Teaching via Mobile Phone: a Case Study on Malaysian Teachers' Technology Acceptance and Readiness

Issham Ismail *School of Distance Education Universiti Sains Malaysia, Malaysia*

Siti F Bokhare
School of Distance Education Universiti Sains Malaysia, Malaysia

Siti N Azizan
School of Distance Education Universiti Sains Malaysia, Malaysia

Nizuwan Azman
Advanced Medical and Dental Institute Universiti Sains Malaysia, Malaysia

Abstract

The purpose of this study is to identify the level of technology acceptance among school teachers from the components of awareness and motivation, training and courses, training design, and supports and facilities. This study also aims to investigate whether teachers' acceptance of technology could influence their readiness for the pedagogical use of mobile phone technology if it is to be implemented in school. A quantitative questionnaire was administered to thirty eight teachers who teach Information and Technology (IT) subject from different primary schools in Penang, Malaysia during a program on Teachers' Development. Data revealed that the level of technology acceptance among respondents in terms of awareness and motivation, training and courses, training design and supports and facilities was generally high. Despite this positive acceptance of technology, teachers' readiness for the use of mobile phone in teaching and learning was found to be at a considerably low level. However, the study identified a significant correlation between respondents' awareness and motivation towards technology with their readiness for the pedagogical usage of mobile phone. It was also found that gender is a possible factor influencing the respondents' readiness. As implication, this paper probes the influence of technology acceptance on teachers'

readiness for the pedagogical usage of mobile phone and the possible implications this influence affords.

Keywords: Teacher, Technology acceptance, Mobile learning, M-Learning, Readiness, Mobile phone software

Introduction

The rapid growth in Information Communication and Technologies (ICT) nowadays has brought amazing changes various fields, including education. Presently, there is a substantial increase of technological utilization for educational purposes. With the potentials ICT offers, educational institutions are now seeking for new paradigms to restructure their educational curricula and classroom facilities to bridge the existing technology gap education. This process however requires effective adoption of technologies into existing environment in order to provide learners with the required knowledge as well as to promote meaningful learning (Tomei, 2005).

An emerging paradigm in educational technology is mobile technologies, which mostly referred as mobile learning. By definition, mobile learning (m-learning) is learning through wireless technological devices that can be pocketed and utilized wherever the learner's device can receive unbroken transmission signals (Attewell and Savill-Smith, 2005). Above all, with the ubiquitous quality it offers, m-learning helps people to get instant learning just by the tips of their fingers. Even though m-learning offers exciting new frontiers in education and pedagogy (Shih and Mills, 2007), the implementation of m-learning at Malaysian school level is still considerably low. One possible reason is that, students in Malaysian schools are still prohibited from bringing mobile phones to school. Moreover, the real process of integrating m-learning into education system is indeed a complexity. Like ICT, m-learning implementation has to consider various educational aspects, such as curriculum and pedagogy, institutional readiness, teacher competencies and long-term financing

(Tinio, 2003). To handle with such drastic changes in education, not only students are expecting for supports of the new learning methodologies, teachers also need to be equipped with the acquired literacy and skills on the new educational technology.

Thus, researches that identify the right ingredients for a successful m-learning integration in schools are needed. For instance, Balanskat et al. (2007) identified the factors that influence the decision to adopt an innovation in schools as teacher-level, school-level and system-level. According to Sherry and Gibson (2002), technological, individual, organizational, and institutional factors should also be considered when examining ICT adoption and integration. This study identified teachers' readiness as one of the factors, while seeking whether there is any influence from their technology acceptance level.

Literature Review

Technology in Education

The emergence of evolving technologies leaves a significant impact on educational development. Many researchers reported their studies on the integration of technology in the process of teaching and learning as efforts to amplify students' performance, teaching effectiveness, as well as teachers' productivity (Wang et al., 2008; Jamil and Shah, 2011). In fact, Malik and Shabbir (2008) and Saba (2009) also emphasized on the effective usage of technology to produce new opportunities for self-directed learning as one of efforts to increase students' achievement.

The use of technology, namely ICT is viewed as a potentially powerful enabling tool, specifically for educational change and reform (Tinio, 2003). Plomp et.al (1996) identify three objectives of using ICT in education which includes the use of ICT as object of study, the use of ICT as aspect of a discipline or profession, and the use of ICT as medium for teaching and learning. In an earlier study

by Sheingold and Hadley (1990), it was also agreed that integrating technology is more than just helping people to use computers, but it is also for helping teachers to utilize it for learning. In fact, technology should make teaching and learning process easier and get along with it. Thus, technology integration in classrooms takes more than just having the facilities installed in schools; much consideration is needed to find the right way of how it can be utilized for education.

Technology Acceptance in Education

Achieving a significant usage of computer technology in the field of education can be influenced by many factors. According to Ertmer (1999), teachers would not automatically integrate technology into teaching and learning even if barriers such as access, time, and technical support were removed. Bingimlas (2009) identified several major barriers to successful ICT integration in teaching and learning environment, which include lack of confidence, lack of competence, and lack of access to resources. From the review of literatures by Mumtaz (2000), it was reported that the three interlocking factors that affect take-up of ICT are institution, resources and teacher. Overall, the literatures suggest that, teachers and institutions uptake on the technology in education plays an important role before the technology can successfully be embedded in the education system.

Teachers' technology acceptance is one of the issues being addressed by several scholars. Teo (2011) defined technology acceptance as a user's willingness to employ technology for the tasks it is designed to support. Thus, some of issues that relate to technology acceptance might be teachers' acceptance in terms of their awareness and motivation towards the use of technology in teaching and learning process. Teachers' awareness on pedagogical usage of technology plays important roles in determining whether they will use it in classrooms or not. In a research by Ngozi et al. (2010), it was reported that, even though the teachers could identify the specific technological tools which are useful for education, they however were not aware of in what way the tools can be used. Level of motivation among teachers was also seen to be related to a successful implementation of technology

within education system. A teacher's motivation is positively related to ICT use in the classroom (Karsenti et al., 2006). Sheingold and Hadley's survey (1990) suggested that teachers who were exceptional users of computers for teaching were also highly motivated. Therefore, awareness and motivation relates to each other. When users are aware of the value of a tool, they will be motivated toward the use of it (Solomon, 2003).

Besides awareness and motivational factors, teachers' professional development is also one of the key components that ensure a successful integration of technology into classroom teaching. Several studies have divulged that ICT-related training programs help to influence teachers' acceptance towards technology in classrooms (Hew and Brush, 2007; Keengwe and Onchwari, 2008). In addition, Mueller et al. (2008) also relates technology training to successful integration of technology in the classroom. Lawless and Pellegrino (2007) claimed that if a training program is effective, educators will be eager to involve it in pedagogical activities. Therefore, with just the right amount of training, teachers may wish to adopt and integrate ICT into their teaching. They may tend to not fully understand the impact and potentiality of technology in instruction (Ritchie & Rodriguez, 1996), but with enough training and experiences in using ICT, it would catalyze a jumpstart for teachers to make use of technology effectively for the purpose of teaching and learning.

It is also undeniable that institutional factor also plays a key role in determining teachers' well acceptance towards technology. Several studies have agreed that institutional supports have influenced teachers' perceptions toward educational benefits of certain technologies (Buabeng-Andoh, 2012; Gaffney, 2010; Lim and Khine, 2006). According to Tella et al. (2007), when planning introduction of new technology or when it is being used, implementing technical support or support services generally are very important. According to Jones (2004), teachers might not be willing to use the technology in classrooms if technical problems always occur and less attention is given by

the institution to fix the problem. It was further agreed by Eteokleous (2008) that organizational factor is one of the three categories of factors that influence teachers to integrate computers in the classroom. Lacking of regular supports would make teachers less likely to put priority on computer instruction (Eteokleous, 2008). Thus, it is clear in this sense that institution also plays a key role in determining teachers' direction toward technology integration in pedagogy.

