Usage of Mobile Learning among Mechanical Engineering Students at Premier Polytechnics Malaysia

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Abstract

The usage of mobile learning also known as m-learning provides an opportunity for the new generation of people with better communication and activities without taking into account the place and time. The purpose of this research is to explore the most favourite mobile device used by mechanical engineering students for learning purpose. Besides, to examine the phone features that is preferred or frequently used among these students in their m-learning. The students are from premier polytechnics (PUO, PSAS, and PIS). This study is conducted via collection of data using questionnaire with quantitative research method. Results of this survey states the commonly or most liked mobile device used among the students with the features preferred for m-learning via mean descriptive analysis. IBM Statistical Package for Social Sciences version 20 for Windows (SPSS) was used to analyse the data. Widespread access to mobile devices and the opportunity to learn regardless of time and place make the mobile learning an important tool for lifelong learning.

Keywords: M-Learning, Premier Polytechnic Students, Mechanical Engineering Students, Mobile Device

Introduction

One of Malaysia's prominent online news portals published an article reporting that almost 40 per cent of Malaysia's population owns at least two mobile phones with a penetration rate of some 137.7 per cent (NST- Business Times, 2013). Today, the evaluation of handheld portable devices and wireless technology are reshaping user daily lives in different ways (El-Hussein et al., 2010). There are some evidences say or approved the effectiveness of m-learning in learning activity or process where it can improve students' interest, focus their learning and student performances (Isham et al., 2011).

Generally, mobile phones allow student-centered learning in which students are able to modify the access and transfer of information to strengthen the knowledge and skills of students to meet their educational goals (Sharples et al., 2007). In addition, m-learning means decentralization of information handling because m-learner can work with his or her mobile technologies anywhere and anytime by Tella (2003). Even Vuojärvi, Isomäki, and Hynes (2010) explored on how students in laptop-mandated programs integrated the laptop into their personal and academic lives. They found that students who had a higher proficiency with

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information technology and especially those who had prior experience with the software used in their classes were more easily adapted to laptop as a learning tool. Arguably, it could be thought that m-learning is an approach to electronic learning (E-learning) that simply utilizes mobile devices, yet it can also be viewed as a quite different learning experience by Traxler (2005). Indeed, m-learning can only be delivered with an awareness of the special limitations and benefits of mobile devices, so one cannot simply apply known design requirements from E-learning into the m-learning context. During trials of tablets at Stanford and at the University of Notre Dame, many students found adapting to the device difficult and, within a few weeks, switched back to using their laptops (Fischman et al., 2011).

Traditional teaching approach is known to be lecture centered and teaching aids are often used. For instance, supporting materials such as reference books, notes and handouts are used during teaching and learning process. Therefore, such teaching methods tends to be boring and results in a poor lesson delivery. Nevertheless, students are lazy to refer to the reference materials, leading to an incomplete learning process (Marwan et al., 2013). Learners have their own learning preferences that explicitly require a mobile device which is suitable to their learning culture or learning behavior. Hereby, this is where the learning theories play vital importance amongst learners. There is also an emerging "app gap" existing among lower income children who are more than 50 percentage less knowledge about mobile devices where else compared to the higher income group of the same age by Rideout et al., 2011. Even Murray, 2005 mentioned that traditional methods are currently being replaced by newer alternatives. Availability of advanced mobile technologies, such as high bandwidth infrastructure, wireless technologies, and handheld devices, has started to extend e-learning towards m-learning by Sharples (2000).

Besides, students and lecturers often encounter difficulties in conducting the classes as there are limited of lecture hall or inadequate learning facilities. Furthermore, most of the learning process is usually carried out in the class and it is difficult to conduct a discussion or evaluation outside the class time (Marwan et al., 2013). In addition, students might need training in the basic functions and applications of m-learning technologies (Cheon et al., 2012). This can also be said that there is lack of technical skills among students. For these reasons, the mobile technology-based education has to be designed to dynamic, easily scalable and applied at all times and at any places. The learning system should be designed whereby the information provided can be chosen by the students that caters their needs. The system must incorporate information according to students' needs (Chen and Kinshuk, 2005). The use of ICT is only one of the new and enhancements to make learning and teaching more appealing (Kenning, 2007; Mohd Arif, 2004; Tinio, 2002).

