Advances in Computer Science and Information Technology (ACSIT)
p-ISSN: 2393-9907; e-ISSN: 2393-9915; Volume 4, Issue 5; October-December, 2017, pp. 300-305

http://www.krishisanskriti.org/Publication.html

Determinants of Mobile Learning Acceptance among Student at Al-Madinah International University in Malaysia

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Abstract—*This paper identifies the factors that determine users' acceptance of mobile learning services and its causal relationships using a theoretical model based on the Technology Acceptance Model (TAM). Data relating to the constructs were collected from 500 respondents in Malaysia and subjected to Structural Equation Modeling analysis. The proposed model fits the data well. Results indicate that the important determinants of user acceptance of the mobile learning services are service quality and culture factor, and Behavioral Intention to Use mobile learning services, finally, implications and recommendations of these finding are discussed.*

Keywords*: Mobile Learning, Technology Acceptance Model (TAM), Service Quality and Culture.*

1. INTRODUCTION

Mobile learning or m-learning has recently evolved into a real means of education (Stead, 2005). This has been proven through the growth and impact of groundbreaking technology and implementation of m-learning in the last decade. The growth and development of m-learning has also been in line with the evolution of online world (Alzaza & Yaakub, 2011), and the rapid development of mobile technology has propelled the creation of wireless m-learning on mobile devices (Pulla, 2013). Further, in line with the development of means of communication, the process of learning has also changed where it has evolved from the conventional face-to-face method to the distance learning and e-learning (Azizan, 2010).

2. METHODOLOGY

This study aims to establish an integrated framework that could measure the readiness of student in interacting with Al-Madinah International University in Malaysia. In investigating their readiness, the factors of perceived ease of use (PEOU), perceived usefulness (PU) integrate with two external factors namely Service Quality and Culture and BehavioralIntention to Use mobile learning services, must be validated. A survey was conducted among citizens aged 18 and above in Jordan, to measure the aforesaid factors.

A total of 700 questionnaires were distributed, of which, 500 were appropriate for analyses. From the results, almost all respondents (90%) utilize internet at least 5 times weekly. A rather small percentage of respondents (35%) knew that they could use internet to interact with mobile learning. However, less than 2% of these respondents engaged in such action. Further, majority of respondents had no usage knowledge of mobile learning applications.

3. BACKGROUND OF THE STUDY

Researchers have shown great interest on the success or failure of mobile learning and have so far been mainly investigating into the matter post-trial (Embi&Nordin, 2013). As such, before m-learning is implemented, it is necessary to probe into the elements that impact the acceptance of students, such as factors of acceptance, limitations and requirements (Raisamo, 2014). This is done to help ensure that the money and time invested into the implementation of the system are well spent and hopefully would generate success (i.e. in terms of students' acceptance). Furthermore, the investigation could assist universities in to align their strategic planning with the demands of the students – all of which would lead to better investment in technology (Al-matari et al., 2013; Embi&Nordin, 2013). Also, as indicated by Alzaza and Yaakub (2011), m-learning is a significant alternative platform for learning services, in which having the knowledge on the influencing factors of m-learning acceptance among learners in higher education institutions is crucial. Aside from that, as stated by Liu and Han (2010), an individual's subjective willingness and cognitive engagement in m-learning activities is one of the success keys for m-learning.

Further, when factors associated to acceptance of mobile learning are identified, the universities implementing this

learning method can improve on the delivery of services to the students. Apart from that, when these factors are incorporated into the business process, education and learning will be more efficient and there will be an increase in students' loyalty (Alzaza&Yaakub, 2011; Hilmi et al., 2012; Pimpaka, 2013; Mac Callum& Lynn, 2013). However, according to Al-matari et al., (2013), the university would have to expect the potential factors that may influence students' intention and understand how the factors could encourage them to use m-learning in order to invest the developments of mobile service and content properly. Nonetheless, it would be hard for the students to get the information if they fail to accept a new technology.

However, factors such as service quality, social influence and culture factor impede the involvement of learner and faculty in m-learning or acceptance of new information technology (Ariffin, & Dyson, 2012;Cheon et al., 2012; Shuler et al., 2012; Pimpaka, 2013; Al-Qudah & Kamsuriah, 2014). As such, this necessitates a research that identifies the factors that are considered vital in the acceptance of m-learning from the perspective of the university students.

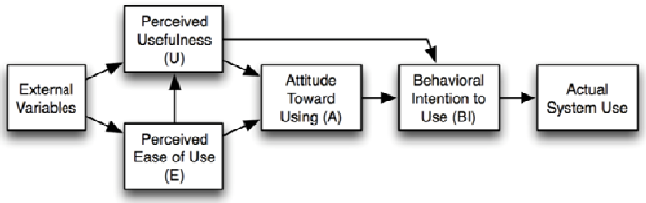
Based on the discussions above, it is evident that there are two prevalent issues in the implementation of m-learning in the higher education institutions. These issues are disparity with regard to the perceptions of technology between students and the university, and insufficient knowledge and incorporation of students' acceptance when deciding on technology investment (Alrasheedi & Capretz, 2015). This is why it is important to look into the factors, limitations and requirements influencing acceptance of m-learning among students in higher learning institutions. Based on the abovementioned, ascertaining the underlying factors or dimensions that influence the acceptance of students towards m-learning becomes the aim of this study. Then, this study will attempt to formulate a model of mobile learning acceptance.