M-learning

The evolution of handheld portable devices and wireless technology has resulted in radical changes in the people's lifestyles around the world, including for learning. Mobile learning or m-learning is a rising art of using mobile technologies to enhance the learning experience. As been highlighted by Peters (2007), mobile technologies can significantly reduce people's dependence on fixed locations, and thus have the potential to revolutionize the way people work and learn. In fact, some other studies also indicate the potential of mobile technologies in assisting the teaching and learning process in school (Tan and Liu, 2004; Chen et al., 2003; Costabile et al., 2008).

For the case of Malaysia, the adoption of m-learning is still considerably at infancy. Though, some research has been conducted to study the potential of mobile technologies in enhancing classroom teaching-learning activities in Malaysian schools. As examples, the potentials of mobile technologies were studied for English vocabulary learning in secondary schools (Mohamad and Woollard, 2009), English language literature (Rahamat et al., 2011) and mathematics for primary schools (Mahamad et al., 2010). Even more interesting, it was reported by the Deputy Education Minister that students will be allowed to bring their mobile phone to schools starting from 2013 (Loo, 2012). Thus, these potentials signal the area of research that studies the potential of m-learning in enhancing the pedagogical practices for Malaysian mainstream schooling.

Factors influencing readiness for m-learning

Readiness to use technology is defined as “people’s propensity to embrace and use new technologies for accomplishing goals in home life and at work” (Parasuraman, 2000). Parasuraman (2000) also proposed “Technology Readiness Index” (TRI) to identify the lead users in the context of new technology-based services. The context may include the educational aspect of services. With regards to education, Yun and Murad (2006) claimed that there are two factors that influence readiness for e-learning: psychological readiness and technical skill readiness. Chapnick (2000) who developed an instrument for assessing readiness for e-learning, had listed eight categories of factors to assess readiness, which are psychological, sociological, environmental, human resources, financial readiness, technological skills, equipment and content readiness.

In terms of mobile technologies for education, several international studies have identified some factors which influence users’ readiness for m-learning. Some studies have found demographic influences on users’ readiness for m-learning, such as gender (Trifonova et al., 2006), age (MacCallum and Jeffrey, 2009) and educational level (Nwagwu, 2001). Trifonova et al. (2006) also studied users’ readiness for learning by relating it to technology acceptance parameters. Later, Cheung et al. (2011) named three key factors to a successful mobile learning adoption, which are technological feasibility, students’ needs and pedagogical benefits. From a Malaysian perspective, Chong (2011) investigated the key factors that influence the attitude towards using m-learning. The key factors include perceived ease of use, perceived usefulness, quality of services, and cultural factors. In Malaysia, although still in infancy, m-learning is also being studied, particularly with respect to users’ readiness for consideration of implementation into higher education. University students were found to be more interested in the benefits of mobile learning (Amin et al., 2009), ready to embark into it (Abas et al., 2009), satisfied with use it, (Ismail et al., 2010), and seemed to prefer game-like mobile learning applications (Hashim et al., 2007).

While there were studies that reported on Malaysian university students' readiness for m-learning, research that explored m-learning readiness from Malaysian schools' perspectives were still scarce. Furthermore, of the studies reviewed, none focused on Malaysian educators' perceptions towards the pedagogical use of mobile phones in school. Relationship between their technology acceptance and readiness for m-learning is also an area ripe for research.

Methodology

The purpose of this study was to identify teachers' acceptance of technology and their readiness for m- learning via mobile phone.. The study also sought to identify possible demographic factors which may influence respondents' readiness for m-learning. To accomplish this, a quantitative survey technique developed by researchers based on own literature reviews was utilized.

The Study

The research study described in this paper was carried out in order to answer the following research questions:

- What is the level of technology acceptance among teachers?
- How do respondents use their mobile phones?
- Are respondents ready for using mobile phone as pedagogical tool?
- Is there any relationship between demographic factors and respondents' readiness for m-learning?
- Is there any correlation between respondents' technology acceptance and readiness for m-learning?

Participants

This research involved 38 teachers who taught IT subjects at different primary schools in Penang, Malaysia. The respondents were chosen because of their knowledge of educational technologies. The participants were deemed to be well-familiar with at least basic technological tools in teaching and learning at their school. The surveys were administered to the respondents during the Teachers'

Development Program conducted at a school. 38 surveys were sent out, where all sets were returned and examined. Thus, the response rate for the instrument was 100%.

While the sample size was too small to have the findings be generalizable, the findings can provide valuable insights into the body of research on teaching via mobile phone technologies.

Table 1 (Appendix B) summarized the demographic profiles of all respondents. Of those, 30 were female (78.9%), where 26.3% of total respondents were between 25 to 29 years old. 60.5% of respondents were Malay and most of respondents were married (86.8%). In terms of academic qualification, the highest levels achieved by most respondents were Degree (44.7%) and followed by Diploma (36.8%). Only 7.9% of respondents had achieved Masters Level. Overall, there were two distinct groups of respondents according to their year of service as teachers, which are 5 years and less (36.8%) and more than 20 years (26.3%).

Data Sources

Data for this study was collected by using a quantitative questionnaire. All scales and items used in the instrument were developed by the researchers after a review of related literature. The face and content validity of the questionnaire were evaluated by experts in the faculty and related field. The questionnaire was pilot tested with undergraduate student teachers in the university.

The questionnaire consisted of four sections. The first section was the demographic section (age, gender, marital status, ethnicity, academic qualification level, and years of service as a teacher). Section B consisted of 26 questions which asked respondents to evaluate the effectiveness of the Self Development program. From Section C, the level of respondents' acceptance on the use of technology at schools was evaluated based on four variables, which are awareness and motivation, training and courses, design of training and courses, and supports and facilities. This section utilized five-point Likert scales from "Strongly Disagree" (1) to "Strongly Agree" (5). The forth section,

Section D, consisting of two parts, requested respondents to evaluate their perceptions on the effectiveness of mobile learning at their schools and for their future. There were three items in the first parts which collected general information on respondents' usage of mobile phone. The second parts consisted of eleven items which asked respondents' perceptions on mobile learning. The eleven items were rated based on five-point Likert-type scale, rating from "1" for "Strongly Disagree" to "5" for "Strongly Agree". The internal consistency of items pertaining to this section was measured by Cronbach's Alpha. It was found to be 0.928 which exceeded 0.9. Thus, the reliability of the items was deemed to be excellent (George and Mallery, 2003).

Data Analysis

All data were ported into statistical software, SPSS 17.0 (2012) for statistical analysis. Reliability analysis was used to test the reliability coefficient of the instrument. To ensure the normality of the distribution, descriptive statistics was employed. Frequency analyses were also used to detail out the distribution of responses for each item within categories. Pearson product-moment correlation was applied to the data to find the relationship between all components of technology acceptance with readiness for m-learning. Chi-Square and Crosstab analyses were also used to determine whether there was any association between demographic factors with respondents' readiness for m-learning. Unless stated, all other statistical analyses reported were conducted with a significant level of 0.05. Prior to analyses on relationships among scale variables, normality checks were performed for each of the scales of technology acceptance and m-learning readiness. Histograms demonstrated that the responses for both scales were widely spread throughout all items, with some indicated at the minimum level and some others at the maximum scores. Thus, the scales appeared to be following the bell curve model. Mean value for m-learning scale was 2.98, located at the middle of the scale spectrum. However, the mean for technology acceptance scale was 4.2, suggested that all mean values lie between 3 and 5. Standard deviations for both scales were relatively low (0.379 and 0.942), indicating a low deviation from norm and thus, signified a normal distribution and consistency in the

data sampling. From the skewness statistics, the values fall within -1 and +1 which were -0.47 for technology acceptance and -0.033 for m-learning readiness. Hence, these values signified and further confirmed a normal distribution of each scale.

