of five factors. Thus, exploratory factor analysis condensed 19 items into a five distinct group of statements. Each group was represented by one factor which was assigned a name, based on nature and wording of the statements.

Table 2
Output of Factor analysis

Factor (% variance)	Factor name	Items	Loadings	Cronbach's ά
F1 (24.032)	Perceived Learning	PL 1 PL 2 PL 3 PL 4 PL 5	.732 .796 .725 .687 .835	.749
F2 (14.563)	Student Interest	SI 1 SI 2 SI 3 SI 4	.601 .637 .696 .753	.834
F3 (12.317)	Pedagogical Effect	PE 1 PE 2 PE 3	.776 .809 .652	.793
F4 (11.471)	Programme organisation	PO 1 PO 2	.847 .693	.913
F5 (7.843)	Faculty Interaction	FI 1 FI 2 FI 3 FI 4 FI 5	.606 .715 .694 .730 .659	.873

First factor which explained 24.032% of variance is named as perceived learning. It comprised of five items namely developed a good understanding, good understanding of basic concepts of material, learned concepts and principles, learned to inter-relate topics, and gained knowledge. Each of these items was highly co-related with first factor 'perceived learning' and have high internal consistency (Cronbach's ά .749) as depicted in Table 2 (factor loading range from .725 to .835). Second factor explained 14.563% of variance and named as student interest. It consists of four items namely attentive in class, interested in learning, encouraged to learn, and perception of a course's intellectual challenge. All these items were highly co-related with student interest and were having good internal consistency (Cronbach's ά value .834). This factor is in line with other studies which emphasis on students' interest as important factor in creating a favourable environment and learning more (Marsh and Cooper, 1981; Tynjälä 1999). Third extracted factor was named as pedagogical effect and explained 12.317% of variance. It comprised of three highly co-related and reliable items related with methods of instructions were effective, good and useful. This is in sync with Mehanna's (2004) findings which describes that if pedagogy is employed properly in online classrooms it is likely to enhance students' learning and outcomes. Similarly Abrantes et al. (2007) stated that instructional methods used by teachers must be effective, useful, and satisfactory. Fourth factor was named as programme organisation and explained 11.471% of variance. This factor comprised of two items namely programme well organised and course material presented in an orderly manner. These items were highly consistence and co-related with fourth factor. This factor is in sync Feldman (1998) study which described educators' organization, clarity, and comprehensiveness as vital aspects in the student learning process. Last but not the least; fifth extracted factor was named as faculty interaction. This factor comprised of five items and explained 7.843 % of variance. Items included in this factor comprised of faculty eagerness to provide assistance, their availability, serving promptly, stimulated discussions and encouraged discussion. Internal consistency of these items was good (Cronbach's ά .873) and factor loading varied from .606 to .730. This is in line with other studies (Trentine, 2000; Flottemesch, 2000). Students tend to judge a distance education course according to their perception of the teacher's interactivity (Flottemesch, 2000).

These constructs were consequently subjected to confirmatory factor analysis (CFA) to examine the relationships amongst them. A completely standardised solution produced by Amos 18.0 using maximum likelihood method was taken. This confirmed the uni-dimensionality of the constructs and provided strong empirical verification of their validity. We have examined the goodness-fit of the measurement model for these factors using confirmatory factor analysis (CFA). Amos version 19 was used for the structural modelling analysis. As proposed by Garver and Mentzer (1999) the non-normed fit index (NNFI); the comparative fit index (CFI) and the root mean squared approximation of error (RMSEA) are calculated. As indicated in literature, the value of normally applied fit indices NNFI and CFI for good fit should be >0.90 and RMSEA should be <0.05. In addition, value $\chi 2$ statistic ($\chi 2$/ d.f. ratio) should be 3 or less.

In this research study, the model provides the good fit to the data with a Chi-square ($\chi 2$) = 742.5, d.f. =286, P= .000 ($p<.05$). $\chi 2$/ d.f. = 2.596 is satisfactory, as the value of $\chi 2$/ d.f. is less than 5 it is believed to be satisfactory to accept the model (Thomson, MacInnis, and Park, 2005). In addition to this, we have further calculated six other indices namely Goodness of Fit Index (GFI), Incremental Fit Index (IFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) to examine the model fit of the measurement model. The values of first five indices were found to be greater than .9 and RMSEA was .041. The study indicated CFI= .932, TLI= .917, NFI=.946, GFI=0.939, IFI=.944, thus all these values in our study meets typical cut-off criteria.

Structural model analysis

With the objective of examining the factors impacting perceived learning, a structural equation model was developed. The results are shown in Table 3 and in Figure 1, respectively.

Table 3
Structural model results (Regression Weights)

			Estimate	S.E.	C.R.	P	Label
Perceived Learning	<---	Faculty Interaction	.158	.039	4.073	***	par_15
Perceived Learning	<---	Student Interest	.481	.082	5.883	***	par_16
Perceived Learning	<---	Pedagogical Effect	.243	.047	5.132	***	par_17
Perceived Learning	<---	programme organisation	.382	.062	6.158	***	par_18
Satisfaction	<---	Perceived Learning	1.115	.128	8.676	***	par_19
FI 1	<---	Faculty Interaction	1.000				
FI 2	<---	Faculty Interaction	1.068	.099	10.753	***	par_1
FI 3	<---	Faculty Interaction	.931	.085	10.934	***	par_2
FI 4	<---	Faculty Interaction	.920	.094	9.816	***	par_3
FI 5	<---	Faculty Interaction	.929	.106	8.769	***	par_4
SI 1	<---	Student Interest	1.000				
SI 2	<---	Student Interest	1.314	.171	7.703	***	par_5
SI 3	<---	Student Interest	1.080	.152	7.093	***	par_6
SI 4	<---	Student Interest	.866	.144	6.002	***	par_7
PE 1	<---	Pedagogical Effect	1.000				
PE 2	<---	Pedagogical Effect	.715	.106	6.778	***	par_8
PE 3	<---	Pedagogical Effect	.965	.117	8.267	***	par_9
PO 1	<---	programme organisation	1.000				
PO 2	<---	programme organisation	1.422	.202	7.023	***	par_10
PL1	<---	Perceived Learning	1.000				
PL 2	<---	Perceived Learning	.902	.111	8.099	***	par_11
PL 3	<---	Perceived Learning	.941	.116	8.124	***	par_12
PL 4	<---	Perceived Learning	.939	.129	7.263	***	par_13
PL 5	<---	Perceived Learning	1.061	.122	8.662	***	par_14
loyalty	<---	Satisfaction	.891	.059	15.143	***	par_20

The results of this study indicate that there is a positive and significant effect of student interest, faculty interaction, programme organisation, pedagogical effect on perceived learning. Further, perceived learning is associated with satisfaction, as these two constructs are also positively and significantly related. Satisfaction leads to loyalty which was measured by positive recommendation of programme to others. This association was also positive and significant.

