THE EFFECT OF USABILITY AND COMMUNICATION ON E-LEARNING PERFORMANCE

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ABSTRACT

Today the world is making a rapid progress on the path towards the utilization of technical applications in the field of education. One of the results of this has been a lessening of the financial burden of university education through e-publication of textbooks, free material, and increasing the efficiency of university education. E-learning providing a flexible education environment is an important internet application. Compared with the traditional education, e-learning provides a similar or even better effect than that with the traditional environment. Currently there are many obstacles that reduce the effectiveness of e-learning communication such as poor usability and weak communication media. This paper aims to identify the main challenges that are facing developing countries to implement e-learning systems. In addition to that the study aims to identify the success factors factors those enhance the performance of e-learning and suggest solutions to increase the effectiveness of e-learning education environment used by Malaysian educational institutes.

Key words**:** Usability, Communication media, E-learning Performance

1. INTRODUCTION

E-learning (Electronic Learning) is the term that describe the fields of online learning, Web-based training, and technology-delivered instruction (Farah et. al., 2011). E-learning providing a flexible education environment is an important internet application (Holmes, 2006). Compared with the traditional education, e-learning provides a similar or even better effect than that with the traditional environment (Zhang et al., 2006). Moreover e-learning can be heightened as a learning experience through the use of free, open source technology that allows students to create, produce, edit, compress, and post their final academic podcasts online (Pat LeMay and Annette, 2009).

The emergence of information and instructional technologies and their influence on teaching and learning has brought about significant changes in academic environment to many countries. The new learning trend has made it mandatory to equip teachers in educational institutions with the necessary skills to cope with the new challenges (Shamsur, 2014).
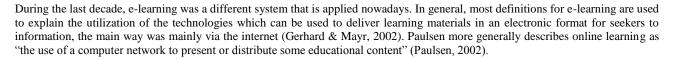
The concept and the use of e-learning were adapted in the mid 1980's by several institutes in the United States. Currently there are approximate 1.9 million learners using e-learning technologies at universities and higher education, a million of which are from Australia, New Zealand and the United Kingdom. The number of students and learners using e-learning courses is increasing all over the world at a rate of 25% each year (Ryan et al., 2004). According to Jones (2005), several universities have started making increasing use of virtual learning environments and the number of enrolled students and staffs are increasing constantly. Research conducted by Riel (2000) revealed that e-learning is now increasingly supplementing classroom learning with staff providing web resources and lecture notes online.

E-learning is a relatively new concept, during the late 1990s and early 2000s many online universities were established and more universities were offering online courses, but mixed results of E-learning systems were encountered (Gulateeet al., 2007). The studies related to this topic discussed many issues such as security, usability and cost of e-learning, the definition of e-learning also is varied between scholars,

2. THE DEFINITIONS OF E-LEANING

E-learning has been used in education as early as 1950's. At that time E-learning was referred to as distance learning (Clark, 2000). Due to a broad global attention given to e-Learning, various reports and studies had been conducted by academe, different organizations as well as the government of various nations (Rosenberg, 2001).

Currently e-Learning refers to ''the use of new multimedia technologies and the internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration'' (Holmes and Gardner, 2006). Another definition of e-learning defines the term as "the use of electronic technology to deliver, support and enhance teaching and learning. It may include all types of technology enhanced learning (TEL), where technology is used to support the learning process (Kaur K., Abas, 2004).

During the last decade, e-learning was a different system that is applied nowadays. In general, most definitions for e-learning are used to explain the utilization of the technologies which can be used to deliver learning materials in an electronic format for seekers to information, the main way was mainly via the internet (Gerhard & Mayr, 2002). Paulsen more generally describes online learning as "the use of a computer network to present or distribute some educational content" (Paulsen, 2002).

In another definition of e-learning systems as "those methods that use the internet as a delivery medium for distributing and deliver static learning resources and information (Psaromiligkos and Retalis, 2003) and most of the files was instructional files that were accessed and downloaded through an interface into interactive content environment.

Li et al., (2009) highlighted the importance of e-learning comparing to the traditional education methods which will not suit the growing need for lifelong learning, with extra flexibility needed in learning techniques and portable learning methods due to the rapid style of modern life. Roffe (2002) defined e-learning as "the way of learning and communication exercises across computers and networks or for that matter any other electronic sources". Where Fryetal (2002) define e-learning as "delivery of training and education via networked interactivity and distribution technologies".

