INTERNATIONAL CONFERENCE ON TEACHING AND LEARNING IN HIGHER EDUCATION (ICTLHE 2011)

Equatorial Hotel Malacca, 21-23 November 2011

Mobile Learning in Malaysian Technical and Vocational Education (TVE): A Qualitative Case Study

By

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ABSTRACT

Mobile learning is not learning through mobile phones or learning over a wireless connection even though the capabilities of running multimedia features has increased in recent years. But mobile learning is the evolution of e-learning, which completes the missing component of an e-learning solution. Mobile learning most suits for those mobile parties in education institutes. So, utilizing mobile devices in education is mainly considered as enhanced tools. Innovations in mobile learning can lead to a change paradigm in education which mobile technologies are believed to have the potential to be used in teaching and learning in schools. This paper discusses the feasibility of employing mobile phones for mainstream schooling in Malaysian Technical and Vocational Education and Training (TVET). The paper describes the various perceptions of the use of mobile phones for learning by reflecting on the positive opinion from educational researchers around the world, including Malaysia. Current initiatives in the use of mobile phones for mobile learning are explored. Beside discuss about the advantages, disadvantages and tools for mobile learning this paper also explore about the possibilities using mobile learning in technical and vocational mainstream.

Keywords: Mobile Learning, Technical and Vocational Education, Mobile Device, Instructional

1.0 INTRODUCTION

In the era of globalization, we cannot escape from the growing sophistication of technology. One of the education developments at present is the e-learning activities in which learning occurs through the internet, without network or network system using electronic technology. Advances in internet technologies and applications make open and distance learning a fully viable alternative to traditional education, creating a natural environment for the development of effective virtual learning communities. The growing need for educational access leads students rightly to demand culturally adaptive learning experiences that allow full development of the individual (Visser, 2007). Nowadays, electronic technology has led to growing use of wireless and mobile technology. This indirectly has an impact on teaching and

learning process. Development of wireless technology and mobile communication devices has also contributed to the use of mobile devices in education. Thus, the concept of mlearning was introduced as an alternative to the learning activities. This research paper will also discuss about the way in technical and vocational education students learn technical skills through the m-learning. This paper will provide preliminary information to the teachers and students in the Vocational School, how technology can be used in teaching and learning technical skills.

Technical and vocational education is one of the most important educations for human resource development, particularly for the delivery of skilled and semi-skilled workers. Thus, in addition to the Ministry of Education is providing technical and vocational education through forrmal education. There are other government agencies that provide non-formal training outside the formal education system established by law. It aims to train youth and adults for certain jobs or to acquire specific skills. Among the government agency that provides vocational education and skills training are the Ministry of Human Resources, Ministry of Youth and Sports, Ministry of Agriculture, Tenaga Nasional Berhad (TNB) and Majlis Amanah Rakyat (MARA).

Training services provided by the Labour Department under the Ministry of Human Resources has responsibility for managing and implementing training programs and provides consulting services and other services to the company if necessary. Malaysia aims to enhance the value to become high-income economy. Thus, enrollment in technical and vocational education and training (TVET) should be increased and the overall quality of training significantly enhanced to improve workforce skill levels.

TVET aimed at increasing the supply of skilled human capital in Malaysia through the provision of quality education to students who have the propensity and ability in technical and vocational fields. Lead to the provision of technical and vocational skills that can be used immediately in the job market. Technical and vocational education become a prime choice in many developed countries. Binary or dual flexible educational model paths used in many high-income countries. This model allowsstudents to change the flow between the academic and the vocational equivalent has career prospects.

The average enrollment rate of students entering technical and vocational stream at the upper secondary level for the Organisation of Economic Cooperation and Development (OECD) was 44 percent compared to only 10 percent in Malaysia. Improvement opportunities, access and quality of technical and vocational to technical route is as important as the improvement of tertiary academic route.

Dual-path approach to ongoing education will give students the opportunity to change the flow of technical and vocational with academic as shown in technical and vocational education in secondary schools, which has two main flows of technical and vocational educational education. Technical flows have more academic and vocational components have more hands-on component. Technical and vocational skills or direct benefit to employers, employees and related industry sectors. Benefits dependent on the combined skills of workers.

