

# Assessing Mobile Learning Readiness in Saudi Arabia Higher Education: An Empirical Study

Nada Mansour F Aljuaid [1], Mohammed Ali Rajab Alzahrani [2], A.Y.M. Atiquil Islam [3]

- [1] Faculty of Education, Universiti Teknologi Malaysia
- [2] Faculty of Computing, Universiti Teknologi Malaysia
- [3] Institute of Graduate Studies, University of Malaya

Corresponding email: skyum2013@gmail.com

#### **ABSTRACT**

Mobile learning has been introduced for quite some time now at Taif University. However, there is no research conducted to measure the readiness of mobile learning within its context. As such, the aim of this study is to assess the lecturers' readiness for mobile learning in higher education in terms of perceived usefulness and perceived ease of use. A total of 140 lecturers were collected from the faculty of education using online survey. A five-point Likert scale that demonstrated degrees of agreement (from strongly disagree to strongly agree) was applied to capture the lecturers' perceptions on their readiness for mobile learning. The instrument validity was conducted using factor analysis. A multiple regression model demonstrated that all predictors accounted for 60.9% of the variation. The findings showed that perceived ease of use and perceived usefulness are the valid predictors of assessing lecturers' readiness for mobile learning in higher education. Therefore, it was concluded that perceived usefulness and perceived ease of use have a significant impact on readiness for mobile learning.

Keywords:

mobile learning readiness, factor analysis, multiple regression analysis, higher education.

#### **INTRODUCTION**

Mobile learning is considered as learning procedures held outside of the traditional classroom and through learning device (computers, tablets, iPads, palm tops, and mobile phones); people keep continuing their learning activities. However, there is presently no ultimate definition of mobile learning (Crompton, 2013). Mobile learning is the juncture of mobile computing: people get information, while remaining anywhere at anytime. Mobile learning has strong search capabilities and rich interactions. For effective learning, it provides a powerful support. Mobile learning is frequently linked to the utilization of mobile technology particularly in the mobile phone (Cavus, Bicen & Akçil, 2008; Naismith, Lonsdale, Vavoula, & Sharples, 2004). Mobile learning is important for this rapidly advancing technological era. Through this learning system, learners receive information and educational opportunities within a few minutes since it decreases physical distance. People who live in rural areas and far from campus are deprived of permanent line telecom infrastructures but they can have mobile device (WiFi) to acquire educational opportunities. Nowadays, to complete the educational process, Higher Educational Institutions are using Mobile learning systems.

Caudil (2007) in his research identified two elements for making Mobile learning plausible and easier for learners. These are: 1) advances in both mobile digital technology and wireless networks; 2) technological advances making mobile devices more available and affordable to the average person.



Among distance learning tools, mobile learning cherishes a greater duty for online community through texting. Hence, texting is used in online discussions, file transfer, access to academic library support, and more (Kadirire, 2007). Moreover, some barriers of mobile learning need to be comprehended for successful implementation. The potential barriers are cost, technology, access, usability, course design, and lack of acceptance. According to Lawrence, Bachfischer, Dyson, and Litchfield (2008), students' cost barriers are the cost of mobile devices and communications to access. For a successful implementation, it is important to monitor and evaluate mobile initiatives effectually (Aderinoye, Ojokheta & Olojede, 2007).

Students complain on some negative issues in mobile learning service because of small screens, limitation to access web-based materials and slow downloading. Web pages are not every time planned for small screens (Bryan, 2004; Lawrence et al., 2008). Lawrence et al. (2008) and Naismith et al. (2004) claimed that in spite of widespread adult and teen acceptance of mobile devices and cell phones, faculty and support staff acceptance of mobile learning in public universities, colleges, schools and academic libraries is still low and the determinants of acceptance are unclear.

Above all, despite having some barriers, mobile learning is important and essential to disseminate knowledge among learners. Mclean (2003) stated, "Mobile learning has surfaced like a new trend of development, in line with the utilization of mobile phones merged with wireless facilities and infrastructure, and much of the current literature on mobile learning shows all the strengths and weaknesses linked to the more mature e-learning communities". Recently, the Kingdom of Saudi Arabia is reported as the country with the highest percentage of mobile phone users in the whole world (Seliaman & Al-Turky, 2012). Literature regarding the level of readiness and perceptions of lecturers in accepting mobile learning in higher education are reviewed in the next section.

### **Lecturers' Readiness for Mobile Learning**

According to West (2012), for the first time in history a majority of teachers, whether in developing or developed countries, have individual access to influential communications technology, and this opens up stimulating educational prospects. Mobile phones may be used for teacher and educator professional development. Furthermore, West (2012) cited that teachers are vital in order to assemble an educational process that embraces mobile learning, which is required to effectively teach educators as well as recruit their own support. Hence, educators play an important role in promoting quality education through mobile technology (Attawel, 2005; Daniel, 2008; Ferry, 2009). In other words, according to Yusof, Daniel, Low, and Aziz (2011), for adopting and implementing mobile learning, teachers' willingness and preparedness are a critical success factor. According to Ferry (2009), they must need to establish a dissimilar and innovative set of skills and knowledge for applying this technology in their classrooms. Mobile learning can facilitate improved interaction among teachers, administrators and students.