Results

Data pertaining to the different variables was entered in the SPSS statistical program using the appropriate codes. The main experimental results are presented in the following section reflecting to the identified research questions:

Acceptance of Technology in Teaching and Learning

Acceptance of technology among respondents was studied from four components, which were awareness and motivation, training and courses, training design and supports and facilities. Positive responses gathered from each component will lead to positive acceptance of technology among the respondents.

Awareness and motivation. Detailed analyses of the collected data regarding awareness and motivation were summarized in Table 2. As indicated, most teachers responded positively regarding their awareness and motivation to use technology in education (mean values above 4.00). Although some might not quite familiar with new educational technologies (mean value 3.95), highest mean values of 4.39 suggested that most respondents agreed on the benefit of technology in gathering students' interest, and thus expressed their willingness to adopt new technologies into their classroom. Overall, the analyses indicated that the teachers were aware and feel motivated to use technology in their teaching and learning process.

Training and courses. Table 3 reported the teachers' responses regarding their willingness to attend training and courses related to technology applied in the classrooms. Overall, all respondents agreed that they are willing to attend necessary training and courses on technology to increase their knowledge and skills (all mean values were above 4.0).

Training design. Results from Table 4 also indicated positive responses from the teachers regarding their technology acceptance. All respondents perceived that the design of content for their training is also a crucial factor that determines their acceptance of technology. They agreed that they need training which relates to their profession, matches their needs, reasonable to their time and condition, and being conducted by experienced trainers.

Supports and facilities. The teachers' evaluations on supports and facilities being provided to them for applying technologies in the classrooms were shown in Table 5. Generally, most respondents gave positive responses regarding the technological supports and facilities they received. Although the physical facilities may need some upgrades (mean value 3.97), most of teachers agreed that the supports and facilities were supportive and effective to increase their credibility, encourage participants, and assist them in practicing new methods.

Technology acceptance. The internal consistency of the items pertaining to all four components of technology acceptance was measured by Cronbach's alpha. As reported in Table 6, they were found to be 0.839 (awareness and motivation), 0.846 (training and courses), 0.748 (training design) and 0.876 (supports and facilities). These values exceeded the conventional minimum 0.70 (Nunnaly, 1978). Thus the reliabilities of components were deemed to be good.

Table 6 also indicated the mean values of all components of technology acceptance, where all values exceeded 4.0. All respondents in the study were aware and motivated, willing to attend courses and training, concerned on the training design, and provided with necessary supports and facilities for applying technology in their classrooms. Hence, it can be concluded that the level of technology acceptance among teachers in this study was high.

Usage of Mobile Phone

From Figure 1, it can be seen that majority of respondents agreed that using mobile phone is easy for them. Hence, it can be assumed that most of them were well-familiar with mobile phone technology. As for their most frequently used mobile phone application, Figure 2 illustrated a balanced usage by the respondents between sending SMS and making calls. Thus, half of total respondents might prefer SMS as their medium for communicating via mobile phones. Despite this, most respondents were non-avid SMS senders. As illustrated in Figure 3, 71.05% of total respondents sent not more than ten SMS only per day. Overall, the analysis on mobile phone usage suggested that respondents were well familiar with mobile phone technology, but the use of SMS among them appeared to be low.

Readiness for M-learning Via Mobile Phone

Another primary study this research sought to find was regarding teachers' readiness to embrace mobile phone technologies for their teaching activities. There were eight items in the questionnaire which related to teachers' readiness. Table 6 contains statistics pertaining to the distribution of respondents' responses on these items. Overall, the results suggested that most teachers did not quite agree on the use of mobile phone for teaching-learning in classroom (all mean values below 4.0). The most critical aspect which they did not perceive as good was on the use of mobile phone to assist teaching and learning process in school (mean = 2.16). Even though most respondents supported the role of mobile phones as communication tools (mean = 3.57), they did not find that teaching and learning via mobile phone is reliable, encouraging, and beneficial to education in the future. Hence, these findings suggested that majority of respondents were skeptical towards m-learning and thus were not ready to use mobile phone as a tool to assist the teaching and learning process at their school.

Factors Influencing M-learning Readiness

Crosstab analyses were used to discover if there was any relationship between respondents' demographic factors with their readiness towards M-Learning. This analysis was performed on two items of M-Learning readiness with lowest mean values (mean values: 2.16 and 2.32). As can be

seen, the two items were generally implying that most respondents did not perceive M-Learning to be beneficial in assisting teaching and learning process at schools. Results were summarized in Tables 8 and 9.

From Table 8, it can be seen that there was a significant relationship between gender and respondents' perceptions on whether or not mobile phone is helpful in supporting their teaching at schools. The male group appeared to be more receptive towards m-learning than the female group (Agree: Male = 12.5%, Female = 3.3%). On the other hand, the Chi-square test reported that there were no statistically significant associations between respondents' ethnicity, marital status, qualification level, and years of services with their perceptions on the role of mobile phones in assisting teaching process at schools.

Table 9 contained results pertaining to the relationships between respondents' demographic factors and their perceptions on whether or not the use of mobile phones are helpful in encouraging students to learn. Likewise, the Chi-square test from this research question also confirmed the significant association between gender and the aforementioned item. Furthermore, this association was similar to the previous crosstab analysis where, comparing to the female group, male group were mostly agreed that mobile phones are helpful in encouraging students to learn. In spite of the significant association between the item and gender, the analysis did not report any statistically significant association between respondents' perceptions on the role of mobile phones in encouraging students to learn and other demographic factors. Thus, the crosstab analyses suggested that, the respondents' perceptions towards the roles of m-learning in assisting teaching and learning at schools were dependent on gender factor. Specifically, male group appeared to be more keened towards m-learning than the female group.

Thus, both analyses showed that being a male or female did influence respondent's perception towards m-learning. On the other hand, other demographic factors were of consequence to respondents' perceptions.

Correlation between technology acceptance and m-learning readiness

The main objective of this research was to identify whether teachers who accepted technology in education will be ready for m-learning via mobile phone at their schools. Thus, Pearson correlation analyses were used to study whether teachers' readiness for m-learning was influenced by any component of technology acceptance described previously. The results of the analyses were summarized in Table 10. It can be seen that there was a significant positive correlation between teachers' readiness for m-learning with their awareness and motivation to use technology in education (at 0.01 confidence level). Thus, teachers' readiness for m-learning would be most likely increasing if their awareness and motivation to use technology was also increasing. In contrary, there were no significant correlations between readiness for m-learning with other three components of technology acceptance.

Discussion

Users' acceptance and readiness have been globally recognized as some important factors in the success of incorporating technology in education. As stated earlier, the present study intends to ascertain the level of technology acceptance among school teachers, as well as to investigate their readiness to embrace mobile phone technologies in education. Then, the study looked into how do these two perceived values correlate to each other in order to suggest the future direction of m-learning implementation in Malaysian schools.