Further, in order to evaluate relative contributions of each predictable variable of perceived learning, we have used Standardized regression weights as depicted in Table 4.

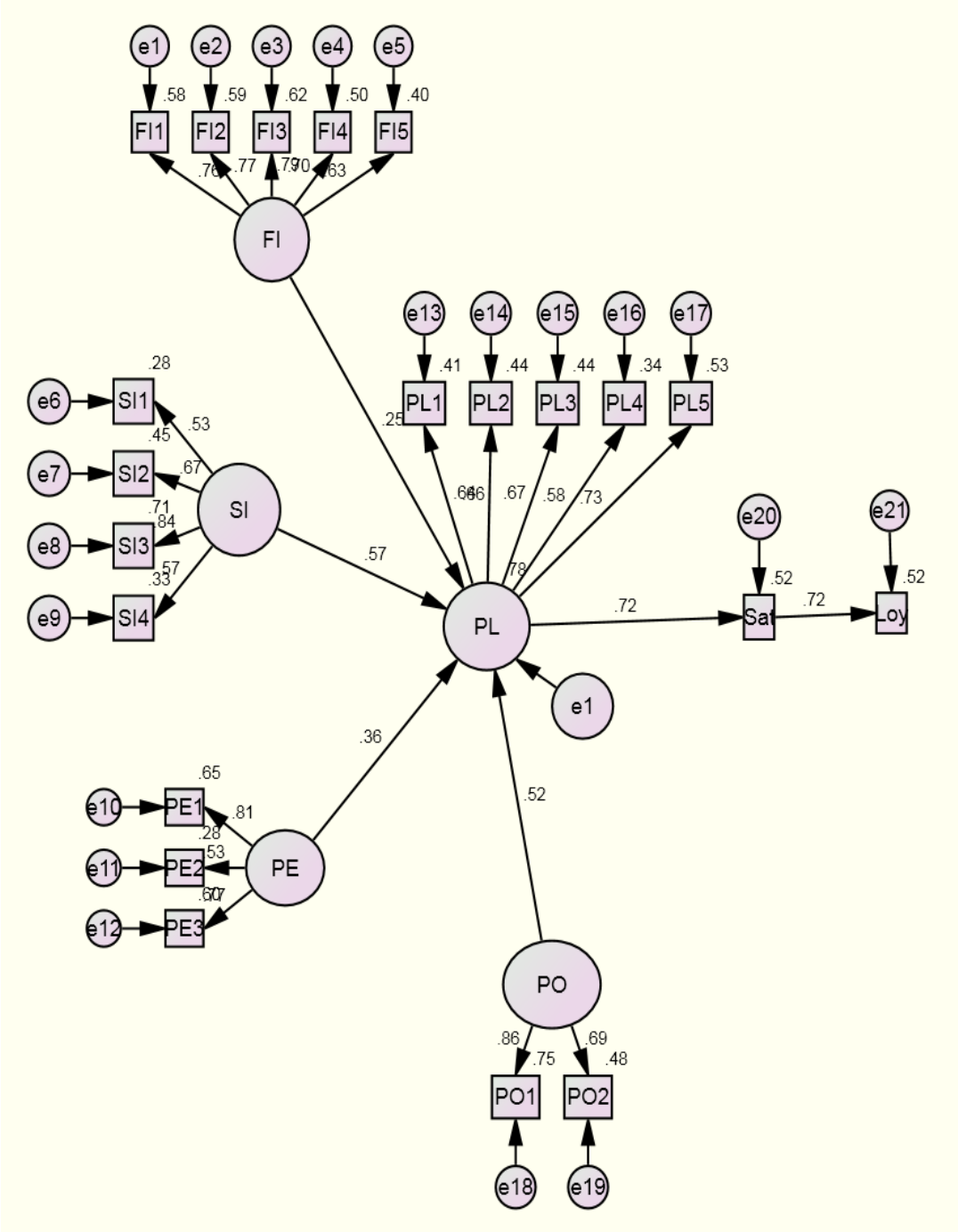

Figure 1. Structural equation model

As shown in Fig 1, the factors having influence on perceived learning in decreasing orders of contributions are student interest (.566), programme organisation (.516), pedagogical effect (.364) and faculty interaction (.253). The result of this study are in line with other studies which indicated positive association of student interest (primary influence) and pedagogical effect with perceived learning (Abrantes et al. 2007). Similarly, Centra and Gobetz (2005) indicated that student learning is highly influenced by the effort put by them, while a faculty can do much to facilitate learning but eventually students themselves must take some responsibility for their learning in a course.

Table 4
Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Perceived Learning	<---	Faculty Interaction	.253
Perceived Learning	<---	Student Interest	.566
Perceived Learning	<---	Pedagogical Effect	.364
Perceived Learning	<---	programme organisation	.516
Satisfaction	<---	Perceived Learning	.722
FI 1	<---	Faculty Interaction	.761
FI 2	<---	Faculty Interaction	.771
FI 3	<---	Faculty Interaction	.786
FI 4	<---	Faculty Interaction	.704
FI 5	<---	Faculty Interaction	.633
SI 1	<---	Student Interest	.573
SI 2	<---	Student Interest	.842
SI 3	<---	Student Interest	.673
SI 4	<---	Student Interest	.528
PE 1	<---	Pedagogical Effect	.775
PE 2	<---	Pedagogical Effect	.534
PE 3	<---	Pedagogical Effect	.809
PO 1	<---	programme organisation	.692
PO 2	<---	programme organisation	.864
PL 1	<---	Perceived Learning	.644
PL 2	<---	Perceived Learning	.663
PL 3	<---	Perceived Learning	.665
PL 4	<---	Perceived Learning	.581
PL5	<---	Perceived Learning	.725
loyalty	<---	Satisfaction	.724

Conclusion

In today's educational scenario to adopt online learning as a viable tool for education among students is one of the imminent challenges faced by the educational institutes. It is essential to design and implement effective virtual education infrastructure along with a well-designed and interactive pedagogical system.

