

Success Factors for Utilizing e-Learning Systems in Higher Education Institutions

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Abstract: e-Learning is important in developing countries in order to chart new directions in education, especially in Iraq's higher education sector. It has been started and implemented for educational associations. Most of the world has embraced the concept of open education via the internet or by enabling students to access information and knowledge resources from anywhere and anytime. e-Learning offers many advantages to institutions which can use this system to grow the level of education for different kinds of students including normal students and those with disabilities. However, the e-Learning system faces many challenges in developing countries such as Iraq because of the lack of understanding and weaknesses in experience and skills among the students as well as among many institutions. Also, there is a lack of customization to facilitate the development of ICT. e-Learning system can be useful for students if the critical success factors associated with the utilization of ICT e-Learning systems are determined.

Key words: e-Learning, success factors, ICT, higher education, utilization, Iraq

INTRODUCTION

e-Learning is explained as an educational way of providing learning to stakeholders through courses and programs employing new technology on the internet. In other words, the stakeholders such as students and teachers can utilize this platform to improve learning skills at anytime and anywhere by using desktop computers, laptops, tablets and smartphones, all of which are powered by internet technologies (Garrido *et al.*, 2016). In addition, e-Learning is defined as any platform technology that is able to develop effective students through the open education concept of e-Learning which has proved to be a game-changer in the field of education, particularly higher education in this new millennium. (Aparicio *et al.*, 2016).

In tandem with the growth and rapid advances in technology and Internet requests in this century, ICT is an important component that makes e-Learning more beneficial and accessible. Furthermore, with the use of internet technology, e-Learning systems allow education programs to be planned without having to be constrained by time and place (Fahad *et al.*, 2013; Ahmed *et al.*, 2016). This novel approach to virtual teaching and learning has been widely accepted as significantly enhances higher education and knowledge acquisition (Chen and Tseng, 2012).

The world after the technology revolution and emergence of internet-based higher education since late in the first decade of the 21st century has been utilizing e-Learning in several establishments of higher education for the purpose of increasing the number of students as well as enhancing their skills and experiences (Fahad *et al.*, 2013).

Recently, some researchers have designed models for promoting e-Learning and considered the implementation of an e-Learning system with specific spaces suggested but these models have a weakness in considering the students as the main focus (Pata, 2009).

As such, ICT is important to improve and develop the utilization of the e-Learning system. Infrastructure is prepared to be compatible with any modern technology and this technology is more flexible when applied in high education. Furthermore, this technology must be useful and easy to use among both students and teachers.

According to a UNESCO report in 2011, Iraqi higher education has been limited in using e-Learning based on information and communication technology. In addition, UNESCO has been initiated a different approach to improve ICT infrastructure for students that would embrace a transformation in the quality of e-Learning system based on ICT.

Unfortunately, e-Learning is still a new experience in Iraqi higher education because Iraqi universities have

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been the last to adopt e-Learning in the Middle East. Furthermore, until 2009, only 1% of Iraqi students had Internet access. Thus, Iraq lags behind other countries in terms of benefitting from the revolution of e-Learning based on ICT in higher education. Therefore, The Ministry of Higher Education has made concerted efforts to raise the status of Iraq universities. However, strategically, Iraqi higher education has seen limited progress in the adoption of e-Learning (Al-Azawei and Lundqvist, 2015a, b).

Therefore, high lighting the requirements in order to implement e-Learning system based on ICT in Iraqi universities is important to fill the gap in the literature by determining the critical success factors and specifying the major barriers that have a significant effect on adoption of the e-Learning system. In the context of the above-mentioned scenario, the researchers discuss in this study, the e-Learning system based on ICT in Iraqi universities in order to identify the success factors and have a clear understanding to ensure the successful implementation of the e-Learning project in future.

According to Safie and Aljunid (2013), the study high lights the use of e-Learning system which is of great importance as e-Learning system plays a pivotal role in the developing different organizations in education and healthcare among others which is essential in developing countries and in in line with the ideals of the Millennium development goals. Furthermore, it has been shown that e-Learning is time saving as well as cost-effective.

MATERIALS AND METHODS

In this study, the literature was reviewed to collect secondary date related to e-Learning systems in order to discuss ways of adopting a conceptual model to show the relationship between factors that affect the utilization of an e-Learning system in higher education.

The current issues in some developing countries such as Iraq, Libya, etc. are handicapped regarding the application of the appropriate resources and the required experience in terms of e-Learning (Fahad *et al.*, 2013).

Although, the ministry of higher education in Iraq has taken steps to promote teaching and learning through e-Learning in Iraq (Al-Azawei and Lundqvist, 2015a, b), problems persist in coping with the rapidly changing challenges that require innovation.

Furthermore, UNESCO has agreed that e-Learning is an essential tool which needs to be adopted and adapted for implementation in most education sectors for Iraq (Basha *et al.*, 2013).