Regarding the technology acceptance, this study revealed that the level of technology acceptance among teachers from all components (awareness and motivation, training and courses, training

design, and supports and facilities) was high. This finding aligns with the results of some research in Malaysia which reported teachers' positive perceptions towards technology (Sim and Theng, 2007; Lau and Sim; 2008; Sa'ari et al., 2005). These studies reported similar findings whereby the use of technology in education is perceived well among teachers since they were aware on ICT benefits to their classes (Sim and Theng, 2007), demanded for extra supports and facilities (Lau and Sim, 2008), and have positive attitudes toward new technologies (Sa'ari et al., 2005). This can be explained from the emphasis and extra efforts put by the Malaysian Ministry of Education in increasing IT skills among the school teachers. In line with this agendum, in-service trainings are widely provided to the Malaysian school teachers to upgrade their professional skills and competencies, which include IT skills. Taken together, Malaysian school teachers nowadays are expected to be more receptive toward technology integration in education.

Although the finding above gave the sense about teachers' well perceptions toward the incorporation of technology in education, it did not guarantee that the teachers would be ready for the pedagogical uses of mobile phone. It was found in this study that the level of respondents' readiness for pedagogical usage of mobile phone was low. Specifically, they were skeptical about how mobile phone can be beneficial for assisting teaching and learning process at their school. Several reasons may account for this. First, the use of mobile phone among students in schools is long being prohibited in Malaysia. Thus, teachers might not be able to see the practicality of using the device as a pedagogical tool. Second, this result may also stem from the respondents' low mobile phone usage for SMS. Findings in this study revealed that, even though the respondents were well familiar with mobile phone technology, their SMS usage appeared to at low level. This is supported by Türel and E. Johnson (2012) who reported that the frequency and duration of technology usage are some important indicators of technology acceptance. This finding can also be explained by several studies conducted by Malaysian scholars who found that teachers are generally passive towards integrating

new technologies into their classroom (Darus and Luin, 2008; Luan et al., 2010; Hamzah et al., 2009) and most comfortable with only familiar technologies (Rashid and Gloeckner, 2008).

This study also provides some insights on the gender factor in association with teachers' perceptions towards the use of mobile phone as pedagogical tools. Specifically, a significant difference was confirmed between male and female teachers concerning their perceptions on the roles of mobile phone in assisting teaching-learning activities. Male teachers appeared to be more receptive toward the use of mobile phone as assisting tool for teaching and learning at schools. This gender difference in perceiving the pedagogical usage of mobile phone may be explained by a higher mobile phone usage among male Malaysians. According to Kahveci et al. (2011), device ownership determines teachers' perceptions toward its benefits for education. Furthermore, as reported by the Malaysian Communication and Multimedia Commission, MCMC (MCMC, 2009; MCMC, 2010), the percentages of male mobile phone users remained higher than the female users from year 2005 until 2010. This result agrees with findings of Humble-Thaden (2011), Wang et al. (2009) and Lan and Huang (2012) that there is a gender difference between male and female respondents in perceiving the pedagogical use of mobile phone.

There was a significant positive correlation between teachers' awareness and motivation to use technology with their readiness towards m-learning via mobile phone. In other words, this significant correlation indicates that teachers who are more aware and motivated to use technology in classes were more likely to be ready for m-learning via mobile phone in their schools. This finding is in accordance with Alzaza's (2012) results – respondents 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. Furthermore, 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. In terms of motivation to use technology as a factor, this result concurs with other similar study by Jones et al. (2006) who reported that, experienced users who are motivated will look for new ways to make the device they owned suitable for educational purposes.

Future Research Directions and Conclusions

M-learning via mobile phone in Malaysian schools is now possible. The Malaysian government has just recently announced that, starting from the year 2013, students shall no longer be prohibited from bringing their mobile phone to school. Practically, this change does shed some light on the potential of using the device as pedagogical tool. Even though it sounds promising, a lot of things need to be considered first, including teachers' perceptions on technology and readiness for m-learning. As key players that navigate students' learning process, teachers should also be given opportunities to express their perceptions towards any technology. Due to the fact that m-learning via mobile phone is still considerable embryonic in Malaysia, there are scarce literatures on teachers' readiness for this new technology from Malaysian perspective. Thus, findings from this study enrich the literature regarding Malaysian teachers' readiness for pedagogical usage of mobile phone in classroom teaching. At the same time, this study explored to which extent this readiness is affected by the teachers' acceptance of technology.

However, the present study has some limitations that need to be taken into consideration. Due to the relatively small sample size, a broader generalization from the data is difficult to make. Other than that, this paper also focused only on the demographic profiles and technology acceptance components as factors influencing teachers' readiness for m-learning. Other factors, such as prior experience with technology, teaching skills, and personality type, were not taken into account. This in turn may lead to studies that help establishing the feasibility of utilizing mobile phone in enhancing the existing classroom practices in Malaysian schools.

In conclusion, findings from this survey do provide promising indications and clues on teachers' technology acceptance as the predictors of their readiness for m-learning via mobile phone. Even though mobile technology is predicted as a boon for future education, educational providers must take note that technology integration in schools takes time: time for institutions to be well-equipped, time for teachers to be skillful and time for students to adapt to it.

Acknowledgment

This research was supported by Universiti Sains Malaysia [1001/PJJAUH/816155].

References

Abas, Z.W., Peng, C.L. & Mansor, N. (2009). *A study on learner readiness for mobile learning at Open University Malaysia*. Paper presented at IADIS International Conference Mobile Learning 2009, Barcelona, Spain.

Alzaza, N.S. (2012) . *Opportunities for utilizing mobile learning services in the Palestinian Higher Education*. Retrieved August 13, 2012 from http://www.iajet.org/iajet_files/vol.2/no.4/Opportunities%20for%20Utilizing%20Mobile%20Learning%20Services%20in%20the%20Palestinian%20Higher%20Education.pdf

Amin, A. H. M., Mahmud, A. K., Abidin, A. I. Z., Rahman, M. A., Iskandar, B. S., & Ridzuan, P. D. (2006). m-Learning management tool development in campus-wide environment. *Issues in Informing Science and Information Technology*, 3, 423-434.

Attewell, J. & Savill-Smith, C. (2005). *Mobile learning anytime everywhere*. London, UK: London: Learning and Skills Development Agency.

Balanskat, A., Blamire, R., & Kafal, S. (2007). *A review of studies of ICT impact on schools in Europe* European Schoolnet .

Bingimlas, K.A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *EURASIA Journal of Mathematics, Science and Technology Education*, 5*(3), Special Issue: Australia* 235-245.

Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: a review of literature. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 8*(1), 136-155.

Chapnick, S. (2000). Are you ready for e-learning? *Learning Circuits: ASTD's Online Magazine All About ELearning*, Retrieved July August 31, 2012, from, http://www.learningcircuits.org/2000/nov2000/Chapnick.htm.

Chen, Y.S., Kao, T.C. & Sheu, J.P. (2003). A mobile learning system for scaffolding bird watching learning. *Journal of Computer Assisted Learning*, *19*, 347–359. doi: 10.1046/j.0266-4909.2003.00036.x

Cheung, S. K. S., Yuen, K. S., & Tsang, E. Y. M. (2011, 9-11 Dec. 2011). *A study on the readiness of mobile learning in open education.* Paper presented at the IT in Medicine and Education (ITME), 2011 International Symposium on.

