Factors affecting the effective implementation of e-learning in educational institutions

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Abstract: E-learning is an essential trend in education for the 21st century. In fact, students need the ability to use knowledge to communicate, collaborate, analyze, create, innovate, and solve problems in order to be successful in a global economy. The implementation of electronic learning (e-learning) systems impact on the educational environments and offer learners great flexibility, encourage risk taking, help students to be active learners and enhance their higher order thinking. This paper reviews the literature as it pertains to factors affecting effective implementation of e-learning for instructors andstudents in educational institutions. It is concluded that e-learning practice needs a good ICT infrastructure and active and collaborative involvement of a number of other people. Access to the technologies and pedagogical issues and institutional support services are important in the successful e-learning practice.

Key words: E-learning, educational institutions, students, lecturers, administrators

Introduction

The Internet is considered as a pivotal tool in world communications. According to Kozma (2005), Internet and other Information and Communication Technology (ICT) accelerate the emergence of an information society and knowledge economy. "The rates of proliferation of network, access to the system, and advances in Internet/Web technology have increased the rapid growth of the e-learning approach" (Karaali, Gumussoy, & Calisir, 2011, p.343). Using a web-based learning system (online learning) has significant impact on the educational environments. E-learning provides students with an anytime/any place independent learning environment. Resources which are found at home, libraries, and universities are woven together to connect learners in distinctive and new ways to form a community of learners. In addition, online learning offers new possibilities to integrate various types of learning content according to the learners' need and is additionally compatible with the learners' preferred learning styles (Little, 2001).

The use of Internet or ICT has revolutionized higher educational organizations and has affected teaching and learning contexts in universities and educational institutions all over the world (Salmon & Jones, 2004). Broadbent (2003) pointed out that e-learning changes the way learner learn, lecturers teach, designers develop, and administrators manage. Adams and Seagren (2004) also stated that e-learning can increase institutional reputations, enhance teaching and learning quality, and offer more flexibility in student learning. In fact, cultivating student's creativity and critical thinking abilities is a major goal of most of the educational systems (Roth, 2010). These skills are critical for students while engaged in academic learning because they help students " to generate novel and useful ideas, evaluate the arguments of others and their own, resolve conflicts, and come to well-reasoned resolutions to complex problems" (Behar-Horenstein & Niu, 2011, p.25). Effective use of online learning can help students to achieve this goal.

On the other hand, Spender (2002) pointed out that lecturers who use e-learning system face some challenges such as heavy teaching and learning loads, time constraints, lack of easy access to necessary equipment, irreversible pedagogical consciousness-raising and patience with new media, and lack of personal technical skills. These

challenges could lead to resistance to participate in e-learning. Traditionally, technical issues such as technical infrastructure have been considered as an important element in e-learning implementation. However, nowadays, the human element has been recognized as a critical factor of any technology innovation. In other words, successful e-learning practice in higher education depends on the individuals who use it (Geisman, 2001). The engagement, endeavors, good interpersonal relationships and cooperation among instructors, students, technical support people, and institutional administrators is very important.

Palloff and Pratt in 2001, pointed out that:

"… the more typical online student is seeking an active approach to learning and more involvement in the learning process…. [They are] not content with being taught to, the online student seeks to engage with faculty in a more collaborative learning partnership". (p. 2)

If online courses cannot satisfy students' needs, they are likely to withdraw from the course. According to Willging and Johnson (2004), "it is estimated that dropout rates for distance education are higher than those for on-campus programs and courses" (p. 106). In line with this idea, Frankola (2001) pointed out that "although there is significant variation among institutions … several administrators concur that course-completion rates are often 10 to 20 percentage points higher in traditional courses than in distance offerings" (p. 2). This represents a large amount of lost investment for educational institutions. Therefore, it is important to explain and understand the factors that affect the use of online learning systems because these systems aim at improving the performances of both the University and students as complements of each other. Several research studies and change theories introduced factors contributing to the successful implementation of educational technologies. We can categorize them into two broad categories (organizational factors and individual factors) that should be assessed before and during designing and developing the e-learning practices. In the following section, these factors will be reviewed and a model for successful implementation of instructional innovations will be highlighted. In fact, understanding the pedagogical, psychological and cognitive factors to the successful use of information technology is a vital precondition for improving the utilization of computers and other technological aids in the educational process (Benzie, 1995). Also, the detection of these factors provides information that is helpful in supplementing existing training programs. So, this paper is aimed at educators and policymakers who would like to learn from the research and experiences of others. It is hoped that the knowledge gained from this paper would be useful to these people in making wise decision in relation to their technology investment.