Mohd (2008) defined e-learning as "a concept that associates learning with the application of new technologies to the learning process", While Guri (2005) defined e-learning is "the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounters" E-learning is defined as "education delivered, or learning conducted, by Web technique (Liao et al., 2008).

3. THE OBJECTIVES OF THIS STUDY

1. To identify the main challenges that are facing developing countries to implement e-learning successfully

2. To identify the success factors those enhance the performance of e-learning in developing countries

3. To demonstrate the impact of usability on the intention to use e-learning applications.

4. To understand the effectiveness of e-learning education environment used by Malaysian educational institutes.

4. THE ADVANTAGES OF E-LEARNING

The advent of the Internet in the twenty-first century has led to remarkable changes in several aspects of our lives. This advanced technology has become an essential tool of communication and information, thus offering unique advantages to both educators and students. E-Learning could dramatically increase access to higher education and training, especially for those learners who were once denied learning opportunities for any reason, such as health, distance or the like. Yet, successful implementation of e-learning requires an understanding of the issues that promote the effective use of the technologies (Khlood, 2010)

One of the greatest benefits of e-learning is that it helps to reduce the dependency on local teaching staff (Alzamil, 2006). Thus, through the use of e-learning the problem of staff shortages can be minimized because the internet allows the design of interactive course-material which is then delivered over the network to the attending students (Clark and Mayer, 2008).

In addition to that E-learning offers a flexible environment for training and learning using application of the Internet. Compared to traditional education, e-learning provides an effective learning style similar to or better than traditional ways (Holmes and Gardner, 2006).

In terms of formal education, students must attend school. They should take longer time to study because they are regulated and supervised to do learning using traditional ways. Therefore, the online learning environment, and students can learn without teachers or supervision, unlike traditional classes (Elvers et al., 2003). Other great advantages of e-learning include Syed (2009):
- Speed of acquiring information
- Quality of learning
- Reduce cost for learning
- Easy to access for information
- Ability to communicate with other learners in different country or area

5. THE CHALLENGES IN IMPLEMENTING E-LEARNING IN DEVELOPING COUNTIES

E-Learning is becoming increasingly significant in higher education. More universities are gradually employing e-Learning into their educational programs, these factors are critical in creating a successful environment for e-Learning. Marlia, (2008) emphasized on the need for change and stressed that it was not only for e-learning strategies in Malaysian higher institutions, but more generally for enhancement of teaching and learning in order to encourage the diffusion of good practices

Uhomoibhi (2006) found that the implementation of e-learning included many approaches by the organizations, to strengthen the traditional face-to-face courses with support of new communication technology, enhancement of experience with in traditional courses by integration of online activities. The researchers added that e-learning system implementation is dependent on the level of availability of some influential factors like budgeting, infrastructure planning, human resource development and learners skills and attitude towards the technology, while (Jung, 2003; Khan, 2005) identified three key areas products involved in e-learning implementation, people and process are all dependent on integrated team approach Process management of e-learning encounters delivery, designing, evaluation, maintenance and designing stages. Products of an E-learning are the deliverables which includes project plan and content development (Khan, 2005).

The challenges of implementing e-learning to a country new to this technology or has a poor technical infrastructure should be examined and help the researchers in this field to conclude the right solutions for swift implementation. Olof and Daniel (2012) have pointed out that e-learning has the potential to raise the average educational level in developing countries, there are challenges that can hinder the diffusion of e-learning in developing countries, while Omidinia et al., (2011) focused on the challenges associated with the government agencies in the developing countries, they indicated that the lack of qualified personnel, and financial support from government institutes and poor planning for electronic systems is one of the main challenges facing the implementation of e-learning in the developing countries. Omidinia et al., (2011) found that one of the main challenges facing the adoption of e-learning technology is that most of the technologies of e-learning systems and the designs of applications may not be suitable to any country because the development of these systems was in a developed country with strong technological background like US and UK, however improper adoption to e-learning may lead to big obstacles when trying to implement e-learning applications and systems in a developing countries or a country which is completely new to the concept of e-learning.