Therefore, the cost of TVET funded jointly by government, employers, industry and students based on interest earned. During Tenth Malaysia Plan (RMK-10), te following four strategies will be adopted to mainstream and expand access to quality TVET:

- Improve the perception of technical and vocational and attract more students.
- Develop technical and vocational teaching more effective.
- Enhance and harmonize the quality of technical and vocational curriculum in line with industry needs.
- Streamlining the delivery of TVET.

There are many opportunities for public and private providers of technical and vocational school leavers who are not attractive to pursue their studies to pursue technical and vocational training and increase the number of skilled workers in the labor market. For this purpose, emphasis will be given to increasing the value and attractiveness of technical and vocational students, training providers and industry.

Publicity intensified in the 10th plan period, national media campaign will be implemented on an ongoing basis increase awareness and perceptions of technical and vocational improvement. The main target groups are potential students and their parents. The campaign will emphasize the benefits of entering the labor market with technical and vocational qualifications, such as startig salary, employment and career paths as well as recognition of the Malaysian Skills Certificate (SKM) for more positions in the public sector.

Multiple delivery channels such as television, radio, magazines and celebrities will be used to convey he information to target groups. Councellors in scholls will be given responsibility to lead in a long time to help students, from continuing to form four students entering tertiary education. This measure is to ensure that more students continue to tertiary education. To enhance the effectiveness of coaching, counseling groups consisting of school counselors will be formed in each district.

Group counseling will be responsible for establishing close relationships with technical and vocational institutions and employers, as well as improve coordination among stakeholders through the exchange of information. This group will be responsible for providing guidance to vocational and skills in technical schools will be rebranded to provide more opportunities for the technically inclined students and raise awareness of TVET.

To provide greater focus on voctional areas concerned with the hands-on training and provide more appropriate courses, a total of 69 out or 88 technical schools will be converted into vocational schools and six vocational schools will be built by 2015. The government will encourage the government-linked companies and industry attachment programs provide jobs for school leavers technical and vocational institutions.

Increase in number of teaching excellence will be implemented through the expansion of part-time teaching program. This move will attract those who are interested in becoming teachers as well as continued work in the industry. Trainers who have current knowledge about the technology and industrial development will provide the most relevant taining and increase the employability of trainees. Collaboration between technical and vocatioal institutions and industry in the exchnage of personnel will be strenghtened to enable teachers to undergo vocational placement programs in the industry to gain exposure and knowledge of the latest technology.

At the same time, vocational tainers from the industry placed in technical and vocational institutions to strenghten their pedagogical skills. To strenghten the delivery of training and improve recruitment of teaching staff, the capacity of Centr for Instructor and

Advanced Skill Trainng will be enhanced by using a methodology and a new training approach. A training center for teachers will be developed to increase the traing capacity of 800 each year. In addition, the Skills Development Department will coordinate instructor training programs in public skills training institution to another.

2.0 LITERATURE REVIEW

Cultural dimension of learning is new in this globalization era. This is because, there is a culture where the learning process has begun and the technology associated with multimedia or multi-cultural teaching. Therefore, it is a hope for a learning culture must be viewed holistically in order to develop more appropriate method. The definition of culture here refers to the cross culture theory where cultural dimensions have been implemented in studying human behavior. The culture of learning has been changing from time to time in line with global technological developments. This culture begins with learning using the textbook. Then, it turned to the computer aided learning and when the technology grows, the use of internet in teaching and learning are more widespread.

Internet can be applied in education through activities either in their daily work or that involves teaching and learning process. There are signs of construction the new technology to increase learning performance. Internet revolution is not only to search for global information but even build and strengthen the ties between human beings to communicate. Electronic mail (e-mail) is one of the internet services that are widely used. In addition, listservs, Usenet and Internet Chat is a service that allows people to communicate with anyone using a computer.Therefore, teachers and students can join discussion groups to ask questions, discuss questions and share experiences and knowledge online.