Chong, J.-L., Chong, A. Y.-L., Ooi, K.-B., & Lin, B. (2011). An empirical analysis of the adoption of m-learning in Malaysia. *International Journal of Mobile Communications, 9*(1), 1-18. doi: 10.1504/ijmc.2011.037952

Costabile, M. F., Angeli, A. D., Lanzilotti, R., Ardito, C., Buono, P., & Pederson, T. (2008). *Explore! possibilities and challenges of mobile learning*. Paper presented at the Proceedings of the Twenty-Sixth Annual SIGCHI Conference on Human Factors in Computing Systems, Florence, Italy.

Darus, S., & Luin, H. W. (2008). Investigating teachers' use of computers in teaching English: A case study. *Teaching English with Technology, 8*(1), 1-18. Retrieved August 13, 2012, from http://www.iatefl.org.pl/call/j_article30.htm

Ertmer, P. A. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development, 47*(4), 47–61.

Eteokleous, N. (2008). Evaluating computer technology integration in a centralized school system. *Computers & Education, 51*(2), 669-686. doi: 10.1016/j.compedu.2007.07.004

Gaffney, M. (2010). Enhancing teachers' take-up of digital content: Factors and design principles in technology adoption. August 30, 2012,

from http://www.thelearningfederation.edu.au/verve/_resources/Enhancing_Teacher_Takeup_of_Digital_Content_Report.PDF

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Hamzah, M. I., Ismail, A., & Embi, M. A. (2009). The impact of technology change in Malaysian smart schools on Islamic education teachers and students. *International Journal of Human and Social Sciences*. 4(11), 824-836.

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: current knowledge gaps and recommendations for future research. *Educational Technology Research and Development, 55*, 223-253.

Humble-Thaden, M. B. (2011). Student reflective perceptions of high school educational cell phone technology usage. *The Journal of Technology Studies, 37*(1), 10-16.

Ismail, I., Gunasegaran, T., Koh, P.P. & Idrus, R.M. (2010). Satisfaction of distance learners towards mobile learning in the Universiti Sains Malaysia. *Malaysian Journal of Educational Technology, 10*(2), 47-54.

Jamil, M., & Shah, J. H. (2011). Technology: its potential effects on teaching in higher education. *New Horizons in Education, 59*(1), 38-51.

Jones, A. (2004). A Review of the research Literature on barriers to the uptake of ICT by teachers. *British Educational Communications and Technology Agency*. Retrieved August 30, 2012 from http://www.becta.org.uk.

Jones, A., Issroff, K., Scanlon, E., Clough, G., & McAndrew, P. (2006). Using mobile devices for learning in informal settings: Is it motivating? In *Proceedings of IADIS Mobile Learning 2006* (251-255), Dublin, Ireland.

Kahveci, A., Sahin, N., & Genc, S. (2011). Computer perceptions of secondary school teachers and impacting demographics: A Turkish perspective. *The Turkish Online Journal of Educational Technology, 10*(1), 71 – 80.

Karsenti, T., Villeneuve, S. & Goyer, S. (2006). The impact of motivation on prospective teachers' use of information and communication technologies (ICTs). In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2006* (pp. 1659-1666). Chesapeake, VA: AACE.

Keengwe, J., & Onchwari, G. (2008). Computer technology integration and student learning: Barriers and promise, *Journal of Science Education and Technology, 17*, 560–565.

Lan, Y.-F., & Huang, S.-M. (2012). Using mobile learning to improve the reflection: A Case study of traffic violation. *Educational Technology & Society, 15* (2), 179–193.

Lau, B.T. & Sim, C.H. (2008). Exploring the extent of ICT adoption among secondary school teachers in Malaysia. *International Journal of Computing and IT Research, 2* (2),19-36.

Lawless, K., & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns and ways to pursue better questions and answers. *Review of Educational Research, 77*(4), 575-614.

Lim, C.P. & Khine, M.S. (2006). Managing teachers' barriers to ICT in Singapore schools. *Journal of Technology and Teacher Education, 1*, 97-125.

Loo, T.E. (2012, July 16). Students can take handphones, IT gadgets to school from 2013. *The Star*. Retrieved from http://thestar.com.my/news/story.asp?file=/2012/7/16/nation/20120716193345&sec=nation

Luan, W. S., Atan, H., & Sabudin, S. (2010). Exploring teachers' perceptions of their pedagogical role with computers: a case study in Malaysia. *Procedia - Social and Behavioral Sciences, 2*(2), 388-391. doi: 10.1016/j.sbspro.2010.03.031

MacCallum, K., & Jeffrey, L. (2009). Identifying discriminating variables that determine mobile learning adoption by educators: an initial study. Retrieved August 21, 2012 from http://www.ascilite.org.au/conferences/auckland09/procs/maccallum.pdf

Mahamad, S., Ibrahim, M.N., & Taib, S.M. (2010).M-learning: A new paradigm of learning mathematics in Malaysia. *International Journal of Computer Science & Information Technology, 2*(4), 76-86.

Malaysian Communications and Multimedia Commission (MCMC) Report (2009). *Hand phone users survey 2009.* Retrieved August 12, 2012 from http://www.skmm.gov.my/skmmgovmy/files/attachments/HPUS-2009.pdf

Malaysian Communications and Multimedia Commission (MCMC) Report (2010). *Hand phone users survey 2010.* Retrieved August 12, 2012 from http://www.skmm.gov.my/skmmgovmy/files/attachments/HPUS%202010.pdf

Malik, S. & Shabbir, M.S. (2008). Perceptions of university students on self-directed learning through learning technology. *European Journal of Scientific Research, 24*(4), 567-574.

Mueller, J., Wood, E., Willoughby, T., Ross, C., & Specht, J. (2008). Identifying discriminating variables between teachers who fully integrate computers and teachers with limited. integration. *Computers & Education, 51*(4), 1523-1537.

Mumtaz, S. (2000). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of Information Technology for Teacher Education, 9*(3), 319-342. doi: 10.1080/14759390000200096

Ngozi, O.D, Ngozi, A.E, & Joy, E.O. (2010). Teachers' awareness of the existence and the use of technology to promote children's literacy instruction. *African Journal of Teacher Education, 1*(1), 115-125.

Nunnally, J.C. (1978). *Psychometric theory*. NY: McGraw-Hill.

Nwagwu, W. (2001). Factors influencing the adoption of mobile telephony by students at the University of Ibadan, Nigeria. Retrieved August 31, 2012 from http://acrulet.net/yahoo_site_admin/assets/docs/72nwagwuodetumibi.205102350.pdf

Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2(4): 307–320.

Peters, K. (2007). M-learning: positioning educators for a mobile, connected future. In *The International Review of Research in Open and Distance Learning*, *8*(2). Retrieved August 16, 2012, from www.irrodl.org/index.php/irrodl/article/view/350/894

Plomp, T., Brummelhuis, A. C. A. & Rapmund, R. (1996). Teaching and learning for the future. Report of the Committee on MultiMedia in Teacher Training. Den Haag: SDU.

Rahamat, R., Shah, P., Din, R., & Aziz, J.A. (2011). Students' readiness and perceptions towards using mobile technologies for learning the English language literature components. Retrieved August 31, 2012 from http://www.melta.org.my/ET/2011/69_84_Rashidah%202011.pdf

Rashid, A. M., & Gloeckner, G. N. (2008). Information and learning technology (ILT) among career and technical teachers in Malaysia. *Electronic Journal on Information System in Developing Countries*, *33*(4), 1-20. Retrieved, August 13, 2012 from http://www.ejisdc.org

Ritchie, D. and Rodriquez, S. (1996). School administrators and educational technologies: Narrowing the divide. *Journal of Information Technology for Teacher Education, 5*(1/2), 107-114.