In Cyprus, Uzunboylu and Ozdamli (2011) conducted a study on teachers' perception for mobile learning, and found that teachers showed above moderate levels of awareness of mobile learning. Kafyulilo (2012) conducted a study in Tanzania to explore the access, practice and insights of teachers and students toward mobile phones as a device for facilitating teaching and learning beyond the classroom. From the findings, it is seen that all pre-service and in- service teachers, college instructors and students owned mobile phones.

A recent research by Serin (2012) showed that prospective teachers' (teachers at a university in Turkish Republic of Northern Cyprus) mobile learning perception levels were low. The author also found misconception of the prospective teachers who claimed to have knowledge regarding mobile learning and also their wrong insight that effective communication environment will be continued by using mobile learning. It was determined that prospective teachers' mobile learning perception



does not differ significantly (Serin, 2012).

Yusof et al. (2011) investigated teachers' insight on mobile learning application in typical education classes and the benefits and challenges of applying combined learning for special education. The findings of this research indicate that teachers used different teaching strategies to meet different students' requirements. And teachers possess imperfect knowledge in integrating mobile learning technologies in their teaching and they have inadequate resources of equipment. Consequently, Yusof et al. (2011) claimed, "Suitability can be discovered through teachers' understanding of the mobile devices as well as whether or not they possess the abilities to make use the mobile devices like a tool for teaching". According to Buckenmayer (2008) and Ferry (2009), to adopt mobile technologies as an added value on the educators' existing teaching, readiness should be considered and studied in learning environment.

Mobile learning and teaching systems help teachers to capture and analyze students' learning performance. To examine the preferences and intention of educators to implement mobile learning in higher education, Zulkafly, Koo, and Shariman (2011) conducted a study in Multimedia University in Malaysia. The investigators observed that Multimedia University is one of the adopters of mobile learning. Consequently, the educators preferred to use mobile devices for managing learning activities such as taking attendance, delivering announcement and scheduling class events and assessment activities (Zulkafly et al., 2011). However, Ferry (2009) viewed that educators had lower proficiency of mobile learning than the students in terms of using technology.

In France, Cruz, Assar and Boughzala (2012) investigated the usage and acceptance of mobile technologies by instructors in a business school. Fourteen teachers in a business school participated in this qualitative research. They comprehended that to organize mobile materials, to include relevant information, to inspire replication, and to generate communicating activities with timely response in mobile environment, current teaching practices should be changed. Furthermore, the authors claimed that they identified technological, institutional, pedagogical and individual obstacles that threaten Mobile learning practices. Educator readiness is based on how educators perceive the mobile technology as a new medium for their teaching and learning (Zulkafly et al., 2011).

In the United Kingdom, Wishart (2009) conducted a study on the use of Mobile Technology for teacher training. This study aimed at constructing mobile learning and mobile teaching aptitude, to facilitate school based associate teachers to join the e-learning municipal interrelated to the indigenous initial teacher preparation course, and to inspire reflective training among trainee teachers. It found that for accessing course information, teachers did not utilize their handhelds. Mobile learning using mobile device is still incomprehensible to the teachers and remains in an initial stage to them. This is due to limited research on educators' concerns and preferences of utilizing the innovative mobile technologies in their teaching and learning (Ferry, 2009; Litchfield, Dyson, Lawrence, & Zmijewska, 2007). In so doing, the objective of this study is to assess the lecturers' readiness of mobile learning in Saudi Arabian higher education terms of perceived usefulness and perceived ease of use. The present study applied the Technology Acceptance Model (TAM) to evaluate the lecturers' readiness for mobile learning as explained in the next section.

## **Technology Acceptance Model (TAM)**

To measure the perceived usefulness and ease-of-use among technology handlers, Davis (1989) developed the Technology Acceptance Model (TAM). Huang (2005) stated that the goal of Davis's classic TAM is to explain individuals' use of a specific system under organizational settings. Tsai and Su (2007) argued that the TAM has become an important research model for assessing the factors of information technology acceptance and utilization among users and it was the most adopted model. Similarly, Raaij and Schepers (2008) cited that TAM is a widely used theory among several models in the information system literature to explain individuals' acceptance of



information technology. According to Davis (1989), when consumers are ready with a new software package, TAM suggests them that numerous numbers of factors influence their decision regarding the process and the time of using it. Bagozzi, Davis, and Warshaw (1992) stated that TAM predicts an individual forms an intention to act, and that the individual will be free to act without constraint; though, in the real world, there will be several limitations, such as limited abilities, time constraints, organizational or environmental limits, or unconscious habits, which limit the freedom to act.