There are a lot of interestings and differents for teachers and students in the internet. Information was available on the website in the form of database, documents, government information, online bibliographies, publications and computer software. Most of the information provided is updated and available for free and quickly accessible by anyone. Teachers and students can publish materials on the internet. The process of publication through the internet is faster and cheaper than the traditional channels. The work of teachers and students can be sent to the internet so the world can read them or make an assessment of a lesson developed.

The internet has enabled the service and training programmes delivered via online and remotely accessible. E-learning or online learning is learning through the implementation of technology support services such as telephone, audio, video, satellite transmission or computer. However, m-learning or mobile learning has been used to support e-learning. In recent years, the quick growth of mobile technologies is promising a new revolution that might be comparable with the Web. In brief, one of the major advantages for m-learning is where learning previously occurred in front of a computer terminal, in the classroom, laboratory or at home, it is now enabled to occur in the field, or at any location where the mobile device is fully functional (Sharma & Kitchens 2004). Details about the operation of m-learning and assessment tasks using any device connected to any network. At present, mobile learning is defined as the technology in learning. This is different from e-learning, where the users can use the technology due to its mobility and not to constraint to the places and areas to get the learning information.

According to Quinn (2002), m-learning is a learning that carried out through mobile devices analyzed as Personal Digital Assistant (PDA), mobile phones and palms. Keegan (2005) state that many researchers provide a complex definition of m-learning. For him, m-learning is the provision of education and training using the PDA, Palmtops, mobile computers, smart phones and mobile phones. As a conclusion, m-learning is learning and training which is carried out using mobile technologies devices such as laptops, PDAs, iPad, Play Station Portable (PSP) and mobile phones that allows learning occurs everywhere and at anytime.

M-learning also gives the students a head start in the IT revolution, equipping them with skills not only to do well in their studies but also to excel in their future careers. It allows students to use their own laptop computer for their studies on campus, thereby making student learning mobile.

In Malaysia, the method of m-learning is not impossible to implement because most students nowadays have their own portable devices like mobile phone, ipod, PSP and so on. Moreover, the provisions of broadband facilities provided by the telecommunications companies have been widespread in Malaysia. Recently, an article in the Utusan Malaysia (2011) states that there are 430 broadband centers will be set up in rural areas and remote areas across the country within two years. These facilities provided specifically for students and youths. Therefore, there will not be any problem to access the internet and is supported on m-learning.

Tools for M-Learning

There are varieties of mobile devices that support m-learning. Each of the tools has different capabilities and functions and the important is the ability of the equipment to support wirelesss applications. The following are the types of mobile devices that support m-learning:

- PDA (Personal Data Assistants) functions as a personal digital assistant which is very small sized and capable of playing variety multimedia files. PDA uses the Palm operating system and Microsoft Pocket PC.
- Small notebooks and light. Easy to carry anywhere and well capable of functioning as desktop computer. Most support wireless communication.
- Cellular phone allows users to communicate with one another at anywhere and at anytime. Users can also send and receive SMS and MMS to other users. There are also cellular phones that can access the internet via WAP or GPRS technology.
- Smart phone is a combination of cellular phone and PDA. This phone is using symbian software, windows mobile and other mobile software. It also equipped with the internet access and the ability to support multimedia applications.
- 3g phone is the 3rd generation of mobile phone that has the ability to transfer four times better than the ordinary cellular phones. It can transmit information up to 2 megabits per second in addition to support full video and multimedia.

The Advantages of M-Learning

M-learning have been proven that it can be very useful to support learning in other countries and now it has first introduced in Malaysia where there are several higher education institutions have to integrate this technology in their teaching curriculum. There are some advantages in the use of m-learning such as :

- 1. Learning process can occur anywhere at anytime and does not limited to the classroom.
- 2. System of m-learning is very interesting because students can create an interactive training using a mobile phone that has an internet access anytime an anywhere during their free time.
- 3. Students can easily download notes by using the internet service provided by a mobile phoe subsciprion. Therefore, the downloading process can be anywhere at anytime.
- 4. Teacher can make quizes for students at any time by simply inserting the question and determine the time taken for the quiz.
- 5. A test that held through mobile devices in education founds that the evaluation done by the test via m-learning is more effective and efficient.
- 6. The multimedia elements that can integrate audia and video is able to attreact student's interest in the use of m-learning.

