Students' Readiness and Perceptions towards Mobile Learning and their Acceptance in Adopting Mobile Learning Platform as Learning Tool and Communication Tool

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A thesis submitted in fulfilment of the requirements for the award of the degree of Master of Education (Educational Technology)

UNIVERSITI TEKNOLOGI MALAYSIA

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Specially dedicate to my beloved family
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ABSTRACT

Mobile Learning is the current technology that has become more and more popular nowadays. Mobile Learning is a type of learning across contexts and learning using small, portable and wireless computing devices like PDA (Personal Digital Assistance) and smart phone. The purpose of this research is to collect data from postgraduates about Mobile Learning and to develop a local context mobile accessible learning webpage. The first stage survey is to investigate the readiness and perceptions of postgraduates towards the Mobile Learning. This quantitative method was constructed by using a set of questionnaire which involves 63 respondents from Educational Technology Course, Faculty of Education. Results indicated that most of the postgraduates are ready to use mobile device especially in searching information through the online browser (mean value= 4.43). Besides that, results also showed that they have a positive perceptions towards Mobile Learning especially when they agree that learners can get the latest information through it (mean value= 4.44). A Mobile Learning environment (Mobile Moodle) which is connected with Learning Management System (LMS) was developed based on the postgraduates’ preferred activities. Second stage survey which is Mixed-Method survey was carried out to examine the postgraduates’ acceptance in adopting mobile learning as an additional learning tool and communication tool. A set of questionnaires and interview sheet were used in collecting data. The research’s results had signified that the acceptance among postgraduates are high especially on the benefit of Mobile Learning which allows learner to access lecture materials anywhere and anytime (mean value= 5.00). In addition, results also indicated that postgraduates prefer to carry out communication with lecturer by using Mobile Learning environment (mean value= 4.71). Lastly, refering to Technology Acceptance Model (TAM) the research results showed that Mobile Learning environment’s usefulness (mean value= 4.08) and the ease of use (mean value= 4.06) are the main concerns considered by postgraduates.
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INTRODUCTION

1.1 Introduction

The rapid development of information and communication technologies (ICT) during the past two decades has placed new demands on expertise, and also leading to increase the use of information technology (IT) especially for instruction and learning process. The development of technology enables our country growing approach the flexibility in education field and hence meets the country's drive to fulfil Vision 2020.

Our education curriculum had transformed and enhanced by the use of new media as tools. E-learning was introduced in Malaysia higher institutions since year 1998. The rapid growth of web-based technologies and the high usage of the internet had made teaching and learning via the internet more viable (Chai and Poh, 2009). E-learning provides the learning opportunities anytime and anywhere by using the interactive network technology and computers in computer lab to deliver the learning materials to learner. E-learning actually integrates all forms of online instructions using electronic devices.

Almost all the higher education institutions promote the life-long learning and the distance education. Distance education takes place when a teacher and students are separated by physical distance and usually technology is used for bridge the instructional gap. Technology supports on teaching and learning enable the flexible delivery of education anytime and anywhere. Hence, many universities in Malaysia
provided an E-learning portal for a teaching medium purposely for long distance education and off-campus programs (Khalid, 2006; Chai and Poh, 2009).

The E-learning environment also provides students a place for interaction electronically with each other or with instructor in some activities like forum, discussion board, email and chat rooms. This way of learning enable learner to express their idea or their new finding information from internet (Brandl, 2005; Bajahzer et al., 2008). Moodle (Modular Object Oriented Dynamic Learning Environment) is an open source Learning Management System (LMS) which is the number four famous product for E-learning. Moodle is confirmed able to increase student confidence before exam by connecting individual course together and sharing materials with each other. Besides that, it allows teacher to provide and share document, graded assignment, quizzes within this quality online course.

The earlier E-learning is restricted to computer lab’s computer and cabled internet services. However, since 2000, the advance in information technology and computing had provided another learning concept by using the portable PCs like notebook with wireless LANs. But now, education is being transformed by the use of wireless mobile technologies into Mobile Learning where this flexible method is unbounded by space and time.

1.2 Background of Problems

The rapid development of mobile devices in the information age matches with the trend where the information can be achieved at fingertips and independency of time and location. Mobile Learning (M-Learning) is emerging to be the next generation of E-learning.

"State of the internet....... Mobile will be bigger than Desktop Internet in 5 years"

(Morgan, 2010)
Morgan (2010) believes that more users will be likely to connect to internet via mobile devices than desktop devices within 5 years. Hence, researcher should start to explore the potential in mobile device and using the advantages of mobile device in creating a portable and affordable learning for all learners.