The aim of this research is to explore the most favourite mobile device used among mechanical engineering students in premier polytechnics. In addition, to examine the phone features preferred or frequently used in m-learning among the students. As for the scope of this study is conducted at premier polytechnics that are Polytechnic Ungku Omar (PUO) at Ipoh, Polytechnic

Sultan Salahuddin Abdul Aziz Shah (PSA) at Shah Alam, and Polytechnic Ibrahim Sultan (PIS) at Pasir Gudang. This research mainly focuses on the usage of mobile learning in teaching and learning process relating to learning theories. These polytechnics are selected as known because they are premier and ought to become universities soon. Therefore, current usage of m-learning is to be investigated in these polytechnics.

Learning Background

Learning takes place everywhere and not only restricted in classrooms. The broadest definition of learning is a process of any living organism leads to permanent capacity change (Illeris, 2007). Besides, learning is defined as the behavioral, cognitive and social change resulting from a particular situation. This process is made optimal by taking external conditions into consideration and the result of learning is achieved through practice (Tóth, 2012). As Hill (2002) has observed that the various learning theories mentioned have two significant values. The first thing that a learning theory provides is the vocabulary and a conceptual framework used to interpret the examples of learning that we observe. The theories do not provide solutions, but directs the attention to those variables that are crucial in finding solutions. There are five orientations to learning which are behaviourist, humanist, cognitive, social cognitive, and constructivist. The table below shows a summary of it.

Table 2.1: Five orientations to learning

Aspect	Behaviourist	Humanist	Cognitivist	Social Cognitive	Constructivist
Learning theorists	Guthrie, Hull, Pavlov, Skinner, Thorndike, Tolman, Watson	Maslow, Rogers	Ausubel, Bruner, Gagne, Koffka, Kohler, Lewin, Piaget	Bandura, Rotter	Candy, Dewey, Lave, Piaget, Rogoff, von Glaserfeld, Vygoisky.
View of the learning process	Change in behaviour.	A personal act to fulfill development.	Information processing (including insight, memory, perception, metacognition).	Interaction with and observation of others in a social context.	Construction of meaning from experience.
Locus of learning	Stimuli in external environment.	Affective and developmental needs.	Internal cognitive structure.	Interaction of person, behaviour, environment.	Individual and social construction of knowledge.
Purpose of learning	To produce behavioural	To become self-	To develop capacity and	To learn new roles and	To construct knowledge.

	change in desired direction.	actualized, mature, autonomous.	skills to learn better.	behaviours.	
Instructor's role	Arrange environment to elicit desired response.	Facilitate development of whole person.	Structure content of learning activity.	Model and guide new roles and behaviours.	Facilitate and negotiate meaning making with learner.
Manifestation in adult learning	Behavioural objectives, accountability, performance improvement, skill development, HRD and training.	Andragogy, self-directed learning, cognitive development, transformation learning.	Learning how to learn, social role acquisition, intelligence, learning, and memory as related to age.	Socialization, self-directed learning, locus of control, mentoring.	Experiential learning, transformational learning, reflective practice, communities of practice, situated learning.

Current approaches to teaching and learning are still the same with heavy emphasis on rote learning and memorization techniques closely related to the exam-oriented educational system employed in the country (Author, 2014). The rapid growth of smart phones lately are notably becoming more accessible, affordable and widely used where a new learning paradigm is drawn bringing in new learning opportunities to all. Mobile device usage for educational purposes is becoming a common expectation of learners (Lan and Huang, 2012). The learning theories of behaviourist, cognitivist, and social cognitive merge with current generation based on researchers. Learners require change of behaviour in learning with processing information according to cognitive structure and interaction with others in social context.

Mobile Learning Background
Mobile device is becoming popular among teenagers who can be fulfilled in the ubiquitous idea of learning (Habboush et al., 2011). Almost every student in higher education can be seen to have a mobile phone. Most Malaysians consider mobile phones a necessity. Malaysians were also found to be among the most prolific users of their smart phones, spending an average of 6.4 hours a week accessing the internet through their devices (NST-Business Times, 2013). Normally, we call e-learning with mobile device as mobile learning or m-learning in short form. In the 90s, a new form of learning was revealed, namely, the mobile learning (M-Learning) by Wains and Mahmood, 2008. E-learning is generally defined as learning through electronic devices such as desktop / laptop computers, smart phones, CD/DVD players, etc.), which first appeared in the 80's as a competitor to traditional face-to-face as stated by Abuhamdeh, 2010.

