

A Review of Literature on E-Learning Systems in Higher Education

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Abstract

Due to the rapid growth of internet technology, universities around the world are investing heavily in e-learning systems to support their traditional teaching and to improve their students' learning experience and performance. However, the success of an e-learning system depends on the understanding of certain antecedent factors that influence the students' acceptance and usage of such e-learning systems. This study aims to provide a discussion of the current e-learning environments including their characteristics, limitations, advantages and the major factors that affect the acceptance of such technologies. It is concluded that a successful e-learning system should consider the personal, social, cultural, technological, organizational and environmental factors.

Keywords: e-learning systems, web-based learning systems, learning management systems, Literature review.

1. INTRODUCTION

Information technology (IT) is considered as one of the most fundamental forces for change in the all sectors of our lives (Alshurideh and Alkurdi, 2012; AL-Syaidh et al, 2015; Hajir et al., 2015; Shannak et al., 2012). Today many students want to learn online and in turn get degrees from worldwide colleges and universities, but still cannot go anywhere as they live in isolated areas without proper communication systems (Tarhini et al., 2014; Darawsheh et al., 2016). Consequently, many researchers encourage learning courses under the e-learning system as it saves time and energy of those students staying at any far off distant regions from the universities or colleges they have enrolled (Hubackova and Golkova, 2014; Alenezi et al., 2015). Indeed, e-learning adoption is increasing in most universities and institutions of higher learning all around the world. E-learning which is also known as web-based learning, is defined as the delivery of education in a flexible and easy way through the use of internet to support individual learning or organizational performance goals (Clark and Mayer, 2011, Maqableh et al., 2015). Furthermore, there are different kinds of e-learning system such as blackboard and second life. Both of blackboard and the second life systems are used for attended lecturers, do homework and so many services.

For instance, the second life was launched by Linden Lab in 2003 for the public use. It is commonly used for educational trainings. The second life makes the students feel as them in the university because it uses 3D technique (Masa'deh et al., 2012; Alenezi and Shahi, 2015; Maqableh et al., 2015). The second life has a lot of benefits as people can attend classes at home, engaging in the entirely new forms of communication to interact with others, have an entirely new way to solve the problems that might not been possible to perform in the 'real world' scenario and offers range of opportunities for researchers because of collaboration and connection between the users. Alenezi and Shahi (2015) explained that the second life needs high speed internet connection and computer devices. So some poor countries maybe faced many difficulties to use it. The researchers argued that virtual world will be the most effective arm for universities in the near future to support all sorts of distance learning systems. Although there are many drawbacks in the second life applications but its benefits make it at par and attractive. In the current scenario, second life cannot replace traditional online e-learning systems completely.

Initially, Smith (2009) stated that e-learning is among the most recent types of education systems that has been attracted the attention of the educators in the world. According to Arasteh et al. (2014), Draghici et al. (2014), and Mustea et al. (2014); e-learning is the method which allows people especially students to take courses from home or anywhere as he/she can access the internet, among other platforms such as peer-to-peer, client-server, and web services. Moravec et al. (2015) mentioned that there are several studies which are looking at how e-learning tools affect the result of students such as Fatih Baris and Tosun (2013) who described the influence of using e-tools in the education process at the high school and concluded the positive influence of this tool on students. In addition, the e-learning platforms allowed users to access information on the personal computers while mobile e-learning (M-learning) allowing users to access through mobile devices (Zamfiroiu and Sboru, 2014; Masa'deh et al., 2015; Almajali et al., 2016). Therefore, students could interact with their courses online via such technological platforms.

However, the success of an e-learning system depends on the understanding of certain antecedent factors that influence the students' acceptance and usage of such e-learning systems. This study aims to provide a discussion of the current e-learning environments including their characteristics, limitations, advantages and the major factors that affect the acceptance of such technologies. It is concluded that a successful e-learning system should consider the personal, social, cultural, technological, organizational and environmental factors.