Literature review and the results of the study show that on line course effectiveness lies in having a positive influence on perceived learning keeping in mind the students' interest, programme organisation, pedagogical effect and faculty interaction. These findings provide valuable guidelines for the online teachers and college administrators. Learnings from this study will assist in capturing the crux of good teaching. First, as we can see from the result of this study the teachers' play an important role in keeping students engaged with interactive, responsive and

engaging sessions. Teachers need to be knowledgeable, having command over the taught subjects and humane to gain the respect of the students. Second, well-structured and meticulously planned course organization plays a significant role in online teaching and learning, where taking constant inputs from peers is not convenient. Organized and ingenious programme organization leaves a significant impact on perceived learning of the students. Meticulously designed course content plays a crucial role in creating students' perceived usefulness and contentment with the online courses. This study tends to provide insightful and meaningful information to those institutions that are keen to implement online learning from a teachers and learners' perspective. On line learning is able to make a special impact in higher education in 21st century thanks to the flexibility and enriching experience which it intends to provide.

Limitations and scope of future research:

Although this research epitomises a wide systemic effort to include elements of online learning, it is not without limitations. First this work focuses only on the learning experience of students from two management institutes, which tends to affect the achieved results. The scope of this study need to be further broadened with inputs from various streams of education to have an understanding from a wider perspective. Second, profiles of respondents in this study were comprised of 166 male and 48 female students, which were quite uneven in their numbers. Hence it is difficult to make any conclusive finding based on the generation based differences to exist in online learning course. Therefore extended research is desirable on a larger sample with a balanced gender based sample. A comparative study on the developing and developed countries' readiness on the effective online learning module can be also taken up as a scope for future research.

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Editor's Note: Social media is finding uses in educational environments as a readily accessible communication medium to engage students and support learning activities. This study points to strengths and weaknesses discovered so far in one cultural setting based on student experiences with educational interventions and level of involvement in social media.

The effect of using Twitter as a co-environment in University of Tabuk (Case Study)

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Abstract:

This paper is a report on the findings of a case study conducted on using Twitter as a co-environment in University of Tabuk. Social media has become a widespread phenomenon and an integral part of social communication in the recent decade. It has penetrated other spheres bringing its benefits to higher education. Twitter is one of the most popular social media resources that is being adopted by many universities and faculty members around the world. Twitter is a supportive environment to communicate with the students rapidly and continuously. Its potential in the classroom is to stimulate and engage students in the educational process, assist communication between instructors and students, foster adoption of informal ways of learning, help students to be more prepared for the future employment, and create a platform for participation of students who are shy to express themselves in class. Social media can improve student learning by enhancing engagement, participation, and communication. Many educational institutions introduce the social media tools in the classroom in to improve engagement of the students. In order to determine the impact of Twitter in University of Tabuk, it is necessary to review the variety of its effects in depth.

Introduction

Social media has become a widespread phenomenon and an integral part of social communication in the recent decade. It has penetrated and brought benefits to other spheres including higher education. Twitter, as one of the most popular social media resources is also advantageous for the higher education, introducing its potential in the classroom. This social media tool can be utilized to stimulate the engagement of students in the educational process, assist in communication between instructors and students, foster informal ways of learning, help students to prepare for the future employment, create a platform for participation of students who are too shy to express themselves in class, and even improve the grades of students through the enhanced engagement, participation, and communication.

On the other hand, Twitter can also have a negative effect on the students. Among the possible drawbacks of involving Twitter in education is the negative effect on formal writing that is produced by excessive texting, increasing dependence on informational technologies, which aggravates essential writing skills, and stimulation of writing and thinking in short sentences that lack depth. Among the minor negative effects, there is the potential threat of cyberbullying of some students or discouragement of the face-to-face communication. Thus, Twitter is considered to be a highly potential tool for the higher education, which is beneficial in the variety of applications, but it still displays some downsides, such as a negative effect on writing skills, so the medium ground should be reached in its educational application.

The role of the social media resources in education has been the focus of the on-going debate for the recent decade. There are different serious arguments expressed from the both sides, supporting the advantages and disadvantages of social media utilization in the classroom. Attempt to avoid the social media in education is to some extent effortless nowadays given the increasing

popularity of the social media platforms not only among the young people but among adults as well. That is why many educational institutions tend to introduce the social media tools in the classroom in order to improve engagement of the students. In order to determine the impact of Twitter in the modern higher education, it is necessary to review the variety of its effects in depth.

Literature Review

Benefits of Twitter

Nowadays the social media is deemed important for the higher education because of the occurring changes in modern students, who are much more dependent on the Internet in general and on the social networking in particular. One of the most appealing characteristics of the social media is its openness and the "bottom-up" approach, which allows sharing, exchange of data, and personalizing of all information (Selwyn, 2012). For the today's students using social media, for instance, Twitter in education is not a part of a modernization of education, but a natural process that supplements their everyday activities. The absence of integration of the modern technologies in education can be experienced as a limitation of the students` average way of perceiving information and interaction.

As a potential educational tool, Twitter has its own specific features like the possibility to exchange messages, write microblogs, connect people, conduct Twitter seminars, and enhance reciprocity (Rich & Miah, 2013). Consequently, there are numerous possible implementations of Twitter in the higher education. The most considerable advantages of Twitter in the higher education are to be reviewed below.

Reciprocity in ommunication

The accepted form of studying is conducting lectures with the limited opportunity for students to express their thoughts and to pose questions. Microblogging in Twitter enables students to communicate with their professors and among themselves online. Moreover, with Twitter, there is created a platform for uniting students by the topics of interest. Students are provided with an opportunity not to be passive learners and only perceives of information, but to critically evaluate the material and to express their thoughts by the means of the social media platform Twitter.

It can be claimed that Twitter does not suit the academic world due to its freedom of expression and abundance of excessive information. Priego (2011) instead suggests that academic workers are capable of managing the flow of information and that this ability is suitable for Twitter. This feature is also highly beneficial for students who have to be able to filter the information they read, especially if to consider that students from the future academic elite and skills of research and data processing have to be developed from the classroom. Twitter can assist the skilled learners and educators to listen to the other members of the academic world, such as their peers or other target audiences (Priego, 2011). As a result, Twitter can be a method of connection and reciprocity not simply in the educational process, but also in the academic and scientific research. Also, the flexibility of Twitter offer to more abilities to commitment and enhance students' perceptions of a feeling the social presence that help them to encourage their involvement (Al-Khalifa, 2010).

Engagement in the studying process

Twitter is also recognized as a powerful tool for improvement of the students` engagement in the studying process. An experienced educator today realizes the need for additional methods for leveraging the engagement of students. Social media tool Twitter provides a unique opportunity to improve engagement without the special efforts of the teacher. It is the tool that is used by the majority of students in their interactions, and its penetration into education should be seen as natural. What is more, Twitter also supports engagement in the academic work, because with a

publication of an article or a research engagement with the audience only begins and needs to be supported.