This study aims to determine the critical success factors of e-Learning systems based on ICT in Iraqi public

Table 1: Frequency of factors

Factors	References
IT infrastructure	Alsabawy <i>et al.</i> (2013, 2016) and Jabbouri <i>et al.</i> (2016)
System quality	Hassanzadeh <i>et al.</i> (2012), Bhuasiri <i>et al.</i> (2012) and Liaw (2008)
Multimedia instruction	Liaw (2008)
Service quality	Hassanzadeh <i>et al.</i> (2012)
Ease of use	Al-Azawei and Lundqvist (2015a, b), Basha <i>et al.</i> (2013), Aparicio <i>et al.</i> (2016), Abdullah <i>et al.</i> (2016), Chen and Tseng (2012) and Wu and Chen (2017)
Usefulness	Chen and Tseng (2012), Wu and Chen (2017), Alsabawy <i>et al.</i> (2013, 2016), Liaw (2008), Bhuasiri <i>et al.</i> (2012), Aparicio <i>et al.</i> (2016) Abdullah <i>et al.</i> (2016), Sun <i>et al.</i> (2008), Chen and Tseng (2012), Islam (2013), Al-Gahtani (2016) and Lee <i>et al.</i> (2009)
Openness	Wu and Chen (2017)
Self-efficacy	Liaw (2008), Al-Azawei and Lundqvist (2015a, b), Sun <i>et al.</i> (2008), Lim <i>et al.</i> (2007), Chen and Tseng (2012), Tarhini <i>et al.</i> (2013) and Islam (2013)
User satisfaction	Alsabawy <i>et al.</i> (2013), Hassanzadeh <i>et al.</i> (2012), Liaw (2008), Al-Azawei and Lundqvist (2015a, b), Sun <i>et al.</i> (2008) Wu <i>et al.</i> (2010), Lin (2012), Chow and Shi (2014) and Paechter <i>et al.</i> (2010)

universities. In addition, the e-Learning systems should be supported and both students and lecturers should be encouraged to use these technologies. The various relevant factors are summarized and presented in the table according to the references in Table 1.

Success factors: As we can see, the majority of the researches focuses on the usefulness factor while some factors have low frequency as shown in Fig. 1. Therefore, it is recommended to focus on the rarely considered factors in this research area in order to ensure a successful utilization of e-Learning system.

After reviewing the literature for the success determinants, the researchers recommend the following factors which can draw a successful the utilization of e-Learning system in higher education institutions.

IT infrastructure: An IT infrastructure defines that all new technologies should be considered to make the use of the e-Learning system more flexible and integrated. In addition, IT infrastructure for stakeholders should include both technical and management skills which are important to give the best results. The capability of IT infrastructure should be exploited in using e-Learning system to achieve a better service for the stakeholders in terms of accuracy and confidence. Therefore, the necessary infrastructure and appropriate human resources are necessary for the successful implementation of modern technology (Gorla *et al.*, 2010; Kadhum and Hasan, 2017).

The IT infrastructure includes all the IT technologies such as internet bandwidth, network equipment and a

Fig. 1: The percentage of frequent factors

sufficient number of computers (Raouf *et al.*, 2012). IT infrastructure is one of the key factors in information systems and is a prerequisite for the successful implementation of any modern technology which means that the universities must pay attention to establish an adequate IT infrastructure to achieve competitive performance (Alsabawy *et al.*, 2016).

The IT infrastructure is a crucial factor in the implementation of the service activities in education and in the context of e-Learning systems, it forms the basis of computer technology, communications and the essentials of the information system within the technical scope to improve education. With an adequately established IT infrastructure an organization can deliver reliable services through the central information system. To achieve competitive advantage higher education can adopt a method to classify the IT resources such as hardware, software, networking and communications, human resources and databases (Jabbouri *et al.*, 2016).

According to Alsabawy *et al.* (2013, 2016) and Jabbouri *et al.* (2016), this factor has a significant effect on the utilization of the e-Learning system.

System quality: Today, one of the biggest problems facing e-Learning system is system quality that can facilitate the successful implementation of technology in universities. In fact, system quality is a multi-dimensional measure and it is important to determine how system quality can help the higher education sector in developing

countries to build and improve strategies. The significance of system quality for organizational performance has been highlighted (Gorla *et al.*, 2010).

The benefits of this factor in e-Learning system are reflected it assists in functions and end-user simplification in education operation. e-Learning system is important for the delivery of learning outcomes because students interact more in an e-Learning environment than in traditional face-to-face instructions. System quality affects a student's belief in e-Learning performance characteristics (Bhuasiri *et al.*, 2012). Furthermore, it is measured based on the way the system is run, ease of use, accessibility, flexibility, information quality, portability, integration and significance (DeLone and McLean, 2003).