Action (TRA) is the Davis' (1989) Technology Acceptance Model which identified two dogmas, such as perceived usefulness (PU) and the perceived ease of use (PEU) respectively. Davis (1989, p. 320) explained PU as "The degree to which a person believes that using a particular system would enhance his or her job performance". Furthermore, he also delineated PEU as "the degree to which a person believes that using a particular system would be free of effort". Indeed, a substantial figure of TAM research has displayed that perceived usefulness is a robust factor of consumer reception, implementation, and practice behavior (Venkatesh, Morris, Davis, & Davis, 2003) wherein individual professional users may differ from other technology users in terms of acceptance (Chau & Hu, 2002).

Allport (1935) indicated, "An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (p. 810). Davis, Bagozzi, and Warshaw (1989) recommended that usefulness and ease of use calculate system practice through the intermediating variables of attitude and intention. The direct influence of perceived ease of use and perceived usefulness on attitude and again these perceived ease of use and perceived usefulness have also influenced the intention to use and use indirectly mediated by them as indicated in Figure 1.

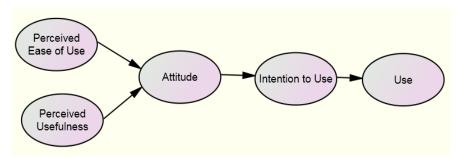


Figure 1. Technology Acceptance Model (TAM) (Source: Islam, 2011b)

A study by Mayorga (2010) using the established TAM foundation verified the significant role played by the perception of usefulness and ease of use on attitude. According to Robey (1979) the work environment and organization attitudes can ensure an important encouragement on an individual's perception. This experimental and hypothetically determined TAM exploration is advantageous to the assessment of various professional manipulators because it openly explains the importance of definite theoretical variables assessed. The overall research goals were achieved, as the research objectives were to clearly identify pertinent "change agents" that can assist management and academia in fostering a culture of technology acceptance and usage (Mayorga, 2010).

Some researchers hold that technology acceptance is more complicated than initially thought, and have scrutinized other variables that stimulate acceptance (Taylor & Todd, 1995; Thompson, Compeau, & Higgins, 2006). According to Thompson et al. (2006), TAM has two paramount and prominent themes which are parsimony and instrumental determinants. The slimness of the model is also measured as its fundamental restriction, while the ungenerousness of TAM makes it relaxed to relate to a variety of conditions (Shen, Hiltz & Bieber, 2009). Again, Thompson et al. (2006) argued that although these major premises have provided the technology



acceptance stream well, perceived ease of use and perceived usefulness are not the only valid determinants related to technology adoption, particularly with newer technologies.

In addition, many researchers have extended TAM by incorporating new constructs into the model (Ahmad, Basha, Marzuki, Hisham & Sahari, 2010; Islam, 2011a, 2011b; Hanafizadeh, Behboudi, Koshksaray & Tabar, 2012; Shittu, Basha, Rahman & Ahmad, 2011, 2013). On the other hand, some studies were conducted after dropping a few factors from the original TAM (Wang, Lin & Luarn, 2006; Zejno & Islam, 2012). As a result, this study has modified the Technology Acceptance Model by dropping attitude and use to assess the lecturers' readiness of mobile learning in higher education where readiness is treated to be similar to intention to use as shown in Figure 2.

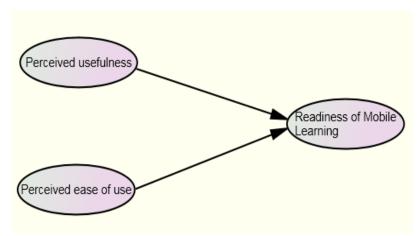


Figure 2. The Hypothesized Mobile Learning Readiness Model.

## Perceived Usefulness (PU) - Readiness of Mobile learning (Intention to Use)

Perceived usefulness is a system and it is the belief of the users that if they use this specific system their job performance would be enriched. Davis (1989) found from his study that perceived usefulness was the magnitude to which the consumer considers that consuming a specific method would enrich his or her job performance. A study by Kim (2009) aimed at exploring the influencial factors of customers in accepting biometrics and to moderate impacts of demograpic factors on their intention to use biometrics.

Gibson and Harris (2008) conducted a survey aimed at assessing the degree to which the TAM was competent to satisfactorily elucidate faculty acceptance of online education. The result indicated that perceived usefulness is a robust pointer of faculty acceptance; nevertheless, perceived ease of use deals little additional projecting power beyond that contributed by perceived usefulness (PU) of online education technology. Barkhi, Belanger and Hicks (2008) claimed, "TAM postulates that perceived usefulness is an important determinant of user attitude about acceptance of technologies that can lead to the intention to use the technology and actual usage." Furthermore, Shen et al. (2009) stated, "Emphasis should be placed on increasing the perceived usefulness of virtual worlds for education, which is possible through the creation of effective course content".

In Hong Kong, Chau and Hu (2002) conducted a survey in the public hospitals involving more than 400 doctors. The results of the study found that the individual professionals such as physicians' anchorperson their usage decision based on the usefulness of the technology rather than in its ease of use. The study concluded that to the physicians' acceptance of telemedicine technology, perceived usefulness was the most significant determinants. The results also confirmed prior TAM research findings that perceived usefulness was a more important predictor of intended system usage than perceived ease of use (Davis, 1989). Moreover, several studies discovered that perceived usefulness had a statistically significant influence on intention to use (Islam, 2011a; Lee, Hsieh & Hsu, 2011; Torres, Marín, García, Vázquez, Oliva & Torres, 2008; Venkatesh & Morris, 2000). Similarly, Wang et al. (2006) revealed that perceived usefulness had a significant effect on



behavioral intention in using mobile service. It is thus hypothesized that:

H1: Perceived usefulness will have impact on readiness of mobile learning.