Brown (2003) contends that m-learning is a subset of E-learning. The diagram below shows clearly the relationship between E-learning and m-learning.
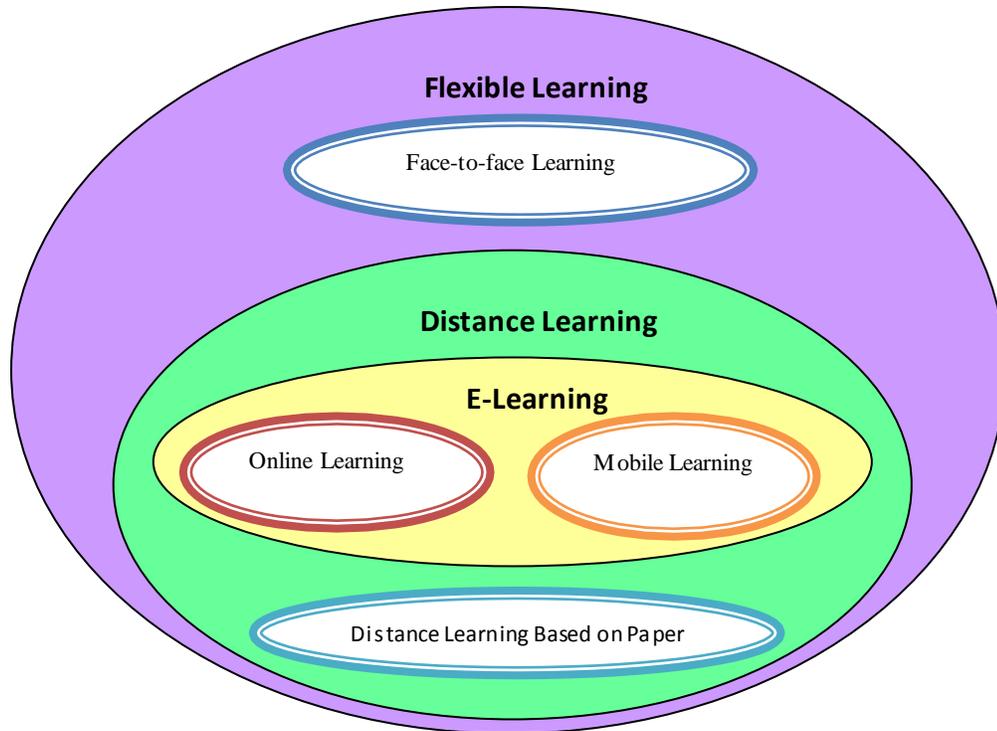
Figure 2.1: Relationship between e-learning with m-learning (Brown, T. H. 2003).

Flexible Learning

Van den Brande (1993) describes flexible learning as "enabling learners to learn when they want (frequency, timing, duration), how they want (modes of learning), and what they want (learners can define what constitutes learning to them)". According to Collis & Moonen, (2001) flexible learning is a movement away from a situation in which key decisions about learning dimensions are made in advance by the instructor or institution, towards a situation where the learner has a range of options from which to choose with respect to these key dimensions which is more to learner centered.

In other words, flexible learning leads to a learning situation where students set their own objectives and plan, regulate, and evaluate the learning process themselves (Narciss et al., 2007). Consequently, work and family commitments are creating competing pressures on students, who are requiring more flexibility in their learning, in ways that fit in with their work and family commitments (McInnis and Hartley, 2002).

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Face-to-face Learning

According to Redmond P. (2011), academics who have commonly taught in a face-to-face environment are under pressure to embed ICTs into their face-to-face teaching and to work in blended and online modes. A major challenge, identified by Yang and Cornelious (2005), when instructors move from a largely teacher directed face-to-face environment to an online environment, is to redesign learning towards a constructivist approach. Furthermore, many experienced or expert face-to-face teachers find themselves as novices or beginners when first teaching online and in some cases it could result in a resistance towards online teaching (McQuiggan, 2007). This is because in the point of view from researcher, the traditional education process that is face-to-face learning that takes place in class room where the learners typically only get the learning materials prepared in advance by the teacher. As a result, the learning activities are limited in what teacher arranged and consequently it is rather difficult to adapt the learning materials to individual learner's learning requirements and demands.