Factors Contributing to the Successful Implementation of e-learning

Organizational Factors

Effective Leadership

Many scholars believe that effective leadership is critical to the successful integration of technology into the schools (e.g., Anderson & Dexter, 2005). According to Flanagan and Jacobsen (2003), effective leaders encourage teachers to use technology as a tool to support the educational objectives such as skills for searching and assessing information, cooperation, communication and problem solving which are important for the preparation of children for the knowledge society. Branigan (2004) stated that an effective leader needs to have the ability to develop and articulate a clear and common vision for technology use in schools; and the ability to change and manage change. Without a shared vision for e-learning and a clear strategic plan, implementation programs can be slow and difficult. A leader should be knowledgeable, competent and supportive about e-learning in order to implement an e-learning program effectively (Branigan, 2004).

Anderson and Dexter (2005) believed that leaders not only should learn how to operate technology and use it, they also should ensure that other staff in the school receive learning opportunities. Furthermore, they added that leaders should assess and evaluate academic and administrative uses of technology and make decision from those data. Therefore, it would seem that educational institutions should define clearly their e-learning policy and goals, have a detailed development plan and strategy to motivate teachers and students to utilize e-learning in their teaching and learning process.

Organizational Culture

Organizational culture is a critical factor in the success of any organizational innovation. According to Tushman and O'Reilly (1997, Cited in Martine & Terblanche, 2003), the basic elements of organisational culture (shared values, beliefs and behaviour expected of members of an organisation) influence innovation through socialisation processes in organisations. During this process, individuals learn what behaviour is acceptable and how they should perform activities. In this way, norms develop and are accepted and shared by individuals. "The basic values, assumptions and beliefs become enacted in established forms of behaviours and activity and are reflected as structures, policy, practices, management practices and procedures". (Tushman & O'Reilly, 1997, Cited in Martine & Terblanche, 2003, p.68).

Based on above explanations, it can be concluded that leaders should use strategies to develop a culture that values e-learning and improve the effectiveness of e-learning practice. Leaders should build e-learning into regular employee milestones; promote the e-learning initiative in e-mails, newsletters, etc.; use a familiar interface and focus on the desired result, and acknowledge employees who complete significant courses and rewarding them publicly or privately (Stuart, 2004).

Martine and Terblanche (2003) introduced a model and identified five dimensions of organizational culture (strategy, structure, support mechanisms, behaviour that encourages innovation and communication) that have an influence on the degree to which innovation take place. Each of these determinants is discussed to describe their influence in promoting or hindering e-learning practices in educational institutions.

Strategy (vision & Mission, Purposefulness)

According to Masoumi and Lindström (2012), effective implementation of e-learning is influenced by explicit institutional visions and goals (long-term aims that guide current practice) and a well-defined mission and strategy that describes technology's place in education.   In other words, a vision gives us a place to start, a goal to reach for, as well as a guidepost along the way" (Ertmer, 1999, p. 54). "This factor concerns how well the virtual institutions pursue their mission and goals, and to what extent they take advantage of their diverse resources in terms of managing and organizing various recourses including physical, human resources, etc" (Masoumi & Lindström, 2012,p.31).

