



Mobile devices for learning in Malaysia: Then and now

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Since 2010, there has been a visible increase in the amount of research focused on mobile learning in higher education in Malaysia. To determine if this increase corresponds to an increase in the use of mobile devices to support student learning, data from two surveys conducted in 2008 and 2013 were compared to determine the changes in rates of ownership and use of mobile devices among students. In 2008, although all students owned feature phones very few had access to other mobile devices and rarely used them to support their learning. In 2013, the picture had changed significantly, with some 80 per cent of students owning smart phones and all had access to mobile devices of some sort. Additionally, students were using these devices to support their learning in a number of ways. The paper concludes with indications and implications for future research.

Keywords: Mobile learning, m-learning, mobile learning research, Malaysia

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). The same article also reported that based on trends revealed in a recent survey conducted by McCann Worldgroup, within two years almost 60 per cent of the Malaysian population will own a smartphone. Malaysians were also found to be among the most prolific users of their smartphones, spending an average of 6.4 hours a week accessing the internet through their devices (NST-Business Times, 2013). These statistics confirm that being mobile and connected is very much part of being Malaysian. Naturally, this phenomenon has also influenced the teaching and learning environment. All indications are that mobile learning will strongly impact Malaysian higher education. This is evidenced by the increase in research activities and initiatives in the area of mobile learning, particularly in the public and private universities. Other affirmative developments include the formation of the Mobile Learning Association of Malaysia (MLAM), which was officially registered on 21 January 2011; as well as the first 1st International Conference on Mobile Learning, Application and Services (mobilcase2012) that was held in September 2012.

Mobile learning research has been steadily increasing in Malaysia, though the deployment of mobile learning in higher education courses and programs has not been widespread due to several factors (Embi & Nordin 2013). The rapid growth in the smartphone industry in the last few years may precipitate a change. Smart mobile devices are notably becoming more accessible, affordable and widely used. This paper will chart the wave of change by first exploring the mobile learning research landscape in Malaysia and then explore how Malaysian higher education students are using mobile technologies for learning by comparing two different cohorts of a Malaysian private university separated by five years. The first study was conducted in mid-2008 and another

was conducted earlier this year to map how usage patterns of mobile devices for learning are changing.

The rise of mobile learning research in Malaysia

In line with the rest of the world, research focused around the use of mobile devices for learning and teaching is gradually gaining prominence in Malaysia. There are several significant research groups in the Malaysian higher education sector that are actively investigating mobile learning. A research team led by Professor Dr Mohamed Amin Embi and Dr Norazah Mohd Nordin at the National University of Malaysia researches and publishes extensively on mobile learning. Professor Embi is also the president of the MLAM. A recent publication entitled “Mobile learning: Malaysian initiatives and research findings”, is a collaborative effort from the National University of Malaysia and the Ministry of Higher Education, Malaysia (Embi & Nordin, 2013). The recent research focus for the team has been around the level of readiness for mobile learning of both teachers and students (Hamat, Embi & Hassan, 2013; Arif, Yazi, Radzi, Husin & Embi, 2013).

Another research team is based at the Faculty of Creative Multimedia, Multimedia University, Malaysia. Dr Koo Ah Choo leads the team as the chairperson of the Ubiquitous Similar Interest Group (formerly known as Mobile and Ubiquitous Learning) that actively conducts research related to mobile learning. Recent research studies include utilizing mobile devices for maths and science (Atan, Koo & Harji, 2010; Koo, Atan, Harji, Kiluwasha & Song, 2012), economic perspectives of mobile learning (Poon & Koo, 2010) and mobile interactions within the special needs community (Song & Anuar, 2010; Song, 2012). Another notable research team is from Open University, Malaysia. Led by Professor Dr Zoraiti Wati Abas, researchers from the Open University extensively research how mobile learning operates and functions in the open and distance learning environment (Abas, Lim & Mohamad, 2010; Abad, Lim & Ramli, 2011; Peng, Abas, Goolamally, Yusoff & Singh, 2011; Lim & Ramly, 2011; Lim, Abas & Fadzil, 2011; Lim, Fadzil, & Mansor, 2011).