Sa'ari, J.R., Luan, W.S., & Roslan, S. (2005). Attitude and perceived information technology competency among teachers. *Malaysian Online Journal of Instructional Technology*, *2*(3), 70-77

Saba, A. (2009). Benefits of technology integration in education. Retrieved August 27, 2012 from http://edtech2.boisestate.edu/sabaa/502/Saba_Synthesis_Paper.pdf

Sheingold, K., & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice.* New York: Center for Technology in Education, Bank Street College of Education.

Sherry, L., & Gibson, D. (2002). The path to teacher leadership in educational technology. *Contemporary issues in technology and teacher education*, *2* (2), 178-203.

Sim, J.C.H. & Theng, L.B. (2007). Teachers' perceptions of the use of ICT as an instructional tool in Mathematics and Science. Retrieved July 24, 2012, from http://ictl.intimal.edu.my/ictl2007/proceeding/Full_Paper/1A-03-Paper%2069%20%28Malaysia%29.pdf

Shih, Y., & Mills, D. (2007). Setting the new standard with mobile computing in online learning. *The International Review of Research in Open and Distance Learning*, *8*(2). 1-16.

Solomon, G. (2003). Project-based learning: a premier. Retrieved August 27, 2012, from http://pennstate.swsd.wikispaces.net/file/view/PBL-Primer-www_techlearning_com.pdf

SPSS 17.0. Statistical Software (2012). NY: International Business Machines.

Tan T.H. & Liu T.Y. (2004). The Mobile-based interactive learning environment (MOBILE) and a case study for assisting elementary school English learning. In *Proceedings of the 4th IEEE Conference on Advanced Learning Technologies* (eds C.Kinsuk, K.Looi, E.Sutinen, D.Sampson, I.Aedo, L.Uden & E.Kähköhnen), pp. 530–534. IEEE Computer Society, Los Alamitos, CA.

Tella, A., Tella, A., Toyobo, O. M., Adika, L. O. & Adeyinka, A. A. (2007). An assessment of secondary school teachers uses of ICT: Implications for further development of ICT use in Nigerian secondary schools. *Turkish Online Journal of Educational Technology*, *6* (3), 5-17.

Teo, T. (2011). Technology acceptance in education. Retrieved August 27, 2012, from https://www.sensepublishers.com/files/9789460914874PR.pdf

Tinio, V. L. (2003). *ICT in education*. Bangkok: UNDP-Asia Pacific Development Information Programme (APDIP). Retrieved August 13, 2012 from http://www.apdip.net/publications/iespprimers/eprimer-edu.pdf

Tomei, L. A. (2005). *Taxonomy for the technology domain*. USA: Information Science Publishing.

Trifonova, A., Georgieva, E., & Ronchetti, M. (2006). Determining students' readiness for mobile learning. In *Proceedings of the 5th WSEAS International Conference on E-ACTIVITIES* (ELearning, E-Communities, E-Commerce, EManagement, E-Marketing, E-Governance, Tele-Working) (E-ACTIVITIES'06), Venice, Italy.

Türel, Y. K., & Johnson, T. E. (2012). Teachers' belief and use of interactive whiteboards for teaching and learning. *Educational Technology & Society, 15* (1), 381–394.

Wang, M., Shen, R., Novak, D., & Pan, X. (2009). The impact of mobile learning on students' learning behaviours and performance: Report from a large blended classroom. *British Journal of Educational Technology, 40*, 673–695. doi: 10.1111/j.1467-8535.2008.00846.x

Yun, G., & Murad, M. (2006). Factors influencing psychology and skills of the secondary school teachers' e-learning readiness: A case study in Malacca, Malaysia. *Fourth International Conference on Multimedia and Information and Communication Technologies in Education (M-ICTE 2006).* Retrieved August 31, 2012, from http://www.formatex.org/micte2006/pdf/2135-140.pdf .

APPENDIX A

(Survey Instrument)

SCHOOL OF DISTANCE EDUCATION

QUESTIONNAIRE ON PROGRAM EFFECTIVENESS AND SCHOOL TEACHERS' ACCEPTANCE TOWARD THE USE OF MOBILE PHONE AS TEACHING AND LEARNING TOOL

PART A : DEMOGRAPHIC

1. AGE

20-24	☐
25-29	☐
30-34	☐
35-39	☐
40-44	☐
45-49	☐
50 and above	☐

2. SEX

Male ☐ Female ☐

3. MARITAL STATUS

Single ☐ Married ☐ Single Parent

4. ETHNICITY

Malay ☐ Chinese ☐ India ☐

Others (Please state) _____

5. ACADEMIC QUALIFICATION

Masters	☐
Degree	☐
Diploma	☐
Pre-university	☐

6. YEAR OF SERVICE

Less than 5 years	☐
6 - 10 years	☐

11 - 15 years	
16 - 20 years	
More than 20 years	

PART B: PROGRAM EFFECTIVENESS

7. How effective is the program to you? Please mark (/).

Very ineffective	1	2	3	4	5	Very effective

a.	Create identity	1	2	3	4	5
b.	Increase maturity	1	2	3	4	5
c.	Become more knowledgeable	1	2	3	4	5
d.	Increase passion to teach and learn	1	2	3	4	5
e.	Become more responsible	1	2	3	4	5
f.	Appreciate time more	1	2	3	4	5

8. How responsible are you to your students? Please mark (/).

Strongly disagree	1	2	3	4	5	Strongly agree

a.	I have to be ready to prepare extra classes for my students	1	2	3	4	5
b.	I always assist my students in widening their spiritual potential	1	2	3	4	5
c.	My students' needs are more important than mine	1	2	3	4	5
d.	I always assist my students in widening their intellectual potential	1	2	3	4	5
e.	Students' information are confidential and cannot be exposed	1	2	3	4	5

9. How responsible are you to your profession and colleague? Please mark (/)

Strongly disagree	1	2	3	4	5	Strongly agree

a.	I dress properly and ethically according to the religion	1	2	3	4	5
b.	I am proud to receive promotions based on my performance	1	2	3	4	5
c.	I always apply for in-service courses	1	2	3	4	5
d.	I always try to increase my knowledge level	1	2	3	4	5
e.	It is not proper to greet your colleagues with improper words	1	2	3	4	5
f.	I always practice moral behaviors in my teaching profession	1	2	3	4	5

g.	Honesty is important in handling the school's finance	1	2	3	4	5
h.	Good interpersonal relationship among teachers is important for the effectiveness of teaching and learning	1	2	3	4	5

10. How responsible are you to the country and the community?

Strongly disagree	1	2	3	4	5	Strongly agree

a.	I attend the parent-teacher meetings even as a member	1	2	3	4	5
b.	I always be fair to all of any religion and ethnicity	1	2	3	4	5
c.	I always be fair to all of any family background and status	1	2	3	4	5
d.	I always advice my students to appreciate the public properties	1	2	3	4	5
e.	I always apply the value of loyalty to the nation in teaching and learning process in the classroom	1	2	3	4	5
f.	I emphasize on moral values during teaching and learning activities	1	2	3	4	5

ACCEPTANCE TOWARD TECHNOLOGY USE FOR TEACHING AND LEARNING

Strongly Disagree	1	2	3	4	5	Strongly Agree

11. Awareness and Motivation to Use Technology in Classroom

a.	I am willing to try new method in teaching and learning	1	2	3	4	5
b.	Use of technology in education is not something new to me	1	2	3	4	5
c.	Technology helps to facilitate the teaching and learning process	1	2	3	4	5
d.	Educational technology helps to save time, energy and money	1	2	3	4	5
e.	With the use of technology, students will not feel boring in classroom	1	2	3	4	5
f.	Technology usage helps to entertain and gather interests from students	1	2	3	4	5
g.	With the use of technology, a learning concept can be viewed wholly	1	2	3	4	5