Kotter (1996) introduced several strategy for producing successful change in organization and categorized them in three groups: The first group (i.e., establishing urgency, creating a guiding coalition, developing a vision and strategy, communicating the change vision) is designed to create a change environment and to overcome the existing status quo. The second group (i.e., empowering broad based action, generating short term wins, consolidating gains and producing more change) is designed to generate new methods of operating to support the implementation. The final group involves the process of institutionalising the change and making it a part of the organisational culture.Therefore, development, articulation, and implementation of a school vision of e-learning that promotes maximum knowledge, skills, and dispositions for every student is very important. Goals, daily activities and strategies, resources, budgets, curriculum, instruction, assessment, and staff development should be align with the e-learning vision. Leaders should develop specific and targeted plans to enhance their skills in working with and motivating teachers to use e-learning effectively in their teaching.

Structure (flexibility; freedom; cooperative teams and group interaction)

"Organizational culture has an influence on the organizational structure and operational systems in an organization" (Martine & Terblanche, 2003, p.70). If an organization believe that e-learning can surge institutional reputations, improve teaching and learning quality, and provide more flexibility in student learning, these beliefs will influence and change the organization structure and role of university and goals of graduates (Adams & Seagren ,2004).

According to Fleron (1977), implementation of a new technology is not finished with installation of the technology and explanation of how to use it. In fact, the new technology should be accepted by the receiving society (Asemi, 2006). Principals, teachers, students' cultural perceptions toward e-learning program are key factors related

to both the initial acceptance of this program as well as future behavior regarding their usage (Afshari et al., 2010). Afshari et al. (2010) carried out a study examining the factors relating to principals use of ICT.   Findings from this study indicated that principals who had positive cultural perceptions of ICT in society and school create a suitable environment and culture to the integration of technology in schools. This cultural perception relates the principals' success to their individual ability to articulate and influence norms and values. Hence, understanding the cultural values is as important as understanding the technological benefits. Principals who are responsible for adopting and implementing technology in school must be aware of its societal and organizational cultural impacts.

Support Mechanisms (reward, availability of resources)

According to Brzycki and Dudt (2005), administrative support is a critical factor in a successful implementation of e-learning. A systematic review on the use of Information and Communication Technology within an educational context was conducted by Bosley and Moon (2003) and reported that support at senior management level for implementing new practices and addressing financial implications where appropriate; involvement of several members of staff; fostering culture within schools of collaboration and mutual support; and willingness to take risks are crucial factors for technology integration in schools. Moreover, Gilbert (2000) found that adequate time for users to learn and practice the new skills; administrative support, technical support and incentives can be predictors of effective technology use in teaching and learning. Similarly, Brzycki and Dudt (2005) emphasized on the crucial role of leaders in the successful implementation of educational innovations and added that leaders should provide multiple forms of support , rewards and incentives; tie incentives to desired outcomes; supplement technical support with peer support and well trained student assistants, cultivate strong administrative support; involve faculty in decision-making to secure buy-in, and use faculty models to increase the rate of technology adoption in schools.

In addition, Buchan and Swann (2007) identified resources as an important part of technology implementation. In fact, adequate resources refer to the availability and accessibility of resources needed to implement the innovation. Resources comprise the existing infrastructure as well as an organisation's finances, hardware, software, materials, personnel, and support structures (Ely, 1999). Ali and Ferdig (2002) found that many institutions still struggled with the cost of keeping technology up-to-date such as for lab updates, improved networks, web-based course software, and video/data projection. Nearly half of the respondents in Adams' (2002) study still perceived availability of educational software, instructor computers, and student computers as barriers to integrating technology into teaching.

According to past research, Rogers (2003) stated that characteristic of an innovation as perceived by individual in a social system affect on the rate of adoption. Also, he identified five innovation attributes that may contribute to the adoption or acceptance of an innovation: relative advantage, compatibility, complexity, observability, and trialibility. The relationship between an innovation's attributes and adoption has been examined in a number of diffusion studies. For example, Afshari et al. (2009) found that the computer attributes were significantly correlated to principals' level of computer use. Afshari's study accentuated the importance of computer attributes in the process of computer adoption in developing countries. Also, Dillon and Morris (1996) stated that "innovations that offer advantages, compatibility with existing practices and beliefs, low complexity, potential triablity, and observability will have a more widespread and rapid rate of diffusion" (p. 6). Therefore, if principals and teachers perceive ICT as a beneficial tool, compatible with their current activities, easy to use and have observable outcomes, they will demonstrate positive attitudes towards ICT and use it.