2. CHARACTERISTICS, ADVANTAGES AND DISADVANTAGES OF E-LEARNING

E-Learning is the use of Information and Communication Technology (ICT) to deliver information for education where instructors and learners are separated by distance, time, or both in order to enhance the learner's learning experience and performance (Keller et al., 2007; Tarhini et al., 2016). Horton (2011) defines e-learning as a set of instructions delivered via all electronic media such as the internet, intranets, and extranets. Thus, by eliminating the barriers of time and distance, individuals can now take charge of their own lifelong learning (Almajali et al., 2016; Bouhnik and Marcus, 2006; Fletcher 2005; Obeidat et al., 2015). E-learning environments reduce the cost of provision and therefore increase revenues for academic institutions (Masa'deh et al., 2016; Ho and Dzung, 2010).

The universities must decide during or before the implementation phase on the best approach to deliver education, such as online learning, face to face, or apply blended approach. For the purpose of this study, e-learning with a particular focus on higher education institutions applies to the use of web-based learning systems to support face-to-face education. According to Wagner et al. (2008), this approach is the most successful learning approach compared to solely online and only face to face contact.

Learning Management Systems (LMSs) refer to the web-based delivery applications or technologies that are adopted by universities and other higher education institutions to deliver courses' contents, provide distance learning and to manage the education process (Freire et al., 2012). LMS creates a variety of ways to deliver instruction and provide electronic resources for student learning. Some methods, such as using Web pages to deliver text in much the same way as hard bound texts, are very familiar to academic staff. However, a big advantage is that the Internet also supports the delivery and use of multimedia elements, such as sound, video, and interactive hypermedia (Masa'deh et al., 2016; Tarhini et al., 2016). Different Web-based learning systems have been developed for higher education to facilitate learning in a web-based learning setting; these include Moodle, Web Course Tools (WebCT), LAMS and SAKAI, Blackboard Learn (BBL). The later will be discussed in detail in the next subsection.

2.1 Blackboard learning system

Blackboard is considered one of the most popular web-based learning systems tools in higher education today as it provides a framework for course delivery in addition to its ease of use by learners (Iskander, 2008). According to Blackboard Inc. (2012), it is defined as "the comprehensive technology platform for teaching and learning, community building, content management and sharing, and measuring learning outcomes and consists of integrated modules, with a core set of capabilities that work together." It is being used by more than 39,000 instructors at over 1,350 colleges and universities to deliver over 147,000 courses to more than 10 million student accounts in 80 countries. It integrates communication tools, including a bulletin board, chat room and private e-mail. In addition, graphics, video, and audio files can be included into a Blackboard site. Blackboard also provides instructional tools to support course content such as a glossary, references, self-test, and quiz module. Students, too, can place assignments and other materials in Blackboard for courses in which they are enrolled. Furthermore, Blackboard also gives academic staff course management tools for grading, tracking student interaction, and monitoring class progress (Tarhini et al., 2016). Such features can facilitate interaction between academic staff and students (Iskander, 2008). These tools are available only to the students and instructor of the course, the system requires a user name and a password in order to gain access (Tella, 2012), thus protecting the intellectual property of the instructor, the privacy of the student, and the course content from external parties.

2.2 Characteristics of Web-based learning

Web-based learning does not require extensive computer skills, although familiarity with computers and software (especially Web browsers) helps to reduce the acceptance barriers (Steven, 2001; Tarhini et al., 2013a). Web-based learning generally fits into one of three major categories:

Self-paced independent study: Students determine the schedule and study at their own pace. They can review the material for as long as necessary. Feedback from online quizzes takes the form of pre-programmed responses. Unfortunately, there is no one to whom the student can direct questions. This form of study requires the most self-motivation (Tsang et al., 2007).

Asynchronous interactive: The students participate with an instructor and other students, although not at the same time. They attend classes whenever they need or until the course material is completed. This approach offers support and feedback from the instructor and classmates. It is usually not as self-paced as independent study. It also allows time for considered responses and so critical thinking skills are enhanced (McCombs, 2011). This can improve in-depth investigation of a topic. Moreover, it can also provide social support and encouragements for individuals and increase the total effort put forth by group members (Benbunan-Fish et al., 2005). This approach will shift the attention from the instructor-centered to learners-centered (McCombs, 2011). This will produce a more egalitarian, democratic environment in which the instructor becomes a guide for knowledge (McCombs, 2011).

Synchronous learning: Students attend live lectures via computer and ask questions by e-mail or in real-time live chat. This format is the most interactive of the three and feels the most like a traditional classroom. Flexibility is restricted by the previously determined lecture schedule. There are limited course offerings in this format due to high delivery costs (Weimer, 2013).