Masoumi, (2010) concluded that a lot of the institutions in the developing countries lack a strategic or technological plan, which makes the process of e-learning more difficult. Masoumi, (2010) added that if the educational institute depends on specific persons instead of a well designed plan, the existing of such situation will make the process of e-learning high dependent on personal attitudes on personal basis of that person's whether he/she likes and dislikes this way of learning.

Marlia, (2007) has analyzed the development of the e-learning strategies that have been used in Malaysian public universities since 1996 through two case studies at University Kebangsaan Malaysia (UKM) and University Teknologi Malaysia (UTM), the researcher found that most of the challenges to apply e-learning strategies in the public universities are similar to attempting to adopt IT strategies university-wide. The study suggests that the Malaysian public universities have not been successful to generating senior leadership capable combining the diverse university plan and strategies, these cases are increased because of work environment that are lack encouragement, fear of intellectual piracy, inadequate technical training, insufficient equipment and no incentives for innovation. Based on the above, the research summarizes the following main challenges of e-learning in developing countries:

1. Poor technological infrastructure
2. The lack of government support to e-learning in educational institutes
3. Educational institutes do not provide latest application of e-learning in their classes
4. Most of the e-learning systems and applications used in classes are not suitable to the educational environment of developing countries ad student capabilities in these countries, in particular the interface and language.
5. Most of current e-learning systems are developed in countries with strong technological background such as US and UK, which might be difficult to implement in a country with poor technological infrastructure
6. Lack of strategic or technological plans
7. Inadequate technical training for operator of e-learning systems
8. The educational institute in developing countries depend on specific persons instead of a well-designed plan, the existing of such situation will make the process of e-learning high dependent on personal attitudes on personal basis

6. THE SUCCESS FACTORS THAT AFFECT THE USE OF E-LEARNING

Scholars found many factors that affect the use of e-learning. One of these factors is self perceptions about e-learning. Researchers concluded that the variability in perceptions was highly dependent upon how the user perceived the technology in terms of usefulness and self-efficiency (Abouchedid & Eid, 2004).

Liaw ea al., (2007) found that technological self efficiency, perceived usefulness, and behavioral intention among users were the main determinants of concurrent perceptions to use e-learning.

Another important factor is perceived enjoyment, which is defined as "the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from such use" (Vankatesh, 2000: p. 343). Perceived enjoyment is an important factor and shows that the inherent motivation is strongly influences and affects the decision to acceptance of new technology, and by providing fun and pleasure in learning style through the use of the new technology, e-learning could be more accepted by students and frequently used. Shirley (2002) explained that perceived enjoyment is the intrinsic motivation that is dependent upon the user's perception the pleasure derived from using the computer in e-learning. Shirley tested the above variable based upon the assumption that it had an impact on faculty members' perceptions of e-learning adoption.

Perceived usefulness is another important factor that control the way users determine their intentions to use a new technology for learning (Davis et al., 1989). Therefore, e-learning shows that the perceived usefulness has a positive influence on users' intentions to use e-learning as a new technology for learning and will let learners continue to learn using this technology. Abouchedid and Eid (2004) defined perceived usefulness of e-learning as "the type of perceptions (attitudes) on the essentiality of a particular technology in the performance of a particular job, which in turn determines that person's attitudes".

Panda (2007) argues that faculty perceptions of using new technology for learning can be made better by integrating the available technology with course work provided to faculty members. A significant aspect in this regard is that faculty members can teach in the same way as they have been educated. It is very true that computer proficiency cannot be transferred to learners until faculty members adopt a positive attitude toward e-learning

Liaw (2006) has raised questions about whether learning institutions will be able to meet the requirements of a diverse student population and of adopting e-learning as an additional mean to teach students.

Ahmed (2012) examined perceived self-efficiency of faculty perceptions of e-learning and found that the use of e-learning by instructors is explained largely in terms of their perceptions about the value they get from e-learning systems. The concept of computer self efficiency is derived from Bandura's (1986) self-efficiency construct that relates to a person's ability to use computers.

Based on the above, it is evident that teachers and lecturers who perceived e-learning as useful way for learning were likely to change their intentions and subsequent attitudes to adopt the system positively and then benefit from the e-learning positively.