# Perceived Ease of Use (PEU) -Readiness of Mobile learning (Intention to Use)

Perceived ease of use is defined as "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis, 1993). In the existing literature, several studies have demonstrated a significant effect of perceived ease of use on intention to use (Ong, Lai & Wang, 2004; Venkatesh, 2000; Wang, et al., 2006; Yoon & Kim, 2007). However, Online Database Adoption and Satisfaction Model indicated that perceived ease of use had a significant direct effect on intention, but in an adverse direction (Islam, 2011a). In other related studies, Chang, Yan and Tseng (2012) found that perceived ease of use did not exert any significant direct influence on intention to use mobile technology for English learning. It is thus hypothesized that:

H2: Perceived ease of use will have impact on readiness of mobile learning.

#### **METHODOLOGY**

The participants for this study included lecturers at faculty of education selected using purposive sampling procedure. A total of 186 lecturers were therefore taken as the sampling frame; out of this, 140 lecturers successfully completed online surveys. The sample size was considered adequate for application of factor analysis and Multiple Regression Analysis (MRA) as supported by the prior studies done by Hair, Black, Babin and Anderson (2010). Data analysis was performed using SPSS version 16.0. Various demographic attributes of the respondents were highlighted through descriptive analyses. The sample comprised of 52% male and 48% female. The majority of lecturers (32%) were between 35 to 40 years of age. Most of the lecturers (32%) had between 2 to 3 years of teaching experience whereas only 13% lecturers had more than 8 years of teaching experience. The sample consisted of lecturers having different levels of educational background such as Bachelor, Master and PhD, with 70% lecturers overall holding Master and PhD degrees. With regard to department, the majority of (32%) of surveyed lecturers were working at the Curriculum and Educational Technology department, followed by Educational Sciences and Special Education, 16% and 10%, respectively.

#### **Research Instrument**

A questionnaire containing items that assess three factors of interest, namely, perceived usefulness, perceived ease of use, and readiness of mobile learning for lecturers which was developed and modified based on prior study done by Islam (2011a, 2011b) was constructed to suit this particular study. The first section described the demographic information and second to fourth sections consisted of items. A five-point Likert scale that demonstrated degrees of agreement (from strongly disagree to strongly agree) was applied to capture the lecturers' perceptions about their readiness for mobile learning. The number of factors and items were measured for lecturers as indicated in Table 1.



Table 1. The number of Factors and Items Measured

	Factors Measured	Number of Items		
	Perceived Ease of Use (Islam, 2011a; 2011b)	10		
Lecturers	Perceived Usefulness (Islam, 2011a; 2011b)	10		
	Intention to use	8		
	(Islam, 2011a)			
	Total	28		

## **Reliability and Validity of Instrument**

The instruments' reliability and validity were conducted by using SPSS. A set of 3 reliability analyses were executed on the responses that evaluated each construct for lecturers. Similarly, the instruments' validity was performed using factor analysis. The reliability values for the factors achieved in the study were discovered to be congruent with previous study done by Islam (2011a; 2011b). A synopsis of the reliability for all factors is exhibited in Table 2.

Table 2. Cronbach's Alpha for Each Factor Measured

Respondents	Factors	Cronbach's Alpha Values		
	Perceived Ease of Use	.855		
Lecturers	Perceived Usefulness	.921		
Lecturers	Intention to use	.950		

The purpose of the factor analysis is to develop and validate the psychometric properties to examine the mobile learning readiness in Saudi Arabian higher education as well as to identify the underlying factors which influence lecturers in using mobile learning for their teaching and learning. The preliminary factor analysis was estimated with 28 items of perceived ease of use, usefulness and readiness to assess the underlying factors of mobile learning. However, the analyses discovered four underlying factors and few items had cross loadings which were contradicting with the hypothesized model. As a result, the researchers decided to drop the items due to validate and estimate the instrument and model as well. After deleting the items, the results of factor analysis demonstrated that the extent of inter-correlation among the variables is statistically significant.

There was no correlation greater than .80 which exhibited that the items were free from multi-collinearity. Similarly, the inter-correlation among the items justified the beginning of factor analyses as demonstrated by anti-image matrices where all variables showed more than .50 correlations between them. The Kaiser-Meyer-Olkin assess of sampling adequacy was .905, showing the suitability of the data for factor analyses.

In the meantime, Bartlett's Test of Sphericity was found to be statistically significant (p = .000), which was identifying the adequate correlation between the variables. Moreover, the three-factor elucidation achieved from the factor analyses with varimax rotation after dropping few items (PU5, PU6, PEU1, PEU3, PEU8, PEU9, and PEU10), the total variance explained by the measures was 69.802% which depicted that the items were competent to endorse the lecturers' readiness of mobile learning. Besides, the greater Eigen value was achieved on the first component of 11.426, while the other two components discovered values of 2.175 and 1.057, respectively. Communalities estimates for each of the variables were greater than .533.