Twitter may facilitate engagement in the work of a group, for example, students can send their questions or comments in the form of tweets (Grosseck & Holotescu, 2008). The classroom activities can be discussed by the means of Twitter, enhancing engagement in the working process and explaining the material additionally. This social media can improve engagement in the common projects, require collaboration of students in the common work. It is often challenging to gather the members of the project group together out of the school facilities, and Twitter can be an efficient platform for such gathering. According to Al-Khalifa (2010) Twitter enhancing students to participate in a massive discussion through, follow experts, interactions through private messages and mentions in the Twitter accounts and hashtags to engaging in learning processes.

Improvement of grades

With the improved engagement, discussion, and communication of the students' improvement of practical results is a natural outcome. However, in order to take the biggest advantage of the social media platform, it is necessary that the faculty members have a predisposition to using innovative informational tools (Crook, 2008). For the modern US students communication through the social media platforms is an integral part of their daily activities, often assisting in education (Cotton, 2008). When students face the favorable attitude of the teachers in the involvement of social media tools, their engagement levels are prone to increase in response.

The experiment, conducted by Junco, Heiberger, and Loken (2010) proves that integration of Twitter into the work of students, teachers, and faculty results in significant improvement of students' engagement in studies and also leads to higher average grades of involved students. The experiment, undertaken in 2010, involved 125 students, 70 of whom were in the experimental group and the other 55 in the control group. The students in the experimental group received consultation about the work and specialty of microblogging in Twitter in the beginning of the semester. During the experiment, which was continuously held during one semester, students participated in the following activities by the means of Twitter (Junco, Heiberger, and Loken, 2010, p. 4):

- Class discussions, which were conducted only once a week, were continued in Twitter.
- Students were given an opportunity to ask questions in a low-stress manner.
- Book discussions were performed in the network.
- Students received class and campus event reminders.
- Regular connections among students and with instructors were established.
- Twitter was used for organization of work in several directions: volunteering groups, learning activities, support in academic pursuit, and personal assistance.

The experiment proved the hypothesis about the increasing engagement in the educational activities when Twitter is used. It was measured with the help of analysis of variance (ANOVA) model, and it was verified that engagement significantly increased in the experimental group. So, it can be concluded that Twitter is a relevant tool for improvement of the students' engagement in studying. Then, the hypothesis about the improvement of grades was also supported in the course of the experiment. The mean GPA for the semester was 2.79 in the experimental group and 2.28 in the control group. Consequently, the direct connection between using Twitter appropriately as an educational tool and improvement of students' grades is noted, proving that this social media is beneficial for higher education.

Preparation for the future employment

Ability to interact with the social media has become today not only the part of the daily communication but also an integral part of numerous jobs. With the growing integration of the technologies into daily lives and jobs, it is clear that the role of social media will only increase with the time. As a result, skills of networking and social media managing will be the part of job responsibilities in various spheres. So, teaching students to utilize the social media platforms with a special target can be highly beneficial for their job preparation (Nichols, 2013). Moreover, skills of Twitter usage, as well as of the other social media, can be highly advantageous for the job search (Lederer, 2012).

In the academic world, social media engagement also serves as a beneficial supporting tool for engagement of audiences. With a development of the informational technologies and their deep integration into social life, the importance of platforms like Twitter can become crucial. Thus, it is important to prepare the students, as the future researchers and professors, to using the social media with a particularly useful purpose.

Possible harmful effect of Twitter

As every technology, social media is only a tool that needs to be rightfully applied in order to deliver a proper result. Despite its numerous appealing features, Twitter also has a variety of implications, while some of them are negative for students. Firstly, communication in Twitter involves texting; furthermore, text messages in this social media resource are limited to 140 characters. The limited nature of the messages stimulates young people to use the shortened variants of the common words, for example, “plz” for please or “u” for you (Friess, 2003). Another reason for the invention of the shortened versions of words is the small size of the keyboard on the cellphones, which are used for the communication and for Twitter in particular. Consequently, the knowledge of the grammar, syntax, punctuation and other important language rules is affected when students are involved in social media too frequently. However, it should be taken into consideration that the fact of using social media tools does not influence language skills, but it is a personal choice and habit of every student how to write a message and how to develop a sentence.

Another outcome is in a limited ability to express long thoughts, resulting in problems with writing college essays. Twitter allows its users to write only 140-character short messages and frequent utilization of this tool stimulates a habit to express the thoughts in the small tweets rather than in long developed sentences. Some researches prove a direct relation between intensive usage of social media tools and writing skills, for instance in the case study of The University of Alabama (2009) it is illustrated that reduction of online texting positively influences formal writing skills and vice versa. Thus, it is presumed that integration of Twitter into the educational process would stimulate students to text more than average and as a result would have a negative effect on their writing.

There are also other negative implications of using Twitter intensively with the educational purpose. Online resources provide different opportunities of automatic checking of grammar and spelling, and this detrimentally affects the writing skills of students. According to Bloxham (2010), 58 percent of educators claim that cellphones and other electronic devices with an opportunity to engage in networking are responsible for the spelling problems of the modern generation. The correct spelling is disregarded by young people who communicate online because on the one hand they can use a lot of different shortcuts and on the other hand their applications correct spelling upon need automatically.

Twitter as an educational tool can be especially time-consuming because it is required to check the profile regularly in order to be engaged. It was claimed that online discussion is beneficial, but it also has a drawback: due to the 140-character limit a response in Twitter is substantially

shorter than it can be done in a regular form. Moreover, usage of social media tools is addictive as it is considered by the modern educators (Bloxham, 2010); consequently, additional exposure to using social media like Twitter can be disadvantageous. Twitter can also have a highly distracting effect on the students if they use this tool during the classroom activities.

The study

This study is a qualitative case study, According to Yin that, a case study is used to "examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods" (Yin, 2013, p. 23). This case study described undergraduate students' perceptions among using Twitter as an educational tool at University of Tabuk. It focuses on the effect of using Twitter as a co- environment in University of Tabuk and finds the process and results that students achieved though used Twitter during the semester. This case study design is an instrumental case study to find and analyzed the students' understanding of using Twitter in learning, how they use it? why they us it? and how effective they find it in their learning process. Johnson and Christensen (2014) said, "The instrumental case study is popular with many academic researchers when they are interested in generalizing and extending the findings in research literatures on various topics" (p. 436).

Students written a tweet daily through the weekdays and through the open days of the university, they were required to write 5 tweets weekly with two conditions: a) write a tweet daily b) two of the tweets should be a retweet from an expert in the same field, which is the tweets must be in different days. In addition, students at the end of the semester need to submit a reflection paper about their experiences and their thought of this experiment. This study applied in the Fall of 2014, participants engaged in the course's hashtag in Twitter from September of 2014 through December of 2015.