12. Training and Courses on Technology

a.	I know that I am responsible to increase my own knowledge and skills	1	2	3	4	5
b.	I believe that training and courses can help me to increase my performance	1	2	3	4	5
c.	I am confident that training and courses can open new chances in my career prospect	1	2	3	4	5
d.	If I was given a choice, I would choose to undergo trainings for new technological tools	1	2	3	4	5
e.	I am confident that my performance will increase after undergoing any appropriate training	1	2	3	4	5

13. Perceptions on Training Design to Use Technology

a.	The contents of training must relate to my profession as a teacher	1	2	3	4	5
b.	The delivery of training should match my personal needs	1	2	3	4	5
c.	The duration of training must be reasonable to my time and condition at the moment	1	2	3	4	5
d	I have no problem with any method applied to the training	1	2	3	4	5
e.	I prefer trainers who have wider skills and experiences in teaching field	1	2	3	4	5

14. Supports and Facilities

a.	I have many chances to undergo training to increase my credibility as a teacher.	1	2	3	4	5
b.	Other teachers in my school also believe that they will gain other values from training.	1	2	3	4	5
c.	All training and courses I attended have provided us with sufficient physical facilities.	1	2	3	4	5
d	The facilities provided by school helps me to practice new methods I've learnt.	1	2	3	4	5

ACCEPTANCE OF MOBILE TECHNOLOGY
IN TEACHING AND LEARNING PROCESS

15. I find it is easy to use mobile phones.

☐ Yes

☐ No

16. I use mobile phone more frequently for

☐	making calls.
☐	sending sms.

17. I use SMS _____ times daily.

☐	less than 10	☐	31-50
☐	10-30.	☐	more than 50

READINESS FOR M-LEARNING VIA MOBILE PHONE

Strongly Disagree	1	2	3	4	5	Strongly Agree

18.	Mobile phone helps to assist teaching in school.	1	2	3	4	5
19.	Teachers support m-learning outside class time.	1	2	3	4	5
20.	The use of mobile phone for teaching and learning is encouraging.	1	2	3	4	5
21.	Mobile phone helps to interaction easier.	1	2	3	4	5
22.	Mobile phone helps to interact effectively with colleagues and students.	1	2	3	4	5
23.	I believe the future of m-learning in education.	1	2	3	4	5
24.	M-learning will help to learn ubiquitously.	1	2	3	4	5
25.	Believe the benefits of m-learning to future generation.	1	2	3	4	5

a. Listwise deletion based on all variables in the procedure.

APPENDIX B

Table 1. Demographic Profiles

	Frequency	Percentage (%)
Gender		
Male	8	21.1
Female	30	78.9

Age (year)		
25 to 29	10	26.3
30 to 34	8	21.1
35 to 39	5	13.2
40 to 44	7	18.4
45 to 49	4	10.5
50 and above	4	10.5
Ethnic		
Malay	23	60.5
Chinese	12	31.6
Indian	2	5.3
Others	1	2.6
Marital Status		
Single	5	13.2
Married	33	86.8
Qualification		
Masters	3	7.9
Degree	17	44.7
Diploma	14	36.8
STPM*	4	10.5
Year of Service		
5 and less	14	36.8
6 to 10	4	10.5
11 to 15	5	13.2
16 to 20	5	13.2
More than 20	10	26.3

*Note: *STPM equals to Higher School Certificate (HSC) for pre-university program*

APPENDIX C

Table 2. Awareness and Motivation to Use Technology in Classroom

Statement (N=38, Cronbach's Alpha = 0.839, mean = 4.21)	Mean	Std. Deviation	*Total Responses (%)				
			SD	D	NS	A	SA
I am willing to try new method in teaching and learning	4.39	0.547	0	0	2.6	55.3	42.1
Use of technology in education is not something new to me	3.95	0.655	0	0	23.7	57.9	18.4
Technology helps to facilitate the teaching and learning process	4.08	0.587	0	0	13.2	65.8	21.1
Educational technology helps to save time, energy and money	4.08	0.539	0	0	10.5	71.1	18.4
With the use of technology, students will not feel boring in classroom	4.37	0.589	0	0	5.3	52.6	42.1
Technology usage helps to entertain and gather interests from students	4.39	0.547	0	0	2.6	55.3	42.1
With the use of technology, a learning concept can be viewed wholly	4.21	0.528	0	0	5.3	68.4	26.3

Note: *The total responses in percent were determined by using a five-point Likert Scale rating from strongly disagree (1) to strongly agree (5)

APPENDIX D

Table 3. Willingness to Attend Training and Courses on Technology

Statement (N=38, Cronbach's Alpha = 0.846,	Mean	Std.	*Total Responses (%)

mean = 4.35)		Deviation	SD	D	NS	A	SA
I know that I am responsible to increase my own knowledge and skills	4.53	0.603	0	0	5.3	36.8	57.9
I believe that training and courses can help me to increase my performance	4.42	0.642	0	0	7.9	42.1	50.0
I am confident that training and courses can open new chances in my career prospect	4.18	1.036	5.3	0	13.2	34.2	47.4
If I was given a choice, I would choose to undergo trainings for new technological tools	4.32	0.739	0	0	15.8	36.8	47.4
I am confident that my performance will increase after undergoing any appropriate training	4.29	0.694	0	0	13.2	44.7	42.1

Note: *The total responses in percent were determined by using a five-point Likert Scale rating from strongly disagree (1) to strongly agree (5)

APPENDIX E

Table 4. Perceptions on Training Design to use Technology

Statement (N=38, Cronbach's Alpha = 0.748, mean = 4.17)	Mean	Std. Deviation	*Total Responses (%)				
			SD	D	NS	A	SA
The contents of training must relate to my profession as a teacher	4.42	0.642	0	0	7.9	42.1	50.0
The delivery of training should match my personal needs	4.08	0.850	2.6	0	15.8	50.0	31.6
The duration of training must be reasonable to my time and condition at the moment	4.08	0.712	0	0	21.1	50.0	28.9
I have no problem with any method applied to the training	4.11	0.689	0	0	18.4	52.6	28.9
I prefer trainers who have wider skills and experiences in teaching field	4.18	0.652	0	0	13.2	55.3	31.6

Note: *The total responses in percent were determined by using a five-point Likert Scale rating from strongly disagree (1) to strongly agree (5)

APPENDIX F

Table 5. Supports and Facilities

Statement (N=38, Cronbach's Alpha = 0.876, mean = 4.05)	Mean	Std. Deviation	*Total Responses (%)				
			SD	D	NS	A	SA
I have many chances to undergo training to increase my credibility as a teacher	4.00	0.697	0	2.6	15.8	60.5	21.1
Other teachers in my school also believe that they will gain other values from training	4.05	0.655	0	0	18.4	57.9	23.7
All training and courses I attended have provided us with sufficient physical facilities	3.97	0.677	0	0	23.7	55.3	21.1
The facilities provided by school helps me to practice new methods I've learnt	4.18	0.563	0	0	7.9	65.8	26.3

Note: *The total responses in percent were determined by using a five-point Likert Scale rating from strongly disagree (1) to strongly agree (5)