Individual Factors

According to Salmon and Jones (2004), personal, university policy and practices, technological, pedagogical factors influence instructors' attitude to use e-learning. Similarly, Matuga (2001) stated that the successful design and teaching of any course hinges on the personality, educational philosophy and pedagogical style of the instructor. In fact, teacher personal will and teacher attitude towards the use of technology in teaching are a crucial element of the involvement in e-learning (Campbell, 2001). Hence, teachers should change their attitude to adopt an online mode of teaching (Mehlinger, 1995). Moreover, Rogers (2003) stated that teachers' personality traits are an indicator of their attitude to change. Those who are proactive in solving their own problems, independent, risk taker,

confident and adventurous are more likely to be self-motivated, and respond quickly and positively to the e-learning innovation than those who are more cautious, conservative instructors (Mehlinger, 1995).

According to Murray and Campbell (2000), the most important reasons behind active resistance to computer integration into teaching practices are anxiety, and incompetence (lack of skill and knowledge). In fact, teachers who have not trained to teach in non-traditional classrooms, they are unfamiliar with interactive and individualized nature of e-learning; they will not have the required skills to confidently create an exciting and challenging online learning environment. It would seem that this lack of competence and confidence in using new technology for teaching will create a certain level of anxiety. In addition, many researchers argued that student learning attitude (independence autonomy, and self-direction), personality traits (student's will to achieve, being responsible, trusting, tolerant and self-controlled) and competency in e-learning may affect their participation and performance in e-learning (e.g. Ellis & Llewellyn, 2004). Similarly, Daugherty and Funke (1998) stated that student motivation to learn, self-disciplined, accountability, and good time management skills are important factors in the successful use of e-learning. Therefore, students benefit most when they have a positive and active learning attitude and take responsibility for their own learning. Students' lack of technical knowledge and skills can hinder their use of e-learning (Jones, Packham, Miller, & Jones, 2004). Therefore, teachers and students' competency in using new technologies, their attitudes towards e-learning systems and their personality traits play an important role in successful implementation of an e-learning program.

Conclusion

Research studies indicated that online learning can be as effective as face-to-face environments in delivering instruction (Piccoli et al., 2001). "Yet, evidence has suggested that as many as 80% of the employees drop out of these programs before completion because they are inherently isolating" (Johnson, Hornik & Salas, 2008, p.356). Therefore, before designing and developing online learning program, having knowledge of the elements that influence teachers and students effective use of e-learning practice is vital. An examination of past research studies and reports on e-learning implementation in schools show that there are two main factors that affect e-learning practices in schools which are organizational and individual factors. Research on the implementation of technology in schools has also shown that these factors are interrelated. The effective e-learning implementation is not dependent of the availability or absence of one individual factor, but is determined through a dynamic process involving a set of interrelated factors (Ten Brummelhuis, 1995).

Generally, most scholars in the field of change consider change as a process instead of an outcome and emphasize on the effective leadership for the success of any change initiated (Cheung & Wong, 2011). According to Fullan (1991), the process of change consists of the three phases which are initiation (mobilization or adoption), implementation (initial use) and continuation (incorporation, routinization or institutionalization). Moreover, he stated that there are factors affecting each phase of the change process. In fact, these factors do not have equal impact during all stages of the innovation process of e-learning use in education. Hence, researchers must identify influencing factors at different stages of development. Based on this information, barriers to the successful use of e-learning can be identified. An awareness of any barrier that teachers and students face could lead to the development of solutions for overcoming these barriers.

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