Actually, Mobile Learning is a part of learning technologies which combine mobile technologies and E-learning, it delivers E-learning materials and provide learning environment on mobile devices such as mobile phone, PDA (Personal Digital Assistant) and other devices (Mariam and John, 2008). Mobile Learning can offer small and consumable learning contents which can be delivered through wireless network to all mobile devices (Saipunidzam et al., 2010).

Nowadays, the use of mobile phones and handheld device among students in western country has dramatically increased. Mobile technologies offer capabilities that can support SMS based system and some advance mobile wireless device can support web based system. There have been a number of systems developed by western country where the mobile device is used in supporting the classroom interaction between teacher and learner. One example is the computer science program at the University of Minnesota, Duluth where it had already picked the pocket PC platform to support two functions: reference materials and exercises for students. Students can use the device as portable textbooks and easily offering information usually contained within bulkier, more expensive book forms (Alexander, 2004).

According to New Media Consortium and Educause (2006), teachers in higher education in the United Kingdom have made use of SMS (Short Messaging Service) as prompts for course requirements, polling classes and pop quizzes with some universities experimenting with phone exams where the users’ voice print identifies them as the test taker. Similarly, mobile phones used as support mechanisms to remind students about assignment submissions and course enrolments (Gayeski, 2007; Herrington, 2007).
The Mobile Learning in Malaysia is still considered a new trend and not yet widely used in higher education. In Malaysia, LTT Global Communication, which is a private company based in Petaling Jaya, establishes its own business product that is based on mobile E-learning English language. LTT Global Communication has built up a case for using mobile phones in education where they applied it in teaching and learning English language. This product’s name is SMS-ME-ENGLISH, which works over SMS, and students will receive text messages that can help them in learning the language. This application can be classified as a learning application for adult learners (Kasminder, 2007; Poon and Koo, 2008).

Another mobile application produced by Universiti Teknikal Malaysia Melaka (UTeM) is Mobile Learning Notes for SPM Sejarah “Islam Di Asia Tenggara”. This learning application needs to be installed in mobile device and it enables learning everywhere because mobile phones are carried by anyone everywhere (Abd Wahab, 2008). Besides that, UTeM also produced another Mobile Learning application which enables 8-10 years old children learn mathematics using mobile phone. The content of the project is to teach the student on how to memorise the times table using accelerated learning techniques (Hashim, 2008).

M-learning advances than E-learning in term of accessing learning content anytime and anywhere. The Learning Management System (LMS) used for E-learning will become better if integrated with mobile services for mobile device. Moodle is one of the Open Source Software (OSS) which almost free to download, to use, modify and even distribute under the terms of licence. This free open software was widely adopted by universities and educational institutions for E-learning purposes. Teachers can provide and share documents, quizzes, discussion forums to students (Dougiamas, 2007; Bajahzer et al., 2008). According to a research done by Houser and Kinjo (2005) the Moodle usually designed for large screen desktop and laptop is perfectly used by learner. But a lightweight version of Moodle with small screen has not yet been developed for helping students access to learning materials in lecture classes.
Meisenberger and Nischelwitzer (2004) stated that traditional E-learning with their Personal Computer (PC), notebook or laptop cannot give a real independency of time and space because it is hard for everyone to bring their notebook or their Personal Computer (PC) with them all the time. The real independency in time and location according to Sharples et al. (2005) is that the process of learning is regardless of time (whenever) and place (wherever) where a learner can access to his learning materials.

Besides the independency problem, nowadays many universities are implementing some technologies that allow students to access learning course materials on wireless devices. But most of the learning materials or lectures note can be accessed by using E-learning methods. Mode of delivery should shift to M-learning (Georgieva and Trifonova, 2006). He also stated that students’ usage of E-learning will increase their interest to M-learning. Hence, Mobile Learning applications together with learning platforms are required so that student has a chance to access learning course by using mobile device.

Although learner can access for their own necessary information or interact with their lecturer by using laptop computer or desktop computer; a small, handy, always with the user and able to connect to internet mobile device will replace those immobile devices. For now, not all the activities and teaching materials used in E-learning system are suitable for mobile delivery. There still lack of some online learning platforms for mobile device user since the percentages of mobile device holder become higher and higher.

One of the advantages of E-learning is students are able to communicate with their instructors and each other, access learning materials and submit assignments using the power of internet (Paulus, 2009).). Interactivity and communication between lecturer and students in a classroom are very important. The learning process is achieved when there are a lot of active involvements between students and their lecturer (Krause & Effelsberg, 2003; E Costa et al., 2008). Actually, lecturer-student contact in and out of the classroom is very important in building student’s motivation and involvement in class. But, sometime because of time constraints,
some lecturers do not encourage interaction between students and lecturer. Besides that, some students feel shy to ask question in front of a large audience and cause the communication fail to occur.