For the purpose of this study, e-learning with a particular focus on higher education institutions applies to the use of web-based learning systems to support face-to-face education.

2.3 Advantages of Web-based learning

Callan et al. (2010) and Garrison (2011) identified many advantages for e-learning technologies including:

- Less expensive to deliver, affordable and saves time
- Flexibility in terms of availability- anytime anywhere. In other words, e-learning enables the student to access the materials from anywhere at any time.
- Access to global resources and materials that meet students' level of knowledge and interest.
- Self-pacing for slow or quick learners reduces stress and increases satisfaction and retention.
- E-learning allows more affective interaction between the learners and their instructors through the use of emails, discussion boards and chat room.
- Learners have the ability to track their progress.
- Learners can also learn through a variety of activities that apply to many different learning styles that learners have.
- It helps the learners develop knowledge of using the latest technologies and the Internet.
- The e-learning could improve the quality of teaching and learning as it supports the face-to-face teaching approaches.

2.4 Disadvantages of Web-based learning

While Web-based courses have advantages, it is equally important to note that there are disadvantages. These might include little or no "in-person" contact with the faculty member, feelings of isolations, a difficult learning curve in how to navigate within the system, problems with the technology, the need for the student to be actively involved in learning, and increased lead-time required for feedback regarding assignments (Holmes and Gardner, 2006; Masa'deh et al., 2013; Kanaan et al., 2013; Tarhini et al., 2013b). There are also different aspects, especially in the developing countries, such as providing the required funds to purchase new technology, lack of adequate e-learning strategies, training for staff members and most importantly the student resistance to use the e-learning systems (Wagner, 2008).

Bouhnik and Marcus (2006) stated that learners' dissatisfaction in using e-learning included the following:

- Lack of a firm framework to encourage students to learn.
- A high level of self-discipline or self-direct is required, learners with low motivation or bad study habits may fall behind.
- Absence of a learning atmosphere in e-learning systems.
- The distance-learning format minimizes the level of contact, e-learning lacks interpersonal and direct interaction among students and teachers.
- When compared to the face-to-face learning, the learning process is less efficient.

3. LITERATURE REVIEW ON E-LEARNING ADOPTION

Despite the enormous growth of e-learning in education and its perceived benefits, the efficiency of such tools will not be fully utilized if the users inclined to not accept and use the system. Therefore, the successful implementation of e-learning tools depends on whether or not the students are willing to adopt and accept the technology. Thus, it has become imperative for practitioners and policy makers to understand the factors affecting the user acceptance of web-based learning systems in order to enhance the students' learning experience (Tahrini et al., 2014a). However, recent studies have shown that e-learning implementation is not simply a technological solution, but also a process of many different factors such as social factors (Schepers and Wetzels, 2007; Tahrini et al., 2014b; 2015), and individual factors (Liaw and Huang, 2011), organizational such as facilitating conditions (Sun and Zhang, 2006) in addition to behavioural and cultural factors (Masoumi, 2010). Such major factors play an important role in how an information technology is developed and used (Kim and Moore, 2005).

Fischer et al. (2015) studied how proceedings of scientific conferences can be used for trend studies in the field of e-learning. They examined the abstracts of 427 scientific articles of leading German-speaking e-learning conferences Gesellschaft für Medien in der Wissenschaft and E-Learning-Fachtagungen der Gesellschaft für Informatik e. V. (GMW and DeLFI) – published from 2007 to 2013. The study was conducted at German-speaking conferences and, thus, reflects the situation in Germany, Switzerland and Austria. Fischer et al. (2015) made an important contribution to the diffusion of digital media in higher education. The researchers found that the detailed analysis of the frequency distribution over the seven years reflects the intensity of scientific discussion towards e-learning trends, and conclusions about the didactical or technical potentials of innovations can be introduced. Specifically, they found the development potential of learning management, mobile learning, virtual worlds, e-portfolio, social media and Massive Open Online Courses are crucial for e-learning in German higher education.

Moravec et al. (2015) showed how e-learning tools impact students' achievement. The study was attended by nearly 2000 students. According to Moravec et al. (2015), the study compares the results of questions from the area of law where the tool was provided in a pilot version with the results of questions, where the e-learning tool was not provided. The researchers found that the e-learning tools have affected the students' results. Nevertheless, the belief of the e-learning tool may possibly have a negative effect on students who will depend on given materials was disproved.