The rotated component matrix revealed three valid factors, namely, readiness (INT), perceived usefulness (PU) and perceived ease of use (PEU). The first component, readiness represented by the eight items recognized loadings ranging from .705 to .853, demonstrated statistically significant variables and explained 54.412% of the total variance. The second



component, perceived usefulness characterized by the eight items indicated loadings from .624 to .823 and explained 10.355% of the total variance. Eventually, the third component, perceived ease of use comprised of the five items revealed loadings from .468 to .717 and explained 5.035% of the total variance as shown in Table 3.

Table 3. The list of Valid Items

Item No	Item Descriptions	Loadings	М	SD	α	Extracted variance
PEU2	I find it easy to access the Mobile learning at my university	.717	3.562	1.182		
PEU4	It is easy for me to search educational materials using the Mobile learning	.629	3.876	.996		
PEU5	Interacting with the Mobile learning system requires minimal mental effort	.623	3.710	1.036		
PEU6	It is easy for me to give consultation to students using Mobile learning	.468	3.851	1.013		0.582
PEU7	I find it easy to interact with students using Mobile learning	.475	3.909	.991	0.855	
PU1	Using Mobile learning enables me to download the teaching materials	.814	3.840	1.049		
PU2	Using Mobile learning helps me to upload learning material	.823	3.848	1.005		
PU3	Mobile learning allows me to evaluate students performance	.650	3.697	.970		
PU4	My interaction with students would be difficult without Mobile learning	.671	3.521	1.072		
PU7	Using the Mobile learning improves the quality of my work	.625	3.806	1.051	0.921	
PU8	Using the Mobile learning allows me to check the exam results	.682	3.873	1.062		0.705
PU9	Using the Mobile learning increases my academic productivity	.624	3.958	1.028		0.703
PU10	Using the Mobile learning allows to access databases	.754	3.848	1.038		
INT1	I intend to use Mobile learning	.791	4.100	1.020		
INT2	I will use the Mobile learning to carry out my teaching	.853	4.016	.991		
INT3	I intend to use Mobile learning frequently	.750	3.941	1.027		
INT4	I will use Mobile learning to get the updated information related to my teaching areas	.784	4.058	.968		
INT5	I intend to use Mobile learning to accomplish my academic works	.800	3.983	1.073		
INT6	I would prefer to adopt in using Mobile learning environment to teach students	.838	3.983	.999		
INT7	I intend to do research works using Mobile learning environment	.725	3.958	.986	OEO	0.700
INT8	Using Mobile learning will enhance interaction with my students to solve their academic problems	.705	4.100	.994	.950	0.780



#### **RESULTS**

The hypothesized mobile learning readiness model was tested using a multiple regression model to validate the hypotheses. The findings showed that all predictors accounted 60.9% of the variation (F =88.783, p <.000), thus the model was statistically significant. The results also indicated that perceived usefulness ( $\beta$  = .598, p < .000, t = 6.496) and perceived ease of use ( $\beta$  = .430, p < .004, t = 2.931) were significant valid predictors of lecturers' readiness of mobile learning in Saudi Arabia higher education as shown in Table 4. Moreover, the regression model was free from multicollinearity. Therefore, it was concluded that H1 and H2 were accepted to have a significant impact on readiness of mobile learning.

Table 4. Regression: Readiness of Mobile learning

Model		Unstandardized Coefficients		Standardiz ed Coefficient s	t	Sig.	Correlations			Collinearity Statistics	
		В	Std. Error	Beta			Zero- order	Partia I	Part	Toleranc e	VIF
1	(Constant)	5.856	2.025		2.892	.005					
	PEU	.430	.147	.257	2.931	.004	.681	.265	.172	.446	2.244
	PU	.598	.092	.570	6.496	.000	.761	.520	.380	.446	2.244

#### DISCUSSION

The results of this study show that the Technology Acceptance Model (TAM) was found to be applicable to measure the lecturers' readiness for mobile learning. A multiple regression analysis was conducted to assess the hypothesized mobile learning readiness model in validating the hypotheses. Firstly, the hypothesis that perceived usefulness found to have a statistically significant impact on lecturers' readiness (intention to use) of mobile learning in higher education. It was also demonstrated to be the most significant valid predictor of mobile learning readiness. The finding was consistent with previous studies (Islam, 2011a; Lee, Hsieh & Hsu, 2011; Torres, Marín, García, Vázquez, Oliva & Torres, 2008; Venkatesh & Morris, 2000; Wang et al., 2006). However, Davis (1989) revealed that perceived usefulness had a significant indirect influence on intention to use mediated by attitude. Therefore, it is recommended that lecturers may enhance their readiness or intention to use mobile learning in higher education by emphasizing its usefulness.