Participants and contexts

The participants in this case study were male undergraduate students, who were registered in course Communication Skills. Communication skills course is a required course for all students who enrolled in University of Tabuk, freshmen students take this course as an entering course in their first year. The average age of participants was 19 years old, Students in this course met face-to-face twice weekly during the semester for one hour.

During the semester, participants participated on the course's hashtag in Twitter, #COM_UT, for fourteen weeks. Each participant posted at least 5 tweets weekly on the course hashtag. This case study was drawn from two classes where students had taken the same course. Students came from different majors. This study was initiated at a University of Tabuk at the main campus located in Tabuk at the northern-west region in Saudi Arabia.

Procedures

At the beginning of the semester, students have been asked about who has a Twitter account and I was shocked when most of the students did not have an email nor that they have not a Twitter account. The ways of this study involved run in the following steps: First, the first week was to help students to create their Twitter account, then a course hashtag created, policies and rules of using the hashtag implemented in the course during the semester. Second, the students were required to write reflection papers at the end of the semester about their experience and the what they learn and achieved from using Twitter as a co-education environment and attached some of their tweets. The reflection papers were analyzed. The average length of the reflection paper was between 2 to 3 pages. Third, an online survey questionnaire was administered at the end of the semester to examine their experiences of using Twitter.

All participants tweeted to course Twitter hashtag for 14 weeks and submitted a reflection paper, data was analyzed data (written reflection, tweets). Written reflection papers and tweets were evaluated using the document analysis technique. Students' reflection papers and tweets were categorized into groups based on themes, identifying similar phrases, patterns, relationships, and commonalities in relation to the course syllabus, and contents.

Role of the Researcher

At the time of this study, I had two roles; the first role was an instructor to teach the course to the students in class, and the second role was a facilitator of the course's hashtag, students' tweets, and students activate in the course's hashtag. The first role was during the face-to-face meeting for the course during the semester, and the second role started after the course hashtag created, then help students who did not have a Twitter account to have an account, gave general information about Twitter, and explain how to use Twitter and its hashtag for the course. grades were assigned for tweets as part of the final grade a grade that would count towards the course final grade. I had monitored the course hashtag at Twitter twice daily for 14 weeks on noon and midnight to ensure active participation of students, and quality of contents posted, and sometimes I wrote tweets as gaudiness and assist for students. The course participants were asked to post complete and meaningful tweets related to the course content instead of shortened text messages.

Findings

Themes emerged from the student written responses

At the beginning of the semester, using Twitter as a co-environment in the course the majority of the course participants did not have an email nor than a Twitter account, and they did not agree with using Twitter as a required activity throughout the course. The first week was for signing up to Twitter and try using the course hashtag. In addition, participants at the first class in the second week shared their first experience of setting up an account for Twitter, what to post, how often to post, and how it works overall.

The majority of participants in this study expressed their experience of using Twitter in this course, they were not considering the value of Twitter as a classroom tool until they participated in the course hashtag

Change in the perceptions

Participants were surprised to use Twitter in the course. At first, they expressed uneasy feelings about signing up for a course hashtag at Twitter, and tweeting the information and the knowledge they learn in the class, participants divided to 4 categorize according to their tweets and reflection papers; the first group refused to patriciate, and after their complaint denied they started to post tweets, but not effective tweets; the second group was having Twitter account and they started to use it for education purposes; the third group did not use Twitter before and they enrolled in the hashtag; and the fourth group was using another social media tool, Facebook.

Faisal Albalawi, a freshmen student enrolled in this course, he wrote about his experience in the reflection paper, how his perceptions of using Twitter changed over the course: I did not have an account on twitter until it became required to this course, I thought in the beginning, finding a tweet and retweet it will be easier, but looking for tweets related to our course’s contents were not that easy. I follow some experts to retweet their tweets, I enjoyed read their tweets, and these tweets helped me to develop my personal skills. Twitter was a great way for me to find new knowledge and current news related to my study, he closed his reflection paper with this statement, I never thought that I would ever use Twitter, I did not think I could use it in education and to learn and to develop my skills, but now I am glad that I learned how to use it perfectly, and in effect way.

Ali Humadi, is another participant in the course, and used the course's hashtag, he expressed his discomfort with using Twitter initially and how it became a useful tool later: When I first found out that the course had a Twitter hashtag that is required to comment on once daily at the weekdays, I will admit that I thought it was a waste of my time and I did not imagine the benefits of that. I had a Twitter account, but I use it to follow sports accounts and to find news immediately. Even I am a Twitter used, but for me, it was an extra headache and beginning of the course. I was strongly against having a Twitter account prior to this course. As the course, has progressed, I have come to love the course Twitter hashtag, and after this course, I started to follow some of the famous people in Tweeter whom interested in human developing all around the world.

Mohammad Alqahtani, another student in this course, and he was one of the higher participants in the course's hashtag, in his reflection paper, he wrote I had never used Twitter before this course. I had a hard time in the beginning to post a tweet, I am a Facebook user, and on Facebook, there is no limit of works neither in the letters, thus the character count is limited to 140 characters per tweet drove me crazy. Also, I found it a little difficult to use and would miss tweets and re-tweets from people. I think that creating a course Facebook page would be a better way than Twitter, but after the instructor explain to us how Twitter more global, and the tweets will be available for all, and the limitation of following is open not like Facebook limited, I accept the point and found it more effective, and during the semester, and according to the instructor's roles to write the idea in one tweet, I because better to summarize my idea, focusing on the main point, and post it in a one tweet.

Discussion

This study presented the perspectives of undergraduate students' experiences of using Twitter as a co-educational environment for fourteen weeks as a required social media activity in the class. Most of the participants reported that they used Twitter for the first time in their life, and all of them sad it is the first time to use Twitter as an educational tool in their whole learning period. Participants at the end of the semester reported their experiences of engaging in the class hashtag, course announcements, and other required activities during the semester based on using Twitter as an educational tool.

At the begging of the semester, participants were surprised to use Twitter in the class. At first, they expressed unexciting feelings about using Twitter, create an account, tweet for a course hashtag at Twitter the participated of the course hashtag was not effective, some of the students refuse to use Twitter and tried to did not participate, but after they find who participated started gain grades and became more active in the class, they changed their mind and enroll in activities, especially when the preparatory year deanship refused to accept their complaint, which helps to raise the participation on the course hashtag at Twitter. During the semester, the value of tweets became more significate and participants in their reflection paper

Overall, participants reported that Twitter fostered a knowledge and pointed their point directly. However, participants shared various personal reasons for why it was a challenge for them to use Twitter in the course, some of them related to their limitation of using Twitter, and some of them they denied to do additional work, and ranging from limited knowledge of Twitter to uninterested users who did not see its wider application in academia.