Based in Penang, Professor Rozhan M. Idrus and his team from the Universiti Sains Malaysia are concerned with the functionality of mobile technologies and services in distance education (Idrus, 2013; Ismail, Gunasegaran, Koh & Idrus, 2010; Ismail, Idrus, Ziden & Rosli, 2010; Ramli, Ismail, & Idrus 2010). Researchers from the Universiti Teknikal Malaysia Melaka have also contributed to this area of research with studies on mobile pedagogical agents and web-based mobile-supported learning management systems (Salam, Hameed, & Bakar, 2013; Salam, Makina & Bakar, 2013). Other areas of mobile learning research are focused around studies of user perception (Tan, Ng & Lee, 2013; Rahamat, Shah, Puteh, Karim, Din, Aziz & Mahamod, 2013) and local cultural perspectives with respect to mobile learning (Arrifin, 2011; Arifin & Dyson, 2012).

Though there has been a marked increase in research activity around mobile learning in Malaysia since 2010, it wasn't clear if this was reflected in rates of adoption of mobile learning initiatives in higher education or whether students accessed mobile technologies informally for their learning. In order to determine if this was the case, results from a survey mapping students' use of mobile devices for learning from 2008 was compared and contrasted to the results obtained from another survey conducted second quarter of this year.

A Malaysian private university's perspective: then and now

Back in 2008, a group of researchers from a Malaysian private university conducted a survey with a large cohort of first year undergraduate Creative Multimedia students (n=270). The aim of the survey was to find out how students were using both their mobile and non-mobile devices for learning (Yuen, Song & Jong, 2008). The students ranged in age from 17 to 26 with 130 male students (56 per cent) and 101 female students (44 per cent) represented in the study. In this study, all students owned 2G or 3G feature phones, favouring Nokia or Sony-Ericsson phones. The majority of students (74 per cent) owned a desktop computer and 54 per cent owned a laptop computer. About a quarter of students (26 per cent) owned both a desktop computer and a portable laptop. Very few students owned a personal digital assistant (PDA) or portable handheld PC (2.6 per cent), but a large number of students (41.1 per cent) owned an iPod, MP3 or MP4 player.

The study conducted in 2008 asked students about the frequency of their use of digital devices for seeking information and news, particularly related to e-learning, references, seeking general information and for leisure (Yuen et al.) on a five point scale (1; Always, 2; Frequently, 3; Occasionally, 4; Seldom and 5; Never). The study found that a large proportion of students used non-mobile devices for accessing the university's Learning Management System (LMS) and for e-learning (M=3.27. SD =1.14), searching of reference databases (M=3.98. SD =1.04) and general information searches (M=3.42. SD =1.14). The use of mobile devices to support learning was less frequent and students mostly used mobile devices for entertainment, leisure and social purposes. The use of mobile technologies to access the LMS and for e-learning (M=1.4. SD =0.95), searching of reference

databases ($M=1.55$, $SD = 1.03$) and general information searches ($M=1.82$, $SD = 1.099$) was low.

A follow up study was carried out with a similar cohort of first year undergraduate Creative Multimedia students from the same private university but five years later, from May to June 2013. The aim of the study was to identify the types of mobile technologies owned by Malaysian students and whether these devices were being used to support learning. An online survey tool was developed and an email invitation was sent to all first year students enrolled at the university. The project was undertaken as part of a larger project to inform the development of a Mobile Learning Evaluation Framework in higher education (Murphy & Farley, 2012). The aim of the larger project is to develop a framework to facilitate the implementation of mobile learning within a range of higher education contexts.

Preliminary research findings on follow-up study

Responses were received from 200 students with the sample consisting of 114 (57 per cent) female participants and 86 (43 per cent) male participants; ranging in age from 19 to 43 with a mean age of 20. Students resided mostly with housemates or friends (81, 41 per cent) or in a residential college (43, 22 per cent). Some also resided in single accommodation off campus (31, 16 per cent) or with family or parents (30, 15 per cent). Some were living with a partner or children (7, 4 per cent). Participants spent a minimum of 5 hours and a maximum of 70 hours per week studying ($M=28.90$, $SD=23.04$). A few were employed in addition to studying (17, 9 per cent) and worked a minimum of 5 hours and a maximum of 48 hours a week.