The findings of the Attewell's (2005) study in formulating the project MLearn 2001 suggest that the use of m-learning can have a positive impact on several areas:

- 1. M-learning helps students to improve the literacy and numeric skills to identify their true capability.
- 2. M-learning can be used to encourage both independent learning and experience sharing of learning experiences.
- 3. M-learning can help the students identify things that need help and support.
- 4. M-learning can help to use the information and communication technology and can help to reduce the gap between mobile phone literacy with information technology literacy.
- 5. M-learning helps the students to refuse some of the formalities in the learning experience.
- 6. M-learning helps the students to maintain focus on learning for a longer time period.
- 7. M-learning helps to increasing the self-esteem.
- 8. M-learning helps in increasing the self-confidence.

These positive effects if can be applied in the Malaysian Technical and Vocational Education learning environment will necessarily improve the student's performance in all aspects to be achieved.

The Disadvantages of M-Learning

In a research paper conducted by Singh and Zaitun (2006), several disadvantages have been identified within integrating mobile devices with the scenario of education in Malaysia, including:

- 1. The storage capacity for palm talk and mobile phone are very limited.
- 2. Broadband speeds may be reduced when the number of users increases.
- 3. PDA and mobile phones are not durable compared to personal computer.
- 4. The batteries should be charged often and if not done correctly, the data may be lost.
- 5. Limitation of small screen size.

Limited exposure to mobile technology is also seen to be one of theproblems in the development of m-learning methods. Early exposure, especially to students is important for students' to understand and then adapt the method of m-learning.

The role of teachers is also seen to be very important in the development of mlearning. Teachers should be introduced to the m-learning prior to this method before introduced to the students. Poor control of m-learning could be the cause of the ineffectiveness of the whole m-learning.

Relationship Between e-learning and m-learning

According to Brown (2003), m-learning is a subset of e-learning. E-learning is a macro concept that involves online learning environment and m-learning. The diagram below indicates clearly the relationship between e-learning and m-learning. Through the diagram can be seen that m-learning is a subset of e-learning while e-learning is a subset of distance learning. While distance learning is a subset of a flexible learning.



Figure 1: Relationship between e-learning with m-learning (Brown, T. H. 2003).

A Model for Analysing Mobile Learning

This model is design to describe an application of cultural-hostorical activity theory to analyse the activity system of mobile learning. It is describe the dialectrical relationship between technology and learning. In the tradition of Activity Theory, it is analyse that learning as a cultural-historical activity system, mediated by tools that both constrain and support the learners in their goals of transforming their knowledge and skills.

In analysing the activity of mobile learning it has helped to separate two layers of tool-mediated activity. The semiotic layer describes learning as a semiotic system in which the learner's object-oriented actions such as actions to promote an objective are mediated by cultural tools and signs.

The technological layer represents learning as an engagement with technology, in which tools such as computers and mobile phones function as interactive agents in the process of coming to know, creating a human-technology system to communicate, to mediate agreements between learners as with spreadsheets, tables and concept maps and to aid recall and reflection as with weblogs and online discussion lists.



Figure 2: A Model for Analysing Mobile Learning (2005). Source: Mike Sharples, Josie Taylor, Giasemi Vavoula, Towards a Theory of Mobile Learning

Control

The control of learning may rest primarily with one person, usually the teacher or it may be distributed among the learners. Control may also pass between learners and technology for example in a dialogue for computer-based instruction. The technological benefit derives from the way in which learning is delivered, whether the learners can access materials when convenient and whether they can control the pace and style of interaction. These are issues of human-computer interaction design.

However, technology use occurs within a social system of other people and technologies. Social rules and conventions govern what is acceptable for example how to use e-mail, who is allowed to e-mail whom and what kinds of document format should be used. A person's attitudes to technology can be influenced by what others around them think about it for example whether they are resentful at having to use the technology or keen and eager to try it out. And individuals and groups can also express informal rules about the way they like to work and learn.