Finally, perceived ease of use showed a statistically significant impact on readiness (intention to use) of mobile learning, thereby validating the hypothesis. This was congruent with prior studies (Ong, Lai & Wang, 2004; Venkatesh, 2000; Wang et al., 2006; Yoon & Kim, 2007). Nevertheless, Chang et al. (2012) demonstrated that perceived ease of use did not exert any significant direct influence on intention to use mobile technology for English learning. Similarly, Islam (2011a) depicted that perceived ease of use had a negative influence on intention to use an online database.

As proved from the factor analysis, the perception of mobile learning readiness revealed that lecturers have intention to use mobile learning to carry out their teaching, and getting the updated information related to teaching. Similarly, lecturers also showed the intention to use mobile learning to accomplish their academic and research works and adopt the mobile learning environment to teach and interact with students to solve their academic problems. Thus, the findings suggested that lecturers are ready to use mobile learning in higher education.

Regarding the lecturers' views on perceived usefulness of mobile learning, it was marked in lecturers enabling to download the teaching materials, uploading learning materials, evaluating



students' performances and results, increasing academic productivity and accessing the database in using mobile learning.

Concerning the perceived ease of use of mobile learning, it was found to be ease of use in terms of lecturers' accessibility of mobile learning at the university, easy to search educational materials, minimal mental effort, consultation and interaction with students using mobile learning.

#### **CONCLUSION**

The hypothesized mobile learning readiness model exhibited that lecturers are ready to use mobile learning in terms of usefulness and ease of use for their teaching and learning in Saudi Arabian higher education. Moreover, the findings show that perceived usefulness and perceived ease of use were significant predictors of mobile learning readiness. However, Serin (2012) showed that prospective teachers' mobile learning perception levels were low. Along this line, Ferry (2009) found lower proficiency of educators than the students in terms of using technology. Besides, Mobile learning using mobile device is still incomprehensible to the teachers and remains in an initial stage to them. This is due to limited research on educators' concerns and preferences of utilizing the innovative mobile technologies in their teaching and learning (Ferry, 2009; Litchfield, Dyson, Lawrence & Zmijewska, 2007). This study discovered that lecturers showed better understanding of mobile learning and its benefit in higher education for teaching and learning purposes.

#### **RECOMMENDATION**

The present study was limited among the lecturers of the faculty of education at Taif University. It was conducted through a survey questionnaire and therefore no qualitative perspective has been taken into account. Under the circumstances, this study suggested that future researchers should include lecturers from other faculties as well as universities in Saudi Arabia that would be more inclusive in nature. Moreover, further researches could be conducted by incorporating new constructs into the original TAM and collecting a large sample size to measure the readiness of mobile learning in the different parts of the world.

# **REFERENCES**

Aderinoye, R. A., Ojokheta, K. O., & Olojede, A. A. (2007). Integrating mobile learning into nomadic education programmes in Nigeria: Issues and perspectives. *International Review of Research in Open and Distance*Learning,
8(2).

Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/347/919

Ahmad, T. B. T., Basha, K. M., Marzuki, A. M., Hisham, N. A., & Sahari, M. (2010). Faculty's acceptance of computer-based technology: cross-validation of an extended model. *Australian Journal of Educational Technology*, 26(2), 268-279.

Allport, G. W. (1935). Attitudes. In C. M. Murchison (Ed.), *Handbook of Social Psychology.* Worcester, MA: Clark University Press.

Alzaza, N. S. (2012). Opportunities for utilizing mobile learning services in the Palestinian higher education. *International Arab Journal of e-Technology*, 2(4), 216-222.

Attewell, J. (2005). Mobile technologies and learning: A technology update and m-learning project summary, Argyll Street, London, Learning and Skills Development Agency. Retrieved from <a href="http://www.m-learning.org/docs/The%20m-learning%20project%20-%20technology%20update%20and%20project%20summary.pdf">http://www.m-learning.org/docs/The%20m-learning%20project%20summary.pdf</a>