The experiences of students and instructors varied while using Twitter. Participants not only reported challenges while using Twitter but also expressed an interest in future endeavors. However, the factors such as "age of students, number of students, and nature of classroom setting and technological knowledge of students can be some of the variables that the [instructor] has to consider while using Twitter in the classroom" (Bista, 2014, p. 145). In addition, using

Twitter could not change the straight academic knowledge practices, but it positively invites students to participate in the learning process (Bista, 2014). Overall, the findings from the current study suggest Twitter is a useful tool to enhance the social presence of students and to develop their humanity skills and make them critical thinker to meet their point.

Conclusion

To conclude Twitter as a social media resource possesses a lot of beneficial features and thus can serve as an important educational tool. It has numerous advantages such as improvement of students' engagement in studying, improvement of the grades, preparation to further employment, being a platform for expression and for organizing educational events. However, application of Twitter in higher education is not beyond criticism as it can deliver its disadvantages along with the benefits as well. Among the negative consequences of excessive use of Twitter, there is a habit of expression thoughts in short messages and deterioration of writing skills including grammar, punctuation, and spelling. If to compare the benefits and the downsides of Twitter it can be concluded that the advantages outweigh the disadvantages, and it is beneficial to use this tool in education, but this integration should be limited. The middle ground in utilizing social media resources like Twitter should be found in order to strike the right balance between the benefits and downsides and deliver the best effect for education.

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Editor'sNote: This paper documents experience in transitioning to iPads in a teacher training program.

iPad integration experience

Kelly McKenna
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Abstract

This narrative study documents the experience of a first time pilot program integrating iPads into teacher preparation courses at a teaching intensive university in the Rocky Mountain Region. Presented as an autoethnography, running records of the researcher's experiences were explored. The researcher's experiences were compared to the experiences of other instructors participating in the pilot program with varying degrees of iPad expertise, through a questionnaire containing open-ended questions detailing: successes, difficulties, preparation and the time commitment required to effectively incorporate iPads into existing curriculum. This research may assist in providing insight to other educators following a similar path towards technology integration and may provide information on enacting a 1:1 iPad initiative.

Keywords: technology enhanced teaching and learning, higher education, technology integration, 1:1 initiatives, pre-service teachers

iPad integration experience

Today's learners are digital natives and in order to generate their highest potential, technology needs to be effectively integrated into their learning. In 2001 the U.S. Department of Education ratified the Enhancing Education through Technology Act, with the primary goal requiring the integration of technology into elementary and secondary education to improve student academic achievement. In order to effectively integrate technology into K-12 education, current teachers need to be educated on effective integration practices and pre-service teachers need to be trained to effectively utilize the technology available to them. To meet learners where they are, educators must discontinue the use of outdated teaching methods and materials and embrace a digital world (Rossing, 2012). For many teachers this is an intimidating prospect; the ability to effectively integrate technology into the existing structure of teaching is no easy task. Unfortunately, teachers have limited access to examples of effective technology integration as models to pattern their teaching (Bitner & Bitner, 2002). However, teachers are the key to effective technology integration; in order to transform their teaching paradigms it is imperative they learn how to use technology (Bitner & Bitner, 2002). Instructing pre-service teachers on effective technology integration can lead to teacher buy-in and the establishment of technology enriched curriculum (Hogue, 2013).

This narrative study documented instructors' experiences with an iPad integration pilot program intended to provide a vision for implementing a 1:1 initiative at a teaching intensive university in the Rocky Mountain Region. The pilot program took place in the classrooms of four instructors who had varying degrees of iPad skills. The study was comprised of a running record highlighting the researcher's experience of integrating iPads into an educational technology class for pre-service teachers. It included a comparative element examining the experiences of all four instructors who taught the class and participated in the initiative. All four instructors completed a questionnaire detailing: successes, difficulties, preparation, and the time commitment required to effectively incorporate iPads into existing curriculum.

Literature review

Technology integration

Technology integration in education refers to the utilization of technology to promote teaching and learning. Integrating technology into learning that is embraced by, and relevant to, today's learners' everyday lives has the potential to revolutionize formal education (Peluso, 2012). By meeting students where they are in respect to technology, we can create more learner centered instruction, solving the challenges of students' needs and desires to learn differently (McCaffrey, 2011). The inclusion of technology in teaching and learning modifies the current teaching paradigm and empowers students through hands on learning. By integrating technology into pedagogy, educators can engage students like never before and cultivate deep, meaningful learning (McCaffery, 2011). When mobile devices are integrated into education it allows students to continue learning beyond the end of the school day (Hill, 2011). Students then have the ability to continue gathering information and gaining knowledge outside of school, utilizing the devices that are a part of their everyday lives. Through the utilization of technology in teaching and learning, today's learners have the potential to exceed what was possibile for previous generations (McCaffrey, 2011).

Technology challenges

Often the technology infrastructure and support in schools areis not adequate for integration especially on a 1:1 basis. Lacks of adequate technology support and device management are consistently concerns when integrating technology (Chientzu, Block, & Jesness, 2012). In addition, school firewalls and filters often cause frustration for students and teachers, limiting access to available resources for teaching and learning (Hill, 2011). The cost of educational tools also limits teacher's ability to be creative in utilizing free technology in their instruction.

Teaching with technology

Hogue (2013) stated that technology, time, individual beliefs, organizational structures, and evaluation are crucial to successful technology adoption by educators. Teachers are often not familiar with how to effectively incorporate technology into their teaching and attempt to do so without a clear perception of the learning possibilities with integration (Peluso, 2012). Technology integration training and professional development opportunities demonstrating sound pedagogy and technology enhanced teaching practices need to be offered to educators (Chientzu et al., 2012). For educators to integrate technology they must first perceive it as both useful and easy to use (Hogue, 2013). When training on technology, the focus should be on utilizing it to complete activities already valued and achievable without the technology, as this requires less of a shift in beliefs (Hogue, 2013). Teachers can be encouraged to integrate technology into their pedagogy by witnessing how their peers are incorporating tools and applying technology (Hogue, 2013).

Technology initiatives

There are numerous options available to educators when determining they want to employ a technology initiative in their class: bring your own device/technology (BYOD/T), cart systems, and 1:1 are a few of the possibilities. In a BYOD/T system every student has access to a mobile device that they will utilize for technology enriched lessons. The device may be a smart phone, tablet, iPad etc., and is typically owned by the student, but may be provided by the institution (Hill, 2011). Cart systems make a single type of device available to students during class time. They are provided by the institution for student utilization in class and are then available to a different set of students in the next class. In a 1:1 initiative every student is given a device for which they are then responsible. iPads are commonly the devices employed in 1:1 initiatives, but other brand tablets and laptops are also possibilities. In 1:1 initiatives every student has the same device and it is solely for the student's use and accessible to them at all times.