There are many advantages of applying Mobile Learning in higher education and more and more universities start to implement the new technology. A research was done by Jacob and Issac (2007) on students’ perception on Mobile Learning in higher education campus. The finding shows that majority of student support that wireless networks increase the flexibility of accessing to resources in learning by using palmtop, mobile phones and PDAs.

Besides that, another advantage of Mobile Learning is it can be a new educational tool. Douglas et al. (2008) carried out a survey about the effectiveness of HotLava Software’s Learning Mobile Author in improving learning outcome. The finding shows that this mobile phone application can make a significant in students learning outcome and hence can be used as one new learning tool in education.

Because of the advantages of Mobile Learning, more and more research has been carried out on the effectiveness and acceptance level of Mobile Learning among students. Research done by Joseph and Maria (2007) is a survey on the students and faculty’s readiness for Mobile Learning. A total of 94% of students indicated their readiness for Mobile Learning because all of them own a cell phone or smart phone. About 60% of faculty also affirmed their readiness for Mobile Learning. Researchers also stated that faculty can implement Mobile Learning in their online course by adding or making more learning content and information in the form of easily accessible by using mobile phones.

There are many benefits of plugging mobile technology into E-learning system as potential for increasing productivity within the scope of the new M-learning paradigm (Wierzbicki 2002; Poon and Koo 2008). The educational field changes its paradigm from teacher-centered learning to learner-centered learning under informatics world. However, what are the perceptions among local university’s
students toward Mobile Learning? Are they ready to use their mobile devices for a space and time unbounded learning? Mobile Learning is a unique and special approach and hence a movement toward mobile age is a need.

1.3 Statement of Problems

The emergence of Mobile Learning is not to replace the E-learning method, but act as another learning method which is used to improve learners’ learning experience. The Mobile Learning scenario is still ‘young’ especially in the developing country like Malaysia. Learners still carry out their learning when there is a computer or laptop and internet service. They fail to learn at any time and everywhere they are. Mobile Learning can bring many benefits and thus there is a need to develop a Mobile Learning environment with Mobile Learning materials. Mobile Learning situation can firstly be implemented in local university and hence provides a higher level of support for learner to adopt the usage of mobile device as an additional learning tool and communication tool.

E-learning system can integrate into regular curriculum by using LMS and provide a communication platform between instructor and learner. Now, mobile can access to LMS like Moodle and provide extra special such as portability, social interactivity, context sensitivity and individuality. But the adoption of LMS by using mobile devices is still new and not much developed by instructor for learning purpose. Hence, there is a need to expand the capabilities of Moodle so that it can be served as Mobile Learning platform which can support online interactive learning and various activities.

This project aims to collect data about the readiness and perceptions of postgraduates in Higher Public Learning Institution (IPTA) toward the concept of Mobile Learning. Besides that, an online Mobile Learning environment or called as mobile Moodle will be developed in order to provide a series of learning materials to be accessed by mobile devices especially mobile phone. Lastly, a survey will be
carry out to survey the acceptance level among postgraduates in adopting Mobile Learning as an additional learning tool and communication tool for educational purpose. Technology Acceptance Model (TAM) will be used to collect data about the perceived usefulness and perceived ease of use towards mobile Moodle.

1.4 Objectives of the Research

The objectives of this research are:

(i) To study the postgraduates’ readiness towards the usage of Mobile Learning based on their preferred activities on mobile device.

(ii) To study the postgraduates’ perceptions from the aspect of their concepts about Mobile Learning.

(iii) To develop Mobile Learning environment (Mobile Moodle) which connect to a Learning Management System (LMS) based on postgraduates preferred activities.

(iv) To develop Mobile Interactive Learning Object (MILO) for Mobile Moodle.

(v) To evaluate postgraduates’ acceptance in adopting Mobile Learning as
   a. an additional learning tool
   b. a communication tool for learning purposes.

(vi) To examine the postgraduates’ intention to use Mobile Learning environment (Mobile Moodle) based on the main constructs of Technology Acceptance Model (TAM):
   a. Perceived Usefulness
   b. Perceived Ease of Use
1.5 Research Questions

The research questions of this research are:

(i) Are the postgraduates ready towards the usage of Mobile Learning based on their preferred activities on mobile device?

(ii) What are the postgraduates’ perceptions in term of their concepts towards the Mobile Learning?

(iii) What is the postgraduates’ acceptance in adopting Mobile Learning as an additional learning tool for learning purpose?