As Coldeway (1995) discussed, this is a traditional face-to-face approach where the instructor and learners are in the same geographical location at the same time. However, today some people might consider using synchronous technology tools such as Wimba and Elluminate, or Skype to interact with others at the same time in the same virtual space. Adding on, he stated that this virtual space replicates many aspects of face-to-face spaces with all participants having access to the same resources, files and synchronous discussion at the same time. At the same time though, the electronic discussion had fewer of the interactional features such as questioning, recasting, confirmation checks, and paraphrasing that are often found in face-to-face interaction and which are viewed as important for language learning by Long and Porter (1985).

Distance Learning

One of the earlier forms of distance learning was done through correspondence courses started in Europe. This stayed the primary means of distance learning until the middle of this century when instructional radio and television became more popular (Imel, 1996). As technology has changed, so has the definition of distance learning. King et al., (2001) do not support the interchangeable use of the terms distance learning and distance education, because both terms do differ. This is because distance learning is referenced more as ability, whereas distance education is an activity within the ability of learning at a distance. Yet, both definitions are still limited by the differences in time and place according to Volery and Lord (2000). As new technologies become apparent, learning seemed to be the focus of all types of instruction, and the term distance learning once again was used to focus on its limitations associated with "distance", i.e. time and place (Guilar and Loring, 2008; Newby et al., 2000).

The term then evolved to describe other forms of learning, e.g. online learning, e-Learning, technology, mediated learning, online collaborative learning, virtual learning, web-based learning, etc. (Conrad, 2006). Advances in information technology (IT) are enabling little used educational delivery methods such as distance learning (DL) to gain new life. Even, Teaster and Blieszner (1999) say "the term distance learning has been applied to many instructional

methods: however, its primary distinction is that the teacher and the learner are separate in space and possibly time".

Distance Learning Based on Paper

As for Phipps and Merisotis's (1999) review that distance learning is "as good as traditional education". There are archives of papers, conference announcements, calls for papers, electronic journals, literature reviews, software, books, guides, library catalogs, resource databases and more-all accessible with a few keystrokes .

E-Learning

E-learning (EL) is a unifying term used to describe the fields of online learning, web-based training and technology delivered instructions by, Oye et al., (2010). EL, on the other hand applies computer technologies and Internet to assist teachers' teaching and learners' learning (Brodersen et al., 2005). EL has become an increasingly popular learning approach in higher educational institutions due to vast growth of internet technology. A mix of e-mail, learning management system, web-camera and other online tools are used in e-learning in order to facilitate learning without requiring the teacher and learners to be present at one location (Martin, 1994). Hence, this enables students to be more independent rather than merely depending on their teachers. E-learning is training delivered on a computer (including CD-ROM, Internet, or intranet) that is designed to support individual learning or organizational performance goals (Clark and Mayer, 2003).

Online Learning

This online learning is being promoted as the educational pedagogy of the future. Some experts have gone as far as to predict that the "residential based model," that is, students attending classes at prearranged times and locations will disappear in the near future (Blustain et al., 1999 and Drucker 1997). Online learning is described by most authors as access to learning experiences via the use of some technology (Benson, 2002; Carliner, 2004; Conrad, 2002). Online learning is also defined as education in which instruction and content are delivered primarily over the Internet (Watson and Kalmon, 2005).

Both Benson (2002) and Conrad (2002) identify online learning as a more recent version of distance learning which improves access to educational opportunities for learners described as both nontraditional and disenfranchised. Other authors discuss not only the accessibility of online learning but also its connectivity, flexibility and ability to promote varied interactions (Ally, 2004; Hiltz and Turoff, 2005). Online learning often referred to as e-learning is a sub-set of flexible teaching and learning that seeks to provide greater access to learning for all students. Thus, in the United States, for example, over 3.5 million college students took at least one online course in the fall term of 2006 (Allen and Seaman, 2007). The Malaysian youth of today are evolving increasingly to what is described as the e-generation or e-genres or n-genres (Wim Veen, 2002).

Mobile Learning

By definition, mobile learning (m-learning) is learning by means of wireless technological devices that can be pocketed and utilized wherever the learner's device is able to receive unbroken transmission signals (Attewell and Savill-Smith, 2005). Others define and conceptualize mobile learning by placing a strong emphasis on the mobility of learners and the mobility of learning, and the experiences of learners as they learn by means of mobile devices. M-learning extends the learning from indoors to outdoors by giving learners opportunities to understand the learning materials through touch, observation and feel of the learning objects in real environment (Kuo et al., 2007).