In a BYOD/T setting there are challenges associated with all the students utilizing different technology (Hill, 2011). It requires teachers to be experts on a variety of devices and to ensure that the tools they employ are available on all platforms. Furthermore, BYOD/T necessitates additional coordination that is not required when all learners are utilizing the same device (Hill, 2011). The use of a cart system solves this problem; however, it causes a device that was developed as a 1:1 tool to be shared by multiple students (Chientzu et al., 2012). Students no longer have access to the device outside of class, so the opportunity for learning is once again limited to class time. When 1:1 initiatives are implemented, instructors are able to differentiate learning more efficiently because all students are utilizing the same device and are able to extend their learning beyond the school day (Chientzu et al., 2012). The devices can be personalized for improved and individualized instruction and are being utilized for the purpose for which they were developed (Chientzu et al., 2012). 1:1 iPad initiatives allow students greater control of their learning and the opportunity to adjust tools according to their abilities (Chientzu et al., 2012).

iPad programs

iPad programs are being implemented in classes starting in kindergarten and continuing through higher education. Schools and districts at the forefront of technology integration are providing students with iPads to extend education in elementary schools, middle schools, high schools and at the college level in the United States and abroad (Chientzu et al., 2012; Conn, 2012; Faris & Selber, 2013; Gitsaki, Robby, Priest, Hamdan, & Ben-Chabane, 2013; Rossing, 2012; Wakefield & Smith, 2012). Research in a variety of grade levels and content areas can be found supporting technology enhanced teaching practices and the positive impact on student achievement (Chientzu et al., 2012). However, the only record of iPad use in an education course in higher education was from an undergraduate multicultural education course at Texas A&M (Wakefield & Smith, 2012). The professor's intent regarding integration was for students to utilize the iPad to search for information on the internet and to complete assignments via the distributed iPads (Wakefield & Smith, 2012). The goal of the research was to shift the class from teacher-centered to a student-centered collaborative model for learning (Wakefield & Smith, 2012). No research could be found concerning iPad integration into teacher education courses for the purposes of preparing future educators to effectively integrate technology.

Technology education is a requisite for today's learners to be prepared for leadership in a digital world. But, in spite of the Department of Education's mandate to integrate technology into K-12 education and the International Society for Technology in Education's (ISTE) emphasis on infiltrating teacher preparation programs in order to accomplish effective incorporation of technology into teaching and learning (ISTE, n.d.), teacher education continues to be overlooked (Bitner & Bitner, 2002). Although pre-service teachers may be comfortable working with technology, they are often not taught how to integrate it into their pedagogy. Educators know teachers teach how they were taught, but often the model being portrayed to pre-service teachers does not include integrating technology into instruction (Rosenfeld & Martinez-Pons, 2005). Rosenfeld and Martinez-Pons posit that teacher education programs often "focus on how to use technology rather than on how to teach with technology and integrate it into everyday teaching" (2005, p. 146). Effective pre-service teaching prototypes of technology integration need to be modeled in order to succeed in achieving successful implementation in K-12 education.

Research questions

What were the visions for implementing a 1:1 iPad initiative?

What were the perceptions of the iPad pilot program?

What successes and challenges were encountered when integrating iPads into teaching and learning through the iPad pilot program?

To effectively integrate iPads into teaching and learning through the iPad pilot program, what preparation and time commitment were required?

Methodology

Narrative

Narratives assist in discovering the identities of the individuals involved and, according to Creswell (2013), narrative research focuses on one or two individuals and "begins with the experiences as expressed in lived and told stories" (p. 70). This research utilized an autoethnographic approach. This was warranted because the intent of the study was to share one educator's experiences as she attempted to integrate iPads into the curriculum utilizing an iPad cart system. It is a first-hand account of teaching and learning containing the personal experience of the researcher. Creswell includes autoethnography as one approach to the narrative research method of qualitative inquiry, in which the research is documented by one of the research participants. Stories were incorporated detailing the training, challenges, successes, impact, and knowledge of the instructor that assisted in iPad integration. In addition to the autoethnography, questionnaires were completed by all four instructors of Educational Technology (ET) 449, Integrating Technology in Secondary Pedagogy. This questionnaire provided a comparative element. The instructors of ET449 were surveyed regarding previous experiences with iPads, as well as their experiences of implementing the iPad for this course. The results from the research were utilized in formulating a vision for future implementation at this institution. The study took place at a specific location, a teaching intensive university in the Rocky Mountain Region, which is one of Creswell's narrative research traits. This is an important aspect of the research, as an instructor teaching at a differing level, geographic location, or possibly in varying content area, may encounter a different experience.

Participants

Participants in this qualitative study were instructors of ET449, Integration of Technology in Secondary Pedagogy. The researcher completed journaling throughout the course of the study. The three other instructors, also teaching ET449, were utilized for completion of the comparison aspect.

Setting

The research took place at a teaching intensive university in the Rocky Mountain Region. ET449 is the only face-to-face undergraduate educational technology course offered at the institution. Three sections of this class were offered for pre-service teachers and all three sections were included in the iPad pilot program. ET449 is a required class for the majority of students completing their teacher certification program in secondary education at this university.

Data collection

Autoethnography. A running record of the researcher's experiences were recorded detailing the iPad integration experience. This was accomplished through reflective journaling by the researcher at any time throughout the process.

Comparison. A questionnaire was completed by all the ET449 instructors to compare the pilot program for each individual. All instructors answered open-ended questions regarding the successes, difficulties, preparation, and time commitment associated with incorporating iPads into existing curriculum.

Analysis

The qualitative data collected was analyzed and coded. The analysis was an iterative process through which reoccurring patterns in the data emerged. The data was reviewed and themes determined. The themes from the open-ended questions were examined and compared to analyze

similarities and differences in the instructors' iPad integration experiences. According to Rose (2001) the coding categories for the content analysis must be "exhaustive, exclusive and enlightening" (p. 91). Credibility issues were addressed by using expert/peer checks, triangulation and a collaborative mode of research (Merriam, 1998). The incorporation of multiple methods of data collection for comparison bolsters the internal validity and reliability of the research (Merriam, 1998). Analysis of the data showed the findings made sense through consistency and dependability, thus strengthening the reliability of the study (Merriam, 1998). The process utilized in this research allowed for a holistic analysis of the data.