(iv) What is the postgraduates’ acceptance in adopting Mobile Learning as a communication tool for learning purpose?

(vii) Are the postgraduate’s intent to use Mobile Learning environment based on Perceived Usefulness and Perceived Ease of Use according to Technology Acceptance Model (TAM)?

1.6 Theoretical Framework

Theoretical framework for this research is about the readiness and perceptions of postgraduates toward the usage of Mobile Learning. This study is started with the analysis of postgraduates’ readiness based on their daily activities on mobile device and their perceptions about the concepts of Mobile Learning towards the usage of Mobile Learning in education field. This survey is carried out by using questionnaire.

An online Mobile Learning environment (Mobile Moodle) and learning materials are selected and determined. The learning materials for Mobile Learning process are designed based on the principle of Mobile Interactive Learning Objects (MILOs) from Holzinger et al. (2005). The characteristics of MILO are as follow:
i. Must contain less information than traditional learning object (LO)
ii. Allow user to stop learning abruptly
iii. Provide discovery learning environment
iv. Small and simple information
v. Fix on mobile device’s screen

The Mobile Learning environment which contains all learning materials is build by connecting Mobile Learning environment with Learning Management System (LMS). The Mobile Learning Engine (MLE) is an open source plugin and used together with Learning Management System especially Moodle platform to enable the broad variety of mobile devices can run on it.

The Mobile Learning environment is designed to meet the Social Constructivism learning pedagogy which is fully supported by Moodle platform. Besides that, the Mobile Learning users are encouraged to involve in this interactive and experiential learning where the users can build new knowledge upon the foundation of previous knowledge after interact with the learning materials provided there. The learning materials provided are support the constructivist learning philosophy.

During the implementation process, Mobile Learning environment is tested by using mobile device. Lastly, an evaluation process is carried out to collect data about the postgraduates’ acceptance in adopting Mobile Learning as an additional learning tool and communication tool. Besides that, Technology Acceptance Model (TAM) by Davis (1989) is adopted to determine the factors that influence postgraduates' intention to use Mobile Learning. The TAM has two main beliefs:

i. Perceived Usefulness
ii. Perceived Ease of Use

According to Davis (1989), both perceived usefulness and perceived ease of use have significant impact on user attitude towards using of Mobile Learning environment; hence it is suitable to be used for the this survey. The reason is if an
individual perceives the system to be easy to use, he or she is more likely to perceive the system to be useful also (Morris and Dillion, 1997; Sek et al., 2010).

The whole research use the ADDIE instructional design model (Molenda et al., 2003) as a guide. The 5 phases of development in ADDIE model are Analyse, Design, Development, Implementation and Evaluation. The whole theoretical framework is shown at Figure 1 below:
3. Develop Mobile Learning Environment

4. Implementation by using mobile phone

5. Evaluation phase

Figure 1.1: Theoretical Framework

1.7 Rationale of the Research

Mobile Learning can also be called E-learning through mobile and hand held devices using wireless transmission (Bhaskar and Govindarajulu, 2008). The growth of E-learning and implementation in education are still at a steady growing rate and most of the students already knew how to use E-learning in enhancing their learning.
E-learning cannot give a real independency in term of time and place to users. The limitations in E-learning are now can be enhanced by using Mobile Learning. Mobile Learning or called as M-Learning is the one step advance learning style than E-learning in Malaysia and it offers another way to deliver small and consumable byte learning materials for learner and hence enable learning anywhere and anytime (Liang, 2005; Saipunidzam, 2010).

Besides that, Mobile Learning can increase the interactivity and communication between lecturer and students. M-Learning is the current technology that used to resolve the challenges from traditional learning (Sahilu et al., 2010). Hence, the purpose of this project is to provide another learning environment for local Higher Public Learning Institution (IPTA) students. They can access the learning platform with the aid of mobile devices like smart phones, PDAs and iPhones which are able to connect to wireless networks.

1.8 Significance of the Research

This project will bring benefit to:

1.8.1 Campus learner

Many universities’ students will bring along with them one or more mobile computing devices such as smart phones, PDAs or laptops. The Mobile Learning environment enables them to carry out the learning process anywhere and anytime (Bhaskar and Govindarajulu, 2008). The time usually spent in waiting transport or any other activities can be used for learning and they will get the instant news or information because the mobile device is always with them.
1.8.2 Lecturer

The communication between lecturer and students is very important but the conventional learning style provides a unilateral communication between them (E Costa et al., 2008). Mobile device with online learning environment is able to solve the communication problem and enhance teaching and learning process because this platform enables lecturers to get feedbacks instantly from their student.