Communication

The dialectrical relationship between the technological and semiotic layers is perhaps the easiest to see in relation to Communication. If a technological system enables certain forms of communication such as e-mail or texting, learners begin to adapt their communication and learning activities accordingly for example, children are increasingly 'going online' at home, creating networks of interaction through phone conversation, texting,e-mail and instant messaging that merge leisure and homework activities into a seamless flow of conservation. As they become familiar with the technology they invent new ways of interacting such as 'smilies', text message short forms and the language of instant messaging that create new

rules and exclusive communities. This appropriation of technology not only leads to new ways of learning and working, it also sets up a tension with existing technologies and practices. For example, children can subvert the carefully managed interactions of a school classroom by sending text messages hidden from the teacher. On a broader scale, technology companies see markets for new mobile technology to support interactions such as file sharing and instant messaging. Thus, there is a continual co-evolution of technology and human communication with each new development creating pressures that drive the next innovation.

Context

The context of learning is an important construct, but the term has many connotations for different theorists. From a technological perspective there has been debate about whether context can be isolated and modelled in a computational system or whether it is an emergent and integral property of interaction. Work for the MOBIlearn project has developed an interactional model of context for mobile learning (Lonsdale, Baber & Sharples, 2004). Context also embraces the multiple communities of actors, both people and interactive technology who interact around a shared objective.

Model of Instructional System Design

Tsai, Young and Liang (2005) has developed a model of "Instructional Systems Design (ISD) model based on the ADDIE model of instructional design and ASSURE model.



Figure 3 : Model of Instructional System Design (2005)

Source : I.H. Tsai, S.S.C. Young & C. H. Liang. Exploring the course development model for the mobile learning context. A preliminary study. Papers Fifth IEEE International Conference on Advanced Learning Technologies (ICALT'05). Kaohsiung, Taiwan.

There are six steps in the ISD model which are:

- Analysis of students' needs and mobile situation, including analyzing the needs of mobile to integrate mobile technology in learning, students' readiness to use technology to analyze, collect and analyze various sources of learning outside the classroom learning environment.
- (ii) Integration of mobile technology-based teaching, including the suitability of mobile technology such as weight, screen size resolution and other specifications as well as analyze and develop a wireless environment for use outside the classroom.
- (iii) The design of m-learning strategies includes planning the provision of learning materials for m-learning for students to focus on the learning environment that is open.
- (iv) Design the development of the content og m-learning materials, including the preparation of learning plans, providing objectives, the selection of appropriate instructional media, developing multimedia learning materials and develop a timetable and cost of labor.
- (v) Implement the learning activities, including organizing the entire m-learning activities in accordance with the six teaching steps by Gagne.

Assess the impact of m-learning include using various forms of assessment to evaluate the effect of including tests of qualitative reports.

Constructivism Theory in M-Learning

In this study, researcher chose a constructivist approach in the m-learning approach was developed because this theory emphasizes the active involvement of students. This theory emphasizes the behaviour of students (hands-on) and emphasizes the mental activity (minds-on) students. According to the views of constructivism, students have their own ideas about the occurrence of the phenomenon before entering the classroom. Students construct their own reality or reality-based perception to interpret their experiences.

M-learning based on constructist theory emphasizes the development of a software that has a different perspective (multiple perspectives), such as the use of collaboration and communication tools and access to data to allow students to learn from different perspectives. Student-centered learning is students' ability to apply completely free to choose topics to study, generating their own questions and plan their own learning. According to Baharuddin et al. (2002), constructivist theory of strategies to promote the discovery of the m-learning is developed. Students should be given activities that allow students to meet their own educational pronciples.

Teachers are not supposed to help by providing principles to assist the process of teaching students to be more effective. In this context, students are helped to make a generalization and transfer learning to other situations by using the same concept.