Although the age and gender profiles of students in the 2008 study were similar to the present cohort, the levels of ownership of mobile technologies and other ICTs had changed drastically over the 5-year period. Nearly all students (except for 2) owned a mobile phone, yet smartphone ownership (81 per cent) greatly exceeded ownership of feature phones (43 per cent) (See Table 1). The number of students who owned a desktop computer had decreased to only 31 per cent and laptop ownership had risen to 92 per cent. Few students owned a tablet computer (19 per cent) yet 48 per cent had access to one for use. Net book computers (10 per cent) and eBook readers (4 per cent) were not owned by many students. A number of students owned multiple technologies with students owning a minimum of 1 and a maximum of 8 technologies ($M=4.86$, $SD = 1.69$). These two surveys also demonstrated how mobile technologies can appear while others disappear. For example, PDAs were present in the 2008 survey but had since completely disappeared; while tablets such as iPads have appeared over that same period.

Table 1: Percentage of students who own or have access to mobile technologies and other ICTs

	2008*	2013	
	Ownership	Usage (but not ownership)	Now ownership or access
Standard mobile phone	100	15.5	41.5
Smartphone	n.a.	13.5	6.0
MP3 player	41.1	15.5	45.0
Laptop	25.5	4.0	4.0
Desktop computer	48.5	38.5	31.0
E-book reader	n.a.	10.0	86.0
Tablet computer	n.a.	48.0	33.0
Netbook	n.a.	23.0	67.5
PDA	2.6	n.a	n.a

*The data from 2008 adopted from (Yuen, Song & Jong, 2008).

Students were requested to indicate which of the technologies that they owned or used were used to support learning. The laptop computer was used by nearly all students who had them to support their studies (95 per cent) and surprisingly 76 per cent of students who owned smartphones used them for learning activities. This is a drastic change from the previous study in 2008, which found that the usage of mobile devices for learning purposes were very low. The desktop computer was the only other technology used extensively for learning by those who owned them (54 per cent) and adoption of tablet computers (34 per cent) for learning activities was relatively low. Smartphones were mostly used for taking photos and videos to support learning (91 per cent), communicating on social media sites (79 per cent), taking notes (77 per cent) and sharing information with other students (74 per cent). Students also used smartphones for sending and receiving emails from course leaders or peers (61 per cent), accessing or reading course materials (57 per cent) and searching the internet for course related information (55 per cent). A third (34 per cent) of the students who owned smartphones used them for accessing the university's LMS.

Conclusion

Since 2010, research into mobile learning is becoming increasingly significant on the e-learning landscape in Malaysia. Though there are a number of mobile learning initiatives in higher education (Issham, Idrus et al. 2010), the adoption of mobile learning in higher education in this territory is not widespread. Even so, ownership of mobile devices is increasing rapidly in line with the rest of the world. The extent to which mobile device ownership is increasing among university students is evidenced by the two surveys done with similar cohorts of students at a Malaysian private university five years apart, in 2008 and 2013. In 2008, though all students owned mobile phones, none of these were smartphones and were used infrequently to support learning. In the 2013 survey, the types of devices owned by students had shifted considerably with some 80 per cent of students owning smartphones. All students surveyed owned or had access to at least one mobile device. Additionally, these devices were often used to support learning. The activities that these students engaged in were not formally planned in the context of courses and programs i.e. they were not formal learning *per se*, but instead supported formal learning activities.

It would seem that the increased research activity focused around mobile learning in higher education in Malaysia does correspond to an increasing use of mobile devices for learning by students. To determine if these trends are more widespread among Malaysian higher education students, additional surveys will also be deployed by the authors in other universities and tertiary institutions. Similar surveys will also be deployed in Vietnam, Thailand and China in order to determine if these trends are evident in other Asian countries. A thorough understanding of how students are already using their mobile devices to support learning could lead to the more effective and sustainable deployment of mobile learning initiatives across the sector.

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