1.8.3 University

The use of Mobile Learning in University is a good starter and it is better than the traditional face to face instruction learning, paper based distance education learning or traditional E-learning. It is possible that most of the universities in the world applying the anytime, anywhere concept in their education due to its ability to support ubiquitous learning via mobile technologies (Abas et al., 2009). Mobile Learning also a powerful method for engaging learner especially for distance learning learner which face-to-face meeting is very limited.

1.9 Scope and Limitation of the Research

This research is about the development of online Mobile Learning environment and Mobile Learning materials. This Mobile Learning environment can be accessed by using mobile devices such as smart phone, PDA and iPhone. In this survey, the use of mobile devices limited to internet-enabled mobile phones only.

Students can access to learning environment for an educational activity. The Mobile Learning environment is designed generally for students in University especially postgraduates who are taking Educational Technology course at Universiti Teknologi Malaysia (UTM).
Before the development of Mobile Learning environment, the perceptions and readiness of postgraduates towards Mobile Learning will be collected. In this study, a set of questionnaire will be used to collect data from them. The respondents are those Educational Technology's postgraduates who are studying in Universiti Teknologi Malaysia.

After the development of Mobile Learning environment, a survey will be carried out to collect data about the acceptance level of Mobile Learning among campus postgraduates. The scope of contents for learning materials in mobile phones study is focused on a subject in Educational Technology Course (MPP) - Video and Animation Technology Production (MPT1383).

1.10 Definition

The definitions of some terms that are used in this project are as follows:

1.10.1 Information and Communication Technologies (ICT)

Information and communications technologies (ICT) are a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information (Blurton, 2002).

1.10.2 Mobile Learning (M-Learning)

Mobile Learning refers to the usage of information technologies' tools such as PDAs, cell phones, tablets PC and laptops in learning and teaching process. The Mobile Learning exits due to distance learning and electronic learning (Tamimuddin, 2007).
1.10.3 Electronic Learning (E-learning)

E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include online learning, virtual learning, distributed learning network and web based learning (Som Naidu, 2006).

1.10.4 Learning Management System (LMS)

Learning Management System (LMS) is a software application that automates the administration, tracking and reporting of training events, classroom events, e-learning programs and some training content (Ellis, 2009). LMS can be used as a tool to provide students with external access to various resources like handouts, links and software.

1.10.5 Moodle

Moodle is an open source Learning Management System (LMS). The word Moodle was originally from an acronym for Modular Object-Oriented Dynamic Learning Environment. Moodle is open to register users and offers the possibility to develop forum, wikis, quizzes, surveys and other interactive in built activities. The design of Moodle is based on Social Constructivism pedagogy (Martin Dougiamas, 2003).

1.10.6 Mobile Learning Engine (MLE)

The Mobile Learning Engine (MLE) is an open source plugin for Moodle that adds the functionality of a Mobile Learning environment to Moodle. User can use their mobile device to access MLE-Moodle on their built in mobile browsers or through a special mobile phone application (MLE- Moodle, 2009).
1.10.7 Mobile Interactive Learning Objects (MILOs)

Mobile Interactive Learning Objects (MILOs) is a practical approach to Mobile Learning which can be used within a Mobile Learning Engine (MLE) that runs on mobile phone as learning information. The mobile interactive learning objects are interactive, adaptable and used to achieve educational objectives (Holzinger et al., 2005).

1.10.8 Technology Acceptance Model (TAM)

TAM is a specific model developed to explain and predict user's computer usage behaviour. TAM specifies the causal relationships between system design features, perceived usefulness, perceived ease of use, attitude toward using and actual usage behaviour (Davis, 1993).

1.11 Conclusion

The rapid development of information and communication technologies together with the increasing number of learning tools in education field had change the conventional teaching and learning process to a new educational platform. The traditional E-learning world provides online learning opportunities by delivering the learning materials to learner where the learners can access them using personal computer, laptop or notebook. This learning style cannot give a real independency for learner to obtain information anytime and anywhere.

The solution for this situation is by applying Mobile Learning among learners where they can access to online learning by using their own mobile devices like smart phone. Plugging mobile technology into E-learning has potential for increasing productivity and form a new scope of M-Learning paradigm.
In this study, researcher wants to know the readiness and perceptions of students especially postgraduates in local university before developing the online Mobile Learning environment. The Mobile Learning environment will consist of online learning materials and learning activities. This project can bring out huge benefits especially for postgraduates because they can carry out their learning anytime and at anyplace only with their own mobile devices. The literature review about Mobile Learning and the theory of learning will be discussed in next chapter.
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