M-learning values and defends in its own unique way the introduction of what is radically new in the technological, social and cultural spheres of human life and activity. One of the main advantages of mobile learning is that it allows this generation of learners to enjoy certain amount of freedom and independence, Uden (2007). As Hirsh, (2005) mentioned that "as a start, consider the use of student-based technology to be a transformer you can put in place quickly at minimal cost". Furthermore, Williams (2006) mentioned that because of the affordability of mobile technologies such as handheld computers and mobile phones, together with the various functions that this device offers for teaching and learning, he believed that this device is a sensible choice for educational investment.

According to El-Hussein et al., (2010), define mobile learning as learning environmental based on mobility of technology, mobility of learners and mobility of learning. The following figure illustrates three concepts involved in m-learning.

Figure 2.2: The three concepts of M-Learning.

Mobility of Technology

Advanced mobile devices are furnished with Wireless Application Protocol (WAP) and Wireless Fidelity (Wi-Fi) capacities so that a user can connect to the Internet by means of his or her PDA (Trinder, 2005). He further explains the functionalities of the most popular and expensive mobile phone technologies. These include an organizer, video camera, telephone, GPS and film player. They also include games, e-book, e-mail facility Internet access and musical MP3s. But the most popular functions in all mobile phone remain the short messaging service (SMS) and

the multimedia messaging service (MMS) frequently used functions in the delivery of higher education instructions. Indeed, Motiwalla (2007) states that although it is inevitable that m-learning will soon become an essential extension of e-learning, this transition will not happen overnight. Thus, such applications aforementioned are generally utilized by mobile device users.

Mobility of Learning

Walker (2007) points out that the advantages of mobile learning are not dependent solely upon the ability to use a portable and wireless communication device successfully. He argues that the kind of learning experienced by mobile owners is unique because it is received and processed within the context in which the learner is situated. As for Sharples et. al., (2007) a "convergence is occurring between the new personal and mobile technologies and the new conceptions of learning as a personally-managed lifelong activity". Adding on, Laouris and Eteokleous (2005) say as our engagement with technology changes with time, mobile learning becomes a function not only of time, but also of the momentarily available and dynamically changing technology. Henceforth, mobile learning occurs anywhere and at anytime that is convenient for the users.

Mobility of Learner

The overall advantages provided by the mobile learning are more flexible, accessible and personalized learning activities keep the learner engaged in the ongoing learning activities and enhance their productivity and effectiveness by Ting (2005). Furthermore, Guralnich (2008) suggests that the designer would be better served if he or she considered the entire context in which learners will use particular m-learning program. As mentioned, mobility of learner occurs at their own space to study. From the survey done by researcher it is found that students prefer to be engaged with their mobile device after class or work. The percentage shows the highest that is 21.7% and following up is during night that is around 8%. Other hours of the day consist of lower percentage of mobile device usage among the students.

Adaptation of Mobile Learning among Students

In this 21st century, there is a big motivation seen among students and lecturers to use mobile devices for educational purposes. It is a world of technology where traditional teaching approach that is chalk and talk is no more a creative method of education lately. The use of technology is viewed as a potentially powerful enabling tool, specifically for educational change and reform (Tinio, 2003). Therefore, m-learning 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. Alzaza (2012) states that those who have adequate knowledge and awareness to use a certain technology in the educational environment were also demonstrating their readiness for m-learning implementation at their institution. On the other hand, it was found by Mahamad et al. (2010) that lacks of awareness on technological classroom tools may also deter users from being ready for educational mobile usage.

As stated, to determine the level of technology acceptance as well as to investigate the readiness to embrace mobile phone technologies in education is from all components (awareness and motivation, training and courses, training design, and supports and facilities) to be high. The following table shows some of the differences between normal learning styles and M-Learning by Devinder and Zaitun (2006).

Table 2.2: Difference between Normal Learning and Mobile Learning

Bil	Normal Learning Style	Mobile Learning
1.	Individual assessment, group projects, group discussions and project presentations will be done through quizzes and tutorials.	The use of multimedia elements in conveying information and receive online feedback.
2.	Students will go to a class or lecture hall to attend the lecture.	The learning process can be done anywhere and at any time.
3.	Students will interact face to face and allow them to communicate effectively.	Able to organize meetings and schedules of all team members at the same time.
4.	Using chalk and talk method in delivering information.	Students can get the lecture notes quickly without copying it from the board.