According to Alsabawy *et al.* (2016), this can be considered as a significant factor in using e-Learning system and system quality is the important factor in evaluating the success of the e-Learning system.

In addition, the researcher (Alsabawy *et al.*, 2013) high lighted this factor which determines continuous implementation of the e-Learning systems.

Multimedia instruction: Multimedia instruction include voice and graphics information such as picture and text, so, learning can be more interesting and easy and effective for students (Tabbers *et al.*, 2001).

According to Liaw (2008), multimedia instruction assist stakeholders such as students and lecturers to increase their skills and experience in voice or video media by converting the difficult pedagogical materials and making them easier to understand. Furthermore, this factor would help students to use e-Learning system for other acquired concepts and enable them to apply conceptual knowledge using the flexibility of e-Learning systems.

Service quality: Service quality is known as the scale of service delivered by the information system service. This factor involves supplying the stakeholders, parallels to their anticipation in terms of expression, accuracy, realization, understanding, confirmation and consideration. These concepts of service quality are reflected in the stakeholder's reactions to the ability of the system to meet their expectations, through experts in information systems which give advice freely. Furthermore, providing services to learners when they are needed builds confidence (Gorla *et al.*, 2010).

On the other hand, this factor implies providing a range of services to lecturers and students reliably, so, they are aware of all the benefits of the system. This can have a significant effect on using e-Learning system. Some researchers think that this factor of service quality

is a division of system quality but it has been changing the function of information systems in recent years and has become a separate factor (Hassanzadeh *et al.*, 2012). According to Alsabawy *et al.* (2016), service quality has an effect on utilization e-Learning system in the universities. Previous studies showed that universities and other organizations pay more attention to improve service quality. According to Sun *et al.* (2008), service quality will positively influence utilization of e-Learning systems.

Ease of use: Ease of use is defined as “the degree to which an individual believes that using a particular system would be free of physical and mental effort” (Davis, 1989). Furthermore, Technology Acceptance Model and TAM2 explain the significant effect of ease-of-use when using a new technology or system (Venkatesh and Davis, 2000). It is directly associated with using e-Learning because students, more specifically in training courses are reluctant to continue using an e-Learning system if they face difficulties in utilizing it which could induce them to drop a course or to change to another learning environment (Al-Azawei and Lundqvist, 2015a, b).

As such, it is crucial to show how easy and effective a system is in terms of use and system effectiveness which would encourage understanding and acceptance of modern technology among students (Lim *et al.*, 2007).

According to Bhuasiri *et al.* (2012), prospective stakeholders and learner anticipation in using e-Learning system can be made easier and more compressive. In otherwords, the ease-of-use has a significant effect on utilization of e-Learning systems (Sun *et al.*, 2008) (Al-Azawei and Lundqvist, 2015a, b).

Ease-of-use in contrast, refers to “the degree to which a person believes that using a particular system would be free of effort”. This definition refers to “ease” “freedom from difficulty or great effort”. Effort is a finite resource that a person may allocate to various activities for which he or she is responsible (Davis, 1989).

In addition, the UTAUT Model states that the “effort expectancy” construct can be important in determining user approval of e-Learning systems and worry about ease-of-use may become non-important through extended implementation. Thus, ease-of-use can be expected to be significant in the early stages of utilizing e-Learning systems (Marchewka *et al.*, 2007).

Usefulness: Davis (1989) defined usefulness as “the degree to which a person believes that using a particular

system would enhance his or her job performance” (Davis, 1989). According to Davis *et al.* (1989), usefulness is considered to be the main construct in the original representation of the Technology Acceptance Model (TAM).

According to Bhuasiri *et al.* (2012), this factor measures the degree to which a stakeholder trusts that using e-Learning system will enhance achievement. In addition, usefulness shows how the students use the e-Learning system to enhance their research and execution and with expectations of more benefits in the future (Gorla *et al.*, 2010). Furthermore, this component can support using e-Learning system in higher education (Sun *et al.*, 2008; Chen and Tseng, 2012). In addition, this factor is considered important to measure the success of using e-Learning system and acceptance of any new technology (Alsabawy *et al.*, 2016).

In the e-Learning system, usefulness has been much and frequently used by researchers such as Arbaugh (2000). Usefulness or benefits of using technology help to deliver educational materials and promote the behavior of students toward their educational skills. Thus, it would help students to learn and be educated through the internet in the future.

Openness: Today, modern universities focus on a mix of technology and teaching materials to make education more visible and accessible to deliver resources anytime and anywhere which enables education to be more flexible. The idea is to encourage students to be more motivated toward changing traditional practices in learning and embrace new technologies in education (Wu and Chen, 2017; Safie, 2004).