APPENDIX G

Table 6. Teachers' Readiness for M-Learning via Mobile Phone

Statement (N=37, Cronbach's Alpha = 0.876)	Mean	Std. Deviation	*Total Responses (%)				
			SD	D	NS	A	SA
Mobile phone helps to assist teaching in school	2.16	1.191	39.5	18.4	31.6	5.3	5.3
Teachers support m-learning outside class time	2.57	1.237	31.6	5.3	39.5	21.1	2.6
The use of mobile phone for teaching and learning is encouraging	2.32	1.180	31.6	23.7	26.3	15.8	2.6
Mobile phone helps to interaction easier	3.57	1.214	10.5	5.3	21.1	42.1	21.1
Mobile phone helps to interact effectively with colleagues and students	3.27	1.283	13.2	10.5	28.9	28.9	18.4
Believe the future of m-learning in education	2.92	1.362	21.1	15.8	26.3	23.7	13.2
M-learning will help to learn ubiquitously	3.03	1.190	10.5	23.7	26.3	28.9	10.5
Believe the benefits of m-learning to future generation	2.84	1.118	13.2	23.7	31.6	26.3	5.3

Note: *The total responses in percent were determined by using a five-point Likert Scale rating from strongly disagree (1) to strongly agree (5)

APPENDIX H

Table 7. Teachers' Readiness for M-Learning via Mobile Phone

Demographic Factors	Categories	χ^2	*p*	Mobile phone helps to assist teaching in schools (%)				
				SD	D	N	A	SA
Gender	Male	11.025*	0.026	25.0	0	37.5	12.5	25.0
	Female			43.3	23.3	30.0	3.3	0
Age	25 to 29	18.954	0.525	30.0	0	50.0	10.0	10.0
	30 to 34			50.0	25.0	12.5	0	12.5
	35 to 39			20.0	20.0	40.0	20.0	0
	40 to 44			28.6	14.3	57.1	0	0
	45 to 49			75.0	25.0	0	0	0
	50 and above			50.0	50.0	0	0	0
Ethnicity	Malay	19.554	0.076	39.1	8.7	39.1	8.7	4.3
	Chinese			50.0	33.3	16.7	0	0
	Indian			0	0	50	0	50
	Others			0	100	0	0	0
Marital	Single	2.931	0.569	40.0	20.0	20.0	0	0
	Married			39.4	18.2	33.3	6.1	3
Qualification	Masters	12.618	0.397	0	33.3	66.7	0	0
	Degree			35.3	5.9	41.2	5.9	11.8
	Diploma			25.0	50.0	25.0	0	0
	STPM			39.5	18.4	31.6	5.3	5.3
Years of Service	5 and less	18.117	0.317	28.6	14.3	35.7	7.1	14.3
	6 to 10			50.0	0	50.0	0	0
	11 to 15			40.0	20.0	40.0	0	0
	16 to 20			0	20.0	60.0	20.0	0
	More than 20			70.0	30.0	0	0	0

Note: *Relationship is significant at the 0.05 level (2-tailed)

APPENDIX I

Table 8. Crosstabulation of Demographic Factors and "Mobile phone helps to assist teaching in schools"

Demographic Factors	Categories	χ^2	*p*	The use of mobile phone for teaching and learning is encouraging (%)				
				SD	D	N	A	SA
Gender	Male	14.535*	0.006	25.0	0	12.5	50.0	12.5
	Female			33.3	30.0	30.0	6.7	0
Age	25 to 29	25.094	0.198	30.0	10.0	20.0	40.0	0
	30 to 34			37.5	37.5	0	12.5	12.5
	35 to 39			0	40.0	40.0	20.0	0
	40 to 44			28.6	28.6	42.9	0	0
	45 to 49			25.0	0	75.0	0	0
	50 and above			75.0	25.0	0	0	0
Ethnic	Malay	11.495	0.487	26.1	26.1	21.7	21.7	4.3
	Chinese			50.0	16.7	33.3	0	0
	Indian			0	0	50.0	50.0	0
	Others			0	100	0	0	0
Marital	Single	0.466	0.977	40.0	20.0	20.0	0	0
	Married			30.3	24.2	27.3	15.2	3.0
Qualification	Masters	6.730	0.875	33.3	0	66.7	0	0
	Degree			29.4	23.5	17.6	23.5	5.9
	Diploma			28.6	28.6	28.6	14.3	0
	STPM			50.0	25.0	25.0	0	0
Years of Service	5 and less	22.744	0.121	35.7	214.3	14.3	28.6	7.1
	6 to 10			25.0	25.0	25.0	25.0	25.0
	11 to 15			0	80.0	20.0	0	0
	16 to 20			0	20.0	60.0	20.0	0
	More than 20			60.0	10.0	30.0	0	0

Note: *Relationship is significant at the 0.05 level (2-tailed)

APPENDIX J

Table 9. Crosstabulation of Demographic Factors and "The use of mobile phone for teaching and learning is encouraging"

	Mean	Std. Dev	Skew-ness	Kur-tosis	Awareness and Motivation	Training and Courses	Training Design	Supports and Facilities	M-Learning Readiness
Awareness and motivation	4.21	0.408	0.294	-0.001	1				
Training and courses	4.35	0.597	-0.523	-0.812	0.628**	1			
Training Design	4.17	0.503	-0.101	-0.320	0.351*	0.330*	1		
Supports and facilities	4.05	0.555	0.471	-0.327	0.423**	0.457**	0.271	1	
M-Learning readiness	2.85	0.970	0.037	-0.553	0.508**	0.299	-0.126	0.126	1

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

APPENDIX K

Table 10. Correlations between Teachers' Technology Acceptance and Their M-Learning Readiness

	Mean	Std. Dev	Skew-ness	Kur-tosis	Awareness and Motivation	Training and Courses	Training Design	Supports and Facilities	M-Learning Readiness
Awareness and motivation	4.21	0.408	0.294	-0.001	1				
Training and courses	4.35	0.597	-0.523	-0.812	0.628**	1			
Training Design	4.17	0.503	-0.101	-0.320	0.351*	0.330*	1		
Supports and facilities	4.05	0.555	0.471	-0.327	0.423**	0.457**	0.271	1	
M-Learning readiness	2.85	0.970	0.037	-0.553	0.508**	0.299	-0.126	0.126	1

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

APPENDIX L

Scale: Technology Acceptance

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.894	.905	21

Scale: M-learning Readiness

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.928	.929	11

Figure 1. Ease of using mobile phone

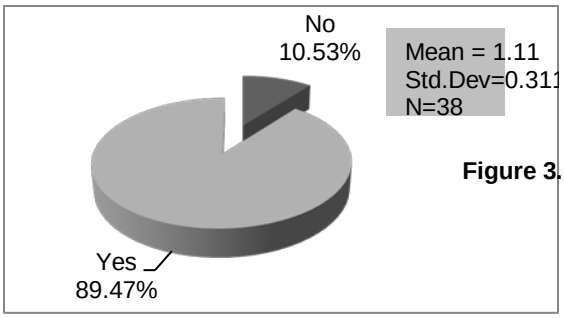

Figure 2. Most frequently used application

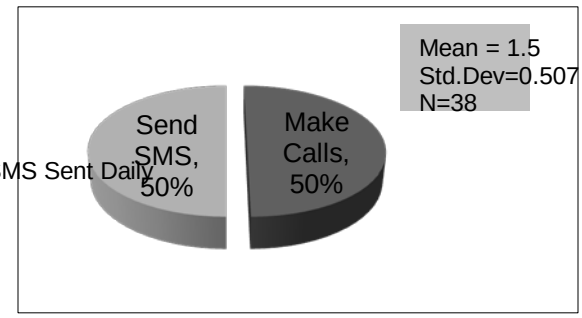

Figure 3. Total SMS Sent Daily

Figure 3. Use percentages.