Based on the above the researcher specifies the following factors that most influential to the implementation of e-learning in educational institutes:

- Poor usability
- Weak perceived Ease of Use
- Behavioral Intention to Use e-learning
- The lake of internet and technology infrastructures
- Limited experience to use information system
- Weak flexibility of e-learning systems

However, without understanding these factors and their impact on using e-learning, it would be hard to encourage learners to use e-learning for education and replace traditional learning methods (Cheng-Ying, 2012). This study argues that usability is one of the most influential factors that affect the intention to use E-learning, the following section defines usability and its effect on E-learning.

7. USABILITY OF E-LEARNING

Usability is defined as "the ease of use and learn ability of a human-made object" (Holm, 2006). The object of use can be a software application, information system, book, tool, machine, process, or anything a human interacts with. A usability study may be conducted as a primary job function by a usability analyst or as a secondary job function by designers, technical writers, marketing personnel, and others. It is widely used in consumer electronics, communication, and knowledge transfer objects (such as a a document or online help) and mechanical objects such as a door handle or a hammer (Wickens, 2004).

Usability includes methods of measuring the interface of information system. In human-computer interaction and computer science, usability represent the elegance and clarity of a computer application and its design. Usability differs from user satisfaction and user experience because usability also considers usefulness (Karwowski, 2011).

Izabela (2011) investigated usability testing provided insights into detailed interface issues and the type of content and journey that users prefer when making a purchasing decision, while heuristic evaluation was mainly directed at overall user interface and interaction factors. She found that information system aspects that are characterized by poor usability do indeed hamper users' overall experience. When inconsistent navigation structures, product-based navigation menus, hard to understand functionality, and poor presentation of content offerings were encountered, therefore, good usability enhanced the quality of the overall user experience.

It is suggested that the interface design of current electronic shops needs to be improved. The most significant and common usability problems were found to lie within the boundaries of the heuristics 'User Control and Freedom' and 'Help and Documentation'. For

example, with regard to user control and freedom, they found users were not free to sequence their own tasks, and undo and redo functions were not supported (Sherry and Robert, 2005).

Roy (2010) investigated the usability by measuring the nature and extent of errors in applications as diagnosed by two automated evaluation tools and how the information systems. They conclude that although the errors recorded by the two automated tools hinder accessibility by people with disabilities and the elderly, they will not affect the great majority of application users. However, it will nevertheless lead to a loss of some customers who would find the information systems inaccessible and unusable.

Karvonen et al. (2011) found that both Finnish and Swedish users declared that they liked designs that were "clear" or "clean" and "simple". In practice, this meant that the designs were text-based and on rich information, also quick and swift navigation, with less advertisements, and preferably no animated banners. Left-hand side navigation aids were mentioned by some Swedish users as pleasant and easy-to-use according to the survey conducted by them.

According to the findings of previous studies, the researcher summarize the following dimension of usability:
1. Interface design
2. User control
3. Simplicity of design
4. Navigation
5. Less advertisements

Based on the above, it is shown that usability is an important factor that determine the efficiency of e-learning. However, e-learning application with high level of usability is much interesting to the learners and may increase their spending time using e-learning applications.

8. CONCLUSION

This paper shows the importance of e-learning for educational institutes and shows that e-learning play the most vital role in building the future of learning in many developing countries, and without developing and adoption of new education methods; the educational institutes of may face a wide gap with other institutes in developed countries. Many studies found that e-learning is a very affordable teaching method, and saves the time of students by deployment of information technology in educational materials, cultural, social and economic benefits.

This study shows that developing countries are facing major challenges to adopt e-learning successfully like other developed countries such as United States and Europe, where most of the e-learning systems and applications used in classes are not suitable to the educational environment of developing countries ad student capabilities in these countries, in particular the interface and language. Moreover, the current e-learning systems are developed in countries with strong technological background such as US and UK, which might be difficult to implement in a country with poor technological infrastructure. It is also found that developing countries lack of strategic or technological plans and have inadequate technical training for operator of e-learning systems

All the previous related work that have been discussed about the implementation and development of e-learning in all educational organizations belong to government and public sector, and each of the related work was done using almost the same or similar factors such as usability, attitude, perceived usefulness, and the intention to use e-learning as a new method for learning.

Finally the result of this paper shows that the intention to use e-learning by learners affected by different factors such as usability and the way of communication using the system. Usability is a very important factor that affects the perception of users to e-learning. It is found that poor presentation of content in e-learning application is very important to enhance the experience of users with the applications of e-learning; therefore, good usability enhanced the quality of the overall user experience.

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