- Bagozzi, R., Davis, F., & Warshaw, P. (1992). Development and test of a theory of technological learning and usage. *Human Relations*, 45(7), 660-686.
- Barkhi R., Belanger F., & Hicks, J. (2008). A model of the determinants of purchasing from virtual stores. *Journal of Organizational Computing and Electronic Commerce*, *18*(3), 177-196.
- Bryan, A. (2004). Going nomadic: Mobile learning in higher education. *Educause Review, 39*(5), 28-35. Retrieved from <a href="http://www.educause.edu/ero/article/going-nomadic-mobile-learning-higher-education">http://www.educause.edu/ero/article/going-nomadic-mobile-learning-higher-education</a>
- Buckenmayer, J. (2008). Revisiting teacher adoption of technology: Research implications and recommendations for successful full technology integration. *College Teaching Methods & Styles Journal*, 4(6), 7-10.
- Caudill, J. G. (2007). The growth of m-Learning and the growth of mobile computing: parallel developments. *The International Review of Research in Open and Distance Learning*, 8(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/348/873
- Cavus, N., Bicen, H., & Akeil, U. (2008, June). *The opinions of information technology students on using mobile learning*. Paper presented at the 08 International Conferences on Educational Sciences, Magosa, North Cyprus.
- Chang, C. C., Yan, C. F., & Tseng, J. S. (2012). Perceived convenience in an extended technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, 28(5), 809-826.
- Chau, P. & Hu, P. (2002). Examining a model of information technology acceptance by individual professionals: An exploratory study. *Journal of Management Information Systems*, 18(4), 191-229.
- Cruz Y., Assar, S., & Boughzala, I. (2012). *Exploring teacher's perception and potential use of Mobile Learning in a Business School*. Paper Presented at the 18th Americas Conference on Information Systems, Washington, United States of America.
- Crompton, H. (2013). A historical overview of mobile learning: Toward learner-centered education. In Z. L. Berge & L. Y. Muilenburg (Eds.), *Handbook of mobile learning*. Florence, KY: Routledge. Retrieved from <a href="https://www.academia.edu/5601076/A\_historical\_overview\_of\_mobile\_learning\_To">https://www.academia.edu/5601076/A\_historical\_overview\_of\_mobile\_learning\_To</a> ward\_learner-centered\_education
- Daniel, E. G. S. (2008). *An emergent Scaffolding Model of Tertiary M-learning: A case study of science teacher education*. Paper presented at 2nd International Mobile Learning and Edutainment Conference, Kuala Lumpur, Malaysia.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340.
- Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, *38*(3), 475-487.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982-1003.



- Ferry, B. (2009). Using mobile phones to enhance teacher learning in environmental education. In J. Herrington, A. Herrington, J. Mantei, I. Olney & B. Ferry (Eds.), *New technologies, new pedagogies: Mobile learning in higher education* (pp. 45-55). University of Wollongong. Retrieved from <a href="http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1081&context=edupapers">http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1081&context=edupapers</a>
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.
- Gibson, S. G., Harris, M. L., & Colaric, S. M. (2008). Technology acceptance in an academic context: faculty acceptance of online education. *Journal of Education for Business*, 83(6), 355-359.
- Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2006). *Multivariate data analysis a global perception*. Upper Saddle River, NJ: Pearson.
- Hanafizadeh, P., Behboudi, M., Koshksaray, A. A., & Tabar, M. J. S. (2012). Mobile-banking adoption by Iranian bank clients, *Telematics and Informatics*, 31(1), 62-78.
- Huang, E. (2005). The acceptance of women-centric websites. *The Journal of Computer Information Systems*, 45(4), 75-83.
- Islam, A. Y. M. A. (2011a). *Online Database Adoption and Satisfaction Model*. Germany: Lambert Academic Publishing. Retrieved from <a href="https://www.morebooks.de/store/de/book/online-database-adoption-and-satisfaction-model/isbn/978-3-8443-2255-2?ref=nf">https://www.morebooks.de/store/de/book/online-database-adoption-and-satisfaction-model/isbn/978-3-8443-2255-2?ref=nf</a>
- Islam, A. Y. M. A. (2011b). Viability of the extended technology acceptance model: an empirical study. Journal of Information and Communication Technology, 10, 85-98. Retrieved from <a href="http://jict.uum.edu.my/index.php?option=com\_phocadownload&view=category&id">http://jict.uum.edu.my/index.php?option=com\_phocadownload&view=category&id=13&Itemid=11</a>
- Kadirire, J. (2007). Instant messaging for creating interactive and collaborative m-learning environments. *The International Review of Research in Open and Distance Learning, 8*(2). Retrieved from <a href="http://www.irrodl.org/index.php/irrodl/article/view/344/874">http://www.irrodl.org/index.php/irrodl/article/view/344/874</a>
- Kafyulilo, A. (2012). Access, use and perceptions of teachers and students towards mobile phones as a tool for teaching and learning in Tanzania. *Education and Information Technologies*. doi:10.1007/s10639-012-9207-y.
- Kim, J. (2009). A Comprehensive Structural Model of Factors Influencing Customers' Intention to Use Biometrics in the Hospitality Industry. University of Nevada, Las Vegas. Retrieved from http://digitalscholarship.unlv.edu/thesesdissertations/939/
- Lawrence, E., Bachfischer, A., Dyson, L. E., & Litchfield, A. (2008). *Mobile learning and student perspectives: An mReality check!* Paper presented at the 7th International Conference on Mobile Business, Barcelona, Spain.
- Lee, Y. H., Hsieh, Y.C., & Hsu, C.N. (2011). Adding Innovation Diffusion Theory to the Technology Acceptance Model: Supporting Employees' Intentions to use E-Learning Systems. *Educational Technology & Society*, *14* (4), 124-137.
- Litchfield, A., Dyson, L., Lawrence, E., & Zmijewska, A. (2007). Directions for m-learning research to enhance active learning. In ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007. http://www.ascilite.org.au/conferences/singapore07/procs/litchfield.pdf