By using the Cohen's model and based on data collected from 15 documents from relevant research studies conducted on the effect of ICT based e-learning on academic achievement during 2010-2012, Mothibi (2015) examined the relationship between e-learning and students' academic achievement in higher education. The researcher found that ICT had a statistically significant positive influence on e-learning based students' academic achievements. The results also indicated that ICT had a significant positive influence on students' educational overall academic achievements.

Scholtz and Kapeso (2014) and Almajali et al (2016), Shannak (2013) explored the factors of mobile learning (m-learning) approaches which can be used for enterprise resource planning (ERP) system. The technology acceptance model (TAM) was applied to assess the acceptance, usefulness and perceived ease of use of the m-learning. The researchers found that the m-learning system was correlated positively for perceived ease of use and perceived usefulness as such findings confirmed other studies which stressed the importance of the quality of course content in e-learning and m-learning projects.

Pieri and Diamantini (2014) conducted their research based on the experience of e-learning web 2.0 at the University of Milano-Bicocca in the academic year of 2011-2012. The objective of the research was to make the implicit and tacit knowledge that the users have, explicit, and therefore more accessible. Since the ICTs have become an essential part of the learning experience for people all ages, so it's become a concept that needs to be explored, the researchers started elaborating the transition from Web 2.0 to e-learning and the aggregation of the power of Web 2.0 with social networks in the learning process. They used Thinktag Smart, a new Web 2.0 platform; that mixes the learning opportunities offered by the web 2.0 with the learning opportunities of social networks for sharing knowledge, to train 137 students in two subjects (Tourism, and Sociology of innovation), after this experience they gave them a questionnaire to evaluate the learning experience, and the platform. Thinktag Smart had some features that were most used in the platform: (resources, shelves, and groups); where the least used were: (Wiki, collections and chat), the strengths of the platform which made it generally appreciated, were; the resources or the ability to exchange and share information with users of Thinktag Smart; support teaching as the portal was open to share notes and materials connected to courses they need; and the interactivity feature of the platform provided for the users. As for the weaknesses, which didn't allow for the complete satisfaction, they were; the slowness in loading the pages, the unclearness/complexity, the lack of immediacy, and intuitiveness. In sum the platform was a tool of great potential, but to be competitive; realities need further improvements.

Salter et al. (2014) aimed to demonstrate the features and benefits of the practice of e-education in general and in particular in the pharmacy, where e-education helps to clarify the vehicles pharmaceutical and elements of

vehicles in that it would facilitate the process of analysis and helps to count the number of elements, a more precise and faster, where there are a number of theories that help to clarify more broadly. It is those theories to determine the effectiveness of the system and how to explain overlaps that occur within complex e-education system and therefore the system's capacity for analysis and helps greatly stunning offers time and effort and cost. The researchers found that e-learning to be effective at increasing knowledge immediately after training for all topics and in all contexts. E-learning in pharmacy education was a highly suitable instructional format for pharmacists and pharmacy students. It is the benefits that help their e-education system in the field of universities, where all the students are taking the attendance and leave them through computer system due to the student e-education, e-has to know the number of absence, as well as upon request duties is due to send and receive the solution through e-education persist this system its ability to sweep all organizations work accuracy and speed.

Teo (2014) aimed to clarify the extent of teacher satisfaction of the application of e-learning program among persevering teachers. Teo (2014) investigated the key drivers of teachers' e-learning satisfaction. 387 participants in a postgraduate diploma education completed a survey questionnaire to measure 6 constructs (tutor quality, perceived usefulness, perceived ease of use, course delivery, facilitating conditions, and course satisfaction). By using structural equation modeling, data analysis showed that, apart from facilitating conditions, all other constructs were significant predictors of e-learning satisfaction. Nevertheless, the facilitating conditions construct was found to be a significant mediator of perceived ease of use and satisfaction.

The trend of using e-learning as learning and teaching tools is now rapidly expanding into education. Suri and Sharma (2014) examined the relationship between disciplines of students and their responses and attitudes towards e-learning. The researchers used computer and e-learning attitude scale by employing survey questionnaires to 477 students enrolled in various courses across 6 major disciplines in Panjab University Chandigarh, India. The researchers found a significant relationship between discipline of student and the factors of scale on computer and e-learning attitude which set emphasis on the role of department in learning and satisfaction level of students.