Self-efficacy: Self-efficacy has been described as students cognitive trust that significantly affects their behavior when utilizing e-Learning system and the stakeholder has the ability to implement e-Learning with more confidence in achieving successful utilization (Wu *et al.*, 2010).

e-Learning has recently been used and has gained popularity in higher education in developing countries which means that the self-efficacy factor is important in helping students to utilize the new technology that is inherent in the e-Learning system (Bhuasiri *et al.*, 2012; Wu *et al.*, 2010; Samsuri *et al.*, 2014).

Self-efficacy is reflected in student’s desire to play a private functional part. It is an estimation of the effect and potential for success before implementing the new system. Students with rising self-efficacy can be confident in performing the e-Learning system activities

and developing their skills. Much research has explained the impact of self-efficacy on using new technology. Furthermore, it has been reported that particular self-efficacies can impact learning outcomes when students are using e-Learning system (Joo *et al.*, 2000; Lewis, 2002; Sun *et al.*, 2008).

According to Wang and Newlin (2002), investigation has shown that students tend to use the factor of self-efficacy to adopt network-based learning which significantly affects the utilization of the e-Learning system. This study defined this factor as the student's ability to evaluate the viability of implementing activities required in the e-Learning system.

User satisfaction: User satisfaction is shown in the way students think about using the e-Learning system mainly to evaluate the success in implementing modern technology. Furthermore, this is one of the critical factors with a direct effect on utilizing the e-Learning system (Hassanzadeh *et al.*, 2012) and it is not surprising that many earlier researches have focused on user satisfaction (Hassanzadeh *et al.*, 2012).

According to Min *et al.* (2008) it has been found that user satisfaction is one of the critical factors that influence the utilization of e-Learning because there are significantly different user skills involved such as transmission, input and output, features which endear students to the e-Learning system. It can therefore be concluded that for a system like e-Learning to be accepted and used it must offer user satisfaction. According to Wixom and Todd (2005) it has been shown that the various design attributes explicitly enumerated such as accuracy and reliability contribute significantly to user satisfaction and the utilization of the e-Learning system. Furthermore, TAM and user satisfaction have developed in parallel study streams and the two approaches can be integrated to help in building a conceptual model incorporating the design and system characteristics to forecast the success of utilizing e-Learning system.

By DeLone and McLean (1992) the researcher shows that user satisfaction is one of the significant factors that can estimate the success of utilizing e-Learning because some users have stopped their e-Learning following a first attempt.

According to Roca *et al.* (2006), the user satisfaction factor directly affects learner impact and has significant impact on the organization. Furthermore, this factor is important as it affects e-Learning usage besides having the strongest, direct personal impact. In light of the many benefits of the user-satisfaction factor, it can be used by

universities to target resources more efficiently, achieve improvements in user satisfaction and increase the probability of users reusing the e-Learning system.

RESULTS AND DISCUSSION

e-Learning has reached a new level of importance for decision makers in higher education institutions. It offers a new direction in developing countries like Iraq to be used in teaching and learning, so, implementing and using this system has become essential for higher education in the country. Use of e-Learning can help students through a system of distance education using the internet alone or to support the student's activities wherever and whenever needed, developing the interaction of class students beyond the class without the need for face-to-face meetings or to support semi present teaching activities.

Although, there has been acceptance of e-Learning as an important teaching-learning platform to our best knowledge there have not been many studies that have evaluated the determining factors of successful e-Learning implementation.

This study provides related studies in the field of online education that have presented critical success factors influencing utilization of the e-Learning system based on ICT implementation, although, the majority of the available research has focused on technological and educational aspects which represent the operational level in the organization. The aim of the study is appropriate because it highlight multiple organizational factors that can lead to successful project implementation of e-Learning in institutes of higher education.

An approach to understanding e-Learning based on ICT should consider the determinants that should be effectively addressed if a project is to succeed. To the best of our knowledge here have been very few studies that have identified e-Learning based on ICT critical success factors.

A research focused specifically on the critical determinants highlights the significant elements that must be taken into consideration when implementing the e-Learning system in higher education. The literature review, we conducted has gathered relevant information from multiple studies related to this research focus on utilizing e-Learning in higher education.

Figure 2 explains the conceptual model of the present study. The researcher suggest these factors in order to help the decision makers in Iraqi Universities to successfully adopt e-Learning system based on ICT

Fig. 2: Conceptual model

technology by understanding the effect of these factors on successful adoption. It is suggested that future research on this topic be empirically investigated.

CONCLUSION

This study aims to investigate the success factors to utilize ICT e-Learning systems in Iraqi universities in order to make students more satisfied when using this system. The study used a literature survey to gather related information and identify relevant factors and their effect on student satisfaction with using e-Learning system. The outcome revealed that nine factors should be highlighted when utilizing e-Learning system based on ICT in Iraqi public universities.

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