Research Design
Research design that is used in this research is quantitative research method conducted via a questionnaire. This is because quantitative methods are also frequently characterized as assuming there is a single "truth" that exists, independent of human perception (Lincoln and Guba, 1985). In this study the questionnaire is divided into two parts where the first part consists of demographic data, while second part of the questionnaire is on the mobile device owned by polytechnic students in mechanical engineering department. The research focuses on premier polytechnic students whereby the population chosen is from mechanical engineering faculty. The research is done in three different locations which are in Perak, Selangor, and Johor according to the premier polytechnics in Malaysia. These polytechnics are chosen because of the programmes offered are similar whereby all these three polytechnics have mechanical engineering course. Sample is from three different polytechnics as mentioned which are premier and certain duration given to answer the questionnaires. Data obtained is based on Likert Scale. The data is analyzed using IBM Statistical Package for Social Sciences version 20 for Windows (SPSS).

Research Population and Sample
In this research as mentioned population of students are from premier polytechnics. These students are selected based on the merit qualification whereby they have at least five subjects obtained with grade C and the required passed subjects for the course applied. Hereby, stratified random sampling is being used for the research since the subgroup within the

population is determined specifically according to the engineering departments provided in each polytechnic. Stratified sampling is firstly done according to the polytechnic which has been stated previously. As in the table below the sample study is taken based on The Research Advisors (2006). The following table briefly describes the flow of the stratified random sampling used in this research for engineering department.

Table 3.1: Stratified sampling on premier polytechnics.

Polytechnic	Department	Population	Sample
Polytechnic Ungku Omar (PUO)	Mechanical	1200	291
Polytechnic Sultan Salahuddin Abdul Aziz Shah (PSA)	Mechanical	400	196
Polytechnic Ibrahim Sultan (PIS)	Mechanical	1000	278
	Total	2600	765

Results and Discussion

Most commonly used mobile device among mechanical engineering students at premier polytechnics

From the research findings based on demographic data 82.2 percentages of students are male dominant in mechanical engineering field in these premier polytechnics and majority of are taking DKM course which consist of 54.6 percentage. As for the most commonly used mobile devise among the students are smart phone and laptop according to the findings as in Figure 6.1. Students were more favourable in using both smart phone and laptop as the mobile device for learning purpose. The next highest percentages of commonly used mobile device among these students were smart phones and tablet was the least percentage of usage among the mobile devices.
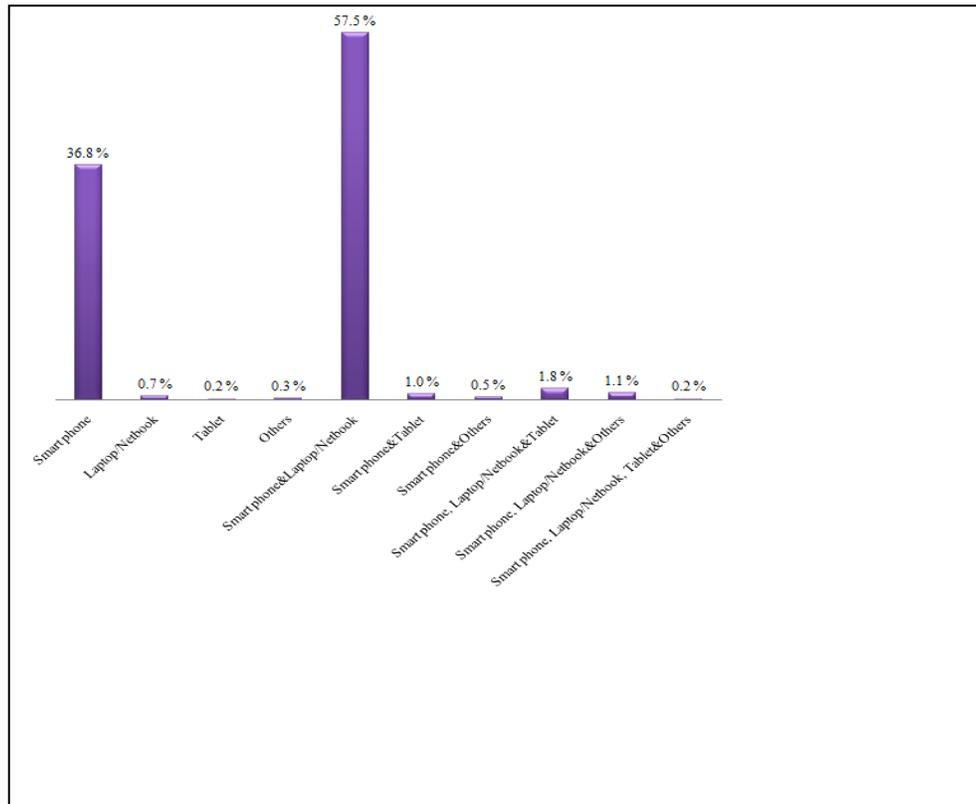
Figure 5.1: Percentage of Most Favourite Device among Mechanical Engineering Students at Premier Polytechnics Malaysia.