Possibilities Using Mobile Learning

Mobile learning implies several possibilities for learning. Learners with a mobile device can go to a field to interact with other people, and participate in physical environments for gaining concrete knowledge, instead of sitting in front of a computer screen. When mobile learning first arrived on the scene about 10 years ago, it was thought to be like e-learning except on a smaller screen. That is, educational material was packaged as courses, and tests were given on mobile phones. 10 years later, there are many new developments in mobile learning, some of which have the potential of being highly disruptive of how teaching and learning has traditionally been carried out. Technology is one of the main drivers of the existing mixed mode and flexible learning environment in schools and universities today. There is a need to develop instructional strategies that marry most effectively traditional approaches to teaching and learning with more contemporary concepts of e-learning, flexible and online learning and virtual class or virtual campuses.

Instructional strategies determine the approach a teacher may take to achieve learning objectives. Strategies can be classed as direct, indirect, interactive, experiential or independent. Decision making regarding instructional strategies requires teachers to focus on curriculum, the prior experiences and knowledge of students, student interests, student learning styles and the developmental levels of the student. Such decision making relies on ongoing student assessment that is linked to learning objectives and processes. M-learning has been used to help those students who are outside formal education, who have abandoned their studies, teenagers no longer motivated by traditional curricula, and to prevent the risk of leaving school. By using mobile learning, students could send text messages, keep in touch with friends, play computer games and learn by doing which can make the learning process more enjoyable with the help of the appropriate instructional strategies. The portability and versatility of mobile devices has significant potential to promote an instructional strategies shift from traditional teacher-centered to student-centered and participatory learning environments. Students can participate in learning scenarios that utilizes the mobility, portability and context-sensitivity of mobile devices. They can act as active self-directed students, rather than passive students following one single path of learning.

The relationship between the mobile and the student depends on the medium and not on the environment. So the user is no more constrained to have a PC to optimize his/her time for learning because the mobile is "comfortable" and easy to access to learning. Interaction is vital in learning and the place does not interfere with learning. M-learning can substitute the PC/laptop which is not always within reach, the mobile can be used for the acquisition of knowledge, may help to speak in a foreign language, may help students with difficulties in a more appealing and motivating way. This case clearly shows that, by using mobile learning, students in TVE will be through the teaching and learning process more effectively.

3.0 METHODOLOGY

Proposed Data Collections/Instruments

This is a qualitative research. Data collection methods to be used is an unstructered interview conducted in-depth, writing in the note field, document analysis and observations. Interviews were conducted by face-to-face, either individually or grouping. The participants for this study were students taking the technical and vocational education and training, the teachers, the administrator, the company of m-learning and e-learning expertise, the lecturers and the director of department of technical and vocational education and training.

Data Analysis

Data will be analyzed based on the concept of qualitative data collected will be compiled on a systematic basis, such as arraging data in tubular form. The detain this study will be made on the reccomendations of Merriam (1998). The analysis made in two stages, namely analysis, during and after data collection. After collecting data, Nvivo 8 software will be use to organise data..

4.0 SUGGESTIONS

Education based m-learning course is suitable for in Malaysia. Paradigm, we respect this new technology should be changed so that it can be realized. Convenience of modern educational methods and tools should be tested over the collective to ensure students can experience the excitement of learning where without being limited extent, place and time. Limited exposure to mobile technology must be terminated by holding a special class in respect of this technology. Therefore, the opportunity for students to understand the power of technology can be improved.

Extensive research may be conducted, particularly in overcoming the identified problems and improve the opportunities available to strengthen the m-learning in Malaysia. Environmental education in Malaysia may be different from other countries, so the connection can be implemented to realize the environmental of m-learning. Extensive research in this area have been identified to develop the education sector as a whole, especially in technical and vocational education.

5.0 CONCLUSION

M-learning has come to play an important role in learning, especially for technical and vocational educatioan. The existence of mobile and wireless technology has made it reality. Student is free to learn and acquire information to make m-learning very well-liked. Through the technology and the ability to have mobile devices, m-learning is not something that is difficult to be implemented in Malaysia. Commitment of all stakeholders including the government, service providers, instructional designers, teachers and students is needed.

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