Arasteh et al. (2014) proposed a dynamic resource management model to develop the availability and dependability of the e-learning services in the grid system. A dynamic replication technique was employed to tolerate resource failure/unavailability during the execution of an e-learning service in the economic grid system. The researchers found that the availability of the e-learning services in the proposed model was higher than those of the basic resource management services. This model maintains a trade-off between cost and the degree of quality of e-learning services.

Ceobanu and Boncu (2014) investigated in a theoretical manner the challenges associated with the use of mobile technology in adult education. They argued that mobile learning (mLearning) can be placed at the connection of eLearning and mobile computing, which is differentiated by the capability to access learning resources anywhere, anytime, through high capabilities of search, high interaction, high support for effective learning and ongoing assessment based on performance. Also, mLearning considered to be an extension of eLearning, but characterized by its independence from a location in space and time. Furthermore, mLearning comprises the use of mobile technology in the service of the processes related to teaching and learning. The mLearning can be considered as the point where mobile computing and eLearning meet to create a learning experience that can be commenced anytime and anywhere.

Beurs et al. (2015) argued that randomized researches investigating the impact of training of mental health professionals in suicide prevention guidelines are limited. The researchers evaluated whether professional benefited from an e-learning supported train-the-trainer program aimed at the application of the Dutch multidisciplinary suicide prevention guideline. 45 psychiatric departments from all over the Netherlands were clustered in pairs and selected randomized. All of the staff of psychiatric departments was trained by peers with an e-learning supported train-the-trainer program. Multi level analyses were employed to find if variation between conditions was due to differences between individual professionals or departments. The study found that the intervention resulted in an improvement of individual professionals. At the three month follow up, professionals who received the intervention demonstrated greater guideline adherence, enhanced self-perceived knowledge and superior confidence as providers of care than professionals who were only exposed to traditional guideline dissemination. Also, the analyses showed that enhanced guideline adherence was found among nurses but not among psychiatrists and psychologists, and there was no significant effect of the intervention on team performance.

According to Judrups (2015), the development of knowledge management and e-learning unsurprisingly are developed for years as both disciplines deal with knowledge capture, sharing, application and generation; have vital technological components to enhance learning; and contribute to building a continuous learning culture. Judrups (2015) found that knowledge management and e-learning naturally brings both disciplines closer and supports integration. Model analysis confirmed several integration approaches. The more general approach is to base integration on common ground, which is identified as learning. Nevertheless, these approaches are not implemented in production environment and require necessary technical specification and application support.

Jakobsone and Cakula (2015) aimed to get a new perspective on knowledge sharing process, and better understand the future of automated learning support system involving the use of new technological opportunities. The major study question was how the automated learning support system could develop the efficiency and quality of further knowledge flow and offer sustainable cooperation between educational institutions and entrepreneurs. The researchers found that the analysis of the information system as an online learning support platform, improved quality of knowledge flow, and recommendations for advancing work-based learning besides the encouragement of efficient knowledge management technologies. Furthermore, innovations in the learning process needs to be real and simple to help adults find how to solve their problems; preparation of training is needed following a specific employer demand and knowledge sharing has to be equally vigorous on both interested sides; and needs have to be obtained; and accurate content and quality must be presented according to merchant's prospects.

4. CONCLUSION

This paper critically reviewed the literature related to e-learning systems and identified some of the most influential factors used in the field of information systems research. More specifically, this paper had an insight on the origins, characteristics as well as the limitations, weaknesses and strengths of web-based learning systems. Student variables, such as behaviours and attitudes, cultural backgrounds and other demographic characteristics are important variables that influence student learning, especially in a collaborative e-learning environment. Understanding these variables is now helpful for instructors to design meaningful educational activities to promote student knowledge construction and make learning more effective and appealing. In particular, this research helps to better understand the characteristics of students in Lebanon and England respectively, which can help policy makers, educators and experts to understand what the students expect from the learning management systems. This can help the management achieve the most effective deployment of such system and also helps them improve their strategic decision making about technology in the future, they can decide on the best approach that fit their students before implementing any new technology

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