- Mayorga, R. (2010). The professional user: Technology acceptance in a technology driven profession. A Dissertation Presented to the Faculty of the College of Business Administration of TUI University. Cypress, California. Retrieved from <a href="http://udini.proquest.com/view/the-professional-user-technology-goid:305234083/">http://udini.proquest.com/view/the-professional-user-technology-goid:305234083/</a>
- McLean, N. (2003). A report for the royal academy of engineering and the Vodafone group foundation. New York, NY: Oxford University Press.
- Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2004). Mobile technologies and learning. Retrieved from <a href="http://archive.futurelab.org.uk/resources/publications-reports-articles/literature-reviews/Literature-Review203">http://archive.futurelab.org.uk/resources/publications-reports-articles/literature-reviews/Literature-Review203</a>
- Ong, C. S., Lai, J. Y., & Wang, Y. S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information & Management*, 41(6), 795-804.
- Raaij, E. M. V., & Schepers, J. J. L. (2008). The acceptance and use of a virtual learning environment in China. *Computers and Education*, *50*(3), 838-852.
- Robey, D. (1979). User attitudes and management information system use. *Academy of Management Journal*, 22(3), 527-538.
- Seliaman & Al-Turky. (2012). Mobile Learning Adoption in Saudi Arabia. *World Academy of Science, Engineering and Technology, 69,* 356-358.
- Serin, O. (2012). Mobile learning perceptions of the prospective teachers (Turkish republic of northern Cyprus sampling). *The Turkish Online Journal of Educational Technology*, *11*(3), 222-233.
- Shen, J., Hiltz, S. R., & Bieber, M. (2009). Intentions to use virtual worlds for education. *Journal of Information Systems Education*, 20(2), 225-233.
- Shittu, A. T., Basha, K. M., Rahman, N. S. N. A., & Ahmad, T. B. T. (2011). Investigating students' attitude and intention to use social software in higher institution of learning in Malaysia. *Multicultural Education & Technology Journal*, 5(3), 194-208.
- Shittu, A. T., Basha, K. M., Rahman, N. S. N. A., & Ahmad, T. B. T. (2013). Determinants of social networking software acceptance: A multi-theoretical approach. *The Malaysian Online Journal of Educational Technology*, 1(1), 27-43.
- Taylor, S., & Todd, P. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, *6*(2), 144-176.
- Thompson, R., Compeau, R. D., & Higgins, C. (2006). Intentions to use information technologies: an integrative model. *Journal of Organizational and End User Computing*, 18(3), 25-47.
- Torres, M. R. M., Marín, S. L. T., García, F. B., Vázquez, S. B., Vázquez, S. G., Oliva, M. A., & Torres, T. (2008). A technological acceptance of e-learning tools used in practical and laboratory teaching, according to the European higher education area. *Behaviour & Information Technology*, *27*(6), 495-505.
- Tsai, M., & Su, W. (2007). The impact of cognitive fit and consensus on acceptance of collaborative information systems. *Business Review*, 8(2), 184-190.



- Uzunboylu, H., & Ozdamli, F. (2011). Teacher perception for m-learning: scale development and teachers' perceptions. *Journal of Computer assisted learning*, *27*(6), 544-556.
- Venkatesh, V. (2000). Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 342-365.
- Venkatesh V., Morris, M., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425-478.
- Venkatesh, V., & Morris, G. M. (2000). Why don't men ever stop to ask for directions? Gender, social influence and their role in technology acceptance and usage behavior. *MIS Quarterly*, *24*(1), 115-139.
- Wang, Y. S., Lin, H. H., & Luarn, P. (2006). Predicting consumer intention to use mobile Service. *Information Systems Journal*, 16(2), 157-179.
- West, M. (2012). *Mobile learning for teachers global themes*, Paris, France, United Nations Educational, Scientific and Cultural Organization (UNESCO). Retrieved from <a href="http://unesdoc.unesco.org/images/0021/002164/216452e.pdf">http://unesdoc.unesco.org/images/0021/002164/216452e.pdf</a>
- Wishart J. (2009). Use of Mobile Technology for Teacher Training. Retrieved from <a href="http://www.academia.edu/2808648/Use\_of\_mobile\_technology\_for\_teacher\_training">http://www.academia.edu/2808648/Use\_of\_mobile\_technology\_for\_teacher\_training</a>
- Yoon, C., & Kim, S. (2007). Convenience and TAM in a ubiquitous computing environment: The case of wireless LAN. *Electronic Commerce Research & Applications*, 6(1), 102-112.
- Yusofa, A. M., Aziz b, K. A., Daniel E. G. S., Lowd, W. Y., & Paule, A. (2011). *Teachers' Perception on Mobile Learning for Special Needs Learner: A Malaysian case study*. Paper Presented at the APAC M- Learning Conference, Bandung Indonesia.
- Zejno, B., & Islam, A. (2012). Development and validation of library ICT sage scale for the IIUM postgraduate students. *OIDA International Journal of Sustainable Development*, *3*(10), 11-18.
- Zulkafly, N. A., Koo, A. C., Shariman, T. P. N., & Zainuddin, M. N. (2011). *Educators' perceptions towards Mobile Learning*. Paper Presented at the Artificial Intelligence Workshop, Kuala Lumpur, Malaysia.