Most Malaysians consider mobile phones a necessity and this attitude is reflected by learners in the country's higher education institutions where there is a minor difference between laptops and smart phones. This is seen clearly as in Figure 5.1 where both smart phones and laptops had the highest percentage of usage among the students. Yet, the usage of only smart phones recorded second hoghes percentage of mobile device used in m-learning too. This states that smart phones are cheaper than personal computers and for this reason they are quite popular. It has become almost a necessity to own one nowadays and it is clearly stated in the findings too. Currently traditional methods are being replaced by newer alternatives (Murray, 2005). As known to make learning and teaching more appealing, the use of ICT is only one of the new and enhancements (Kenning, 2007; Mohd Arif, 2004; Tinio, 2002). Given that today's students are in the Net Generation are not afraid of technology use. Therefore, teachers should make full use of available technologies and particularly students' own mobile devices, to make learning more meaningful and interesting.

As for the usage of tablets in m-learning is being least preferred among the students as shown in Figure 5.1. There is a vast difference of tablet with laptop and smart phone. Even Fischman et

al., 2011 noted that, during trials of tablets at Stanford and at the University of Notre Dame, many students found adapting to the device difficult and, within a few weeks, switched back to using their laptops. This is perhaps because both tablet and laptop technologies have many similarities such as provide Internet connectivity, as well as access email, communicate using social networking applications, allow students to type lecture notes electronically or access electronic lecture notes that have been provided and to utilize electronic versions of textbooks, which reduces the cost of the books and the effort required to carry them. It is not denied that tablets do represent a powerful new computing tool however; they may not be perfect substitutes for laptop computers. Although many software applications have been created for tablet, the variety and functionality of the applications often lags behind applications written for personal computers also known as laptops.

Most preferred features used in m-learning among mechanical engineering students at premier polytechnics
Majority of the research participants tend to use the mobile device for the purpose of social application with a percentage of 22.9 percentages and followed by a difference of only 0.4 percentages, to the second highest percentage of applications used are call, social, email, surf and organizer which is 22.5 percentages. It is has been stated clearly that the items of sending e-mails, receiving e-mails, and installing drivers or software were having high mean score. According to Vuojärvi et al. (2010), students who had a higher proficiency with information technology and especially those who had prior experience with the software used in their classes been more easily adapted to laptop as a learning tool. Even Sharples, 2000 mentioned that availability of advanced mobile technologies, such as high bandwidth infrastructure, wireless technologies, and handheld devices, has started to extend E-learning towards m-learning by Sharples (2000). Nevertheless, it is agreed that the adaptation of m-learning among students who have adequate knowledge and awareness to use a certain technology in the educational environment were demonstrating their readiness for m-learning implementation at their institution by Alzaza (2012).

Conclusion
M-learning 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 via mobile devices. In Malaysia, the method of m-learning is not impossible to be implemented because most students nowadays have their own portable devices like smart phone, laptop, IPod, PSP and so on. Moreover, the provisions of broadband facilities provided by the telecommunications companies have been widespread in Malaysia. Thus, m-learning has begun to play an important role in learning. The existence of wireless mobile technology has made it a reality. Flexibility for students to learn and acquire information to make the m-learning is very popular. Hence, from this study it is shown that students have the awareness to mobile technologies in learning process. The students were keen to use all sources of m-learning approaches through laptops, smart phones and tablets so that access to information would be

anytime and anywhere. Yet, m-learning will not replace traditional learning. It just provides another way of learning using new mobile technology.

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