Limitations

This research contained a firsthand account of the researchers experience integrating iPads into a teacher education course on integrating technology. As a result, regardless of the intent to be impartial, the researcher's bias is included throughout the study. The researcher is the primary instrument for all data collection and analysis, so the data has been subjected to her theoretical position and bias (Merriam, 1998). In addition, all data collected for this research was based on self-reflection by the participants. The journaling completed by the researcher was a recording of her personal thoughts, ideas and opinions of the experience and the questionnaires were made up of open-ended questions soliciting the personal experiences of the instructors. Furthermore, the researcher's lack of prior knowledge on iPads may have influenced the study.

The research was completed at a teaching intensive university in the school of teacher education, and the cart system had never before been used in this department. Also, the information technology (IT) department at this university has had minimal experience with implementing cart systems, which may have led to additional complications during the semester. Finally, the students who were part of the pilot program are primarily seniors in secondary education in their last semester prior to student teaching. They have possibly completed the majority of their college career without utilizing iPads, and were only given the opportunity for use in this one course during class time. All of these parameters limit the generalization of the research.

Findings and discussion

Reflective journaling

Throughout the course of the semester the researcher recorded thoughts, feelings and ideas regarding the experience integrating iPads into ET449. Typically notes were recorded in a journal, but written and voice recorded electronic memos were also included. Most often this running record was completed following a class or during the instructors' weekly meetings. When analysis of the data began, the following general themes were identified: frustrations, student-centered instruction, student responses, and collaboration with other instructors.

Frustrations. Often following a class that did not run as smoothly as it should have, the researcher recorded frustrations. Typically these frustrations were a result of internet connection issues. Bandwidth is definitely a concern on this institutions campus. The apps used in class were already downloaded, but when 25 students in one class are trying to connect to the internet on iPads this becomes a significant struggle. Several times throughout the semester the researcher was unable to complete lessons as planned. Instead of taking full advantage of the iPads, students were required to share iPads, use the computers in the classroom, or use their personal devices to participate in the lessons. This defeats the mobile 1:1 aspect of iPads and is definitely a concern if a department wide 1:1 initiative is commenced in teacher education.

Student-centered instruction. The second reoccurring theme in the journaling was regarding student-centered instruction. Students were actively engaged in the projects completed in class whenever the iPads were utilized. The iPads allowed for hands on learning by the students and the opportunity to integrate the technology that is a part of their everyday lives. With iPads

available for every student during class time, lessons were created that allowed for active participation by students and effectively modeled student focused technology integration by the instructors, for the pre-service teachers' future teaching practices.

Student responses. The best and worst moments recorded were regarding student responses to the iPads. During the second class the iPads were introduced, and it was immediately evident who was familiar with the iPad and had previous Mac experience. In general, the students comfort using the iPads increased as the semester progressed. Over the course of the semester it was upsetting to see students who would give up when experiencing technical difficulties or internet connection problems. However, when students got excited about completing a project or more importantly, some tool or lesson idea they had discovered for use in their future classrooms, then the program acquired value. The focus of the projects and activities completed in ET449 were on how the students might integrate the technology into their specific content areas for their future classrooms. Repeatedly students told stories about lessons they had created for other classes or for their host classrooms, which integrated the technology being utilized in ET449. A few students even told stories in class about sharing technology from ET449 with their host teachers who then utilized the tool in their own teaching. Collaboration was a significant element in this initiative; watching students as they learned from their peers and helped each other with the technology was similar to the researchers experience regarding the need for collaboration.

Instructor collaboration. Collaboration between the researcher and the three other ET449 instructors was a necessity and something detailed regularly in the journal. It is intimidating to be given a device you have never used before, and be expected to integrate it into teaching future educators, with only two days of training prior to the start of the semester. The four instructors met on a weekly basis to discuss (among other things) this iPad initiative. This time was used to share lesson ideas, discuss the experience integrating the iPad, and improve the structure of ET449. At the start of the semester a Master ET449 shell was created on BlackBoard, a learning management system, so that collaboration was possible on projects and lessons, and so all instructors could view what occurred in the other classes. This collaborative aspect and support structure was invaluable during the experience and was repeatedly noted in the researcher's running record.

Questionnaires

At the end of the semester, the researcher emailed consent forms and questionnaires to the three other instructors of ET449. After receiving the completed questionnaires, the intense coding process of each question was conducted by the researcher and discussed with the instructors. Four themes emerged throughout each of the completed questionnaires: time, resources, collaboration, and 1:1 access.

Time. Integrating iPads into teaching as part of a new pilot program is a significant time commitment, which was noted by all of the instructors. Time was required to learn how to use the device, to create lessons that incorporate the device into projects completed in class, to research lesson ideas, and to research free apps that succeed in accomplishing the goals of the various ET449 modules.

Resources. There are a plethora of resources available to support iPads and technology integration, but finding the ones that are most beneficial is a significant task. The apps identified for incorporation into teaching needed to be free because there were no funds for purchasing them. As one instructor noted "there are a lot of resources out there, but figuring out which one is the right one for my student and sifting through all that can be daunting". Apps had to be researched much in advance of when they were to be used in classes because the process of downloading the apps on to the iPads had to go through IT, which was initially a very time intensive process.

Collaboration. The need for collaboration in lesson planning was highlighted by all instructors. The overall agreement was that collaboration allowed for an increase in lesson ideas, more effective incorporation of iPad technology, and the opportunity to work through problems encountered. Knowing that instructors were not going through this experience alone made it feel less stressful and overwhelming.

1:1 access. Every instructor noted that for more effective integration students needed to have access to the iPads outside of class. If the 1:1 mandate is enacted, this problem will be solved. However, in the meantime, a temporary fix would be to implement some system to allow students to check out the iPads when required to complete assignments. Because the iPads were used in four different classes not everyone could check them out continuously, but on a case-by-case basis, this may be an option.

Implications and future research

The intent of this research is to provide insight for other educators integrating iPads or possibly implementing a 1:1 initiative or cart system. It shares the knowledge that the process may be time consuming, difficult, and frustrating when encountering problems out of educators' control, but that other educators have accomplished similar initiatives and benefited from them. This research provides an example in teacher education with the focus on educating pre-service teachers for integrating technology into their future classrooms. Also, it resulted in valuable data for the possible 1:1 mandate of iPads in the school of teacher education. The research made note of the possibilities of a 1:1 initiative and some of the problems that may be encountered with a department wide integration of iPads. Overall, the data supports the integration of technology into teacher education and highlights the positive impact of a 1:1 iPad initiative.

During the completion of this study, the need for further research became apparent. There were several groups of individuals involved in this iPad initiative who could provide valuable insight from their connection to, and participation in, the pilot program. Perceptions of the IT experts working with the cart systems and the views of the students, who were in the classes, might be extremely beneficial. A multiple perspective account of iPad integration could increase the knowledge base and provide a more holistic vision of the process of integrating iPads into a teacher education course.

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