Among the factors that are found to be affecting the acceptance of students towards m-learning are service quality, social influence and cultural differences. Additionally, the factor of service quality also affects users' acceptance intention. Furthermore, according to Liu and Han (2010) it service quality also shows a positive causal relationship between the satisfaction of user concerning a web portable, as well as the perceived overall quality of service. Also, according to Abu-al-aish and Love (2013), service quality has an effect on users' acceptance intention. Therefore, the service quality is an important determinant of students' attitude towards using m-learning. Moreover, understanding the services quality factor will help universities to deliver high quality services to students and improve their pedagogical and learning strategic plans.

Aside from that, considering that the market for mobile learning has gradually become global, cultural difference also becomes an important factor; thus universities or training organizations should have the knowledge of cultural difference so that they would earn the significant competitive edge (Ariffin, & Dyson, 2012 ; Pimpaka, 2013). According to Ariffin (2011), the cultural perspectives of mobile learning in Malaysia context is an aspect that has yet to be covered. There is a need to re-conceptualize learning for the mobile age, to recognize the essential role of mobility and communication in the process of learning, and to indicate the importance of context in establishing meaning, and the transformative effect of digital networks in supporting virtual communities that transcend barriers of quality and culture. So, the effectiveness of existing models still needs to be enhanced – to which researchers have indicated certain factors must be taken into consideration such as the service quality, social influence and cultural factor. This study is essential in bridging the gap in the development of services in order to create more efficiency and relevance in the context of higher education environment – all of which could be achieved through the expansion and use of the Technology Acceptance Model (TAM).

4. TECHNOLOGY ACCEPTANCE MODEL (TAM)

Technology acceptance model or TAM was formulated to explain the determining factors of user acceptance in a wide array of end-user computing technologies (F. D. Davis, 1986). As stated by Tung et al., (2014), this model was based on Ajzen and Fishbein's (1980) theory of reasoned action or TRA. Additionally, since TRA is a model that is well-established, many scholars various fields employ it in explaining and predicting human behaviour. Originally, TAM consisted of five components namely, perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using (ATU), behavioral intention to use (BI), and behaviour system use. Specifically, as indicated by Fred D. Davis (1989) PEOU represents the degree to which a user believes that using a particular service would be effortless, while PU means the degree to which an individual perceives that using a particular system would improve the performance of his or her job. PEoU and PU are the two most important factors for system use and in fact, according to Liu and Han (2010) these two elements (PEoU and PU) are the key beliefs which lead to user acceptance of information technology. Meanwhile, ATU directly predicts BI of the users, which determines AU.



Figurer 1. Technology Acceptance Model (TAM) (Davis, 1986).

5. RESEARCH DIMENSIONS AND HYPOTHESIS

The model chosen in this research is based on its global and integrative approach. This means that in elucidating technology acceptance and use, this research puts in a vast

amount of explanatory variables obtained from the major theoretical models Martín and Herrero(2012). The TAM presents two key drivers of information systems' adoption. These drivers are perceived ease of use (PEOU), perceived usefulness (PU) integrate with two external factors namely Service Quality and Culture.

6. SERVICE QUALITY

Service quality is generally derived from the perspective of customer attitudes, where quality refers to satisfying the requirements of the customer (Geetika & Nandan, 2010). In terms of successfully fulfilling requirements of customers, El Saghier and Nathan (2013) stated that it depends on the ability of the organization to identify and meet these requirements. From viewpoint of the organization, customers must be perceived as persons with individual requirements and in instances where a standard level of service quality is established to satisfy these requirements, organizations that claim to be providing their customers with high-quality services are obliged to satisfy the requirements of their customers. If this can be achieved, the said organization will have positive image in the marketplace, which will give them an edge over their rivals. Also, as documented by El Saghier and Nathan (2013) not only high-quality service leads to decrease in negative quality (poor service and inconsistency) but it also leads to increase positive qualities like luxury and fun, and this leads to the creation of value.

H1: Service quality will have a positive effect on perceived ease of use (PEOU), Behavioral Intention to use mobile learning services.

7. CULTURE FACTOR

Culture refers to, "the collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede, 1991) or simply put, culture is any shared values of a particular group of people (Erez & Earley, 1993). Further, according to Shore and Venkatachalam (1996) culture indicates the individual's core values and beliefs which were formed during childhood and reinforced throughout life, while Hasan and Ditsa (1999) define culture as, "the beliefs, philosophy, shared values, attitudes, customs, norms, rituals, common practices, and traditions which govern the ways of living of a group of people." Culture can also be expressed in terms of values and norms, where values, according to Laurent (1993), are what is worth doing or having, and are shaped by experience with parents, school, religion, and the media, while norms as highlighted by Straub et al., (2002), encompass any shared beliefs with regard to behaviour. On the other hand, Goodman and Green (1992) observe culture as discrepancies that occur between the beliefs, values, and motivations of groups that are dissimilar from one another, while other scholars such as Samovar et al., (2009) perceive culture as the sum of values, beliefs, attitude, experience, knowledge, religion, meanings, hierarchies, meanings, roles, spatial relationships, concepts of the universe, notions of time and material objects and possessions attained by a group of people along the timeline of generations by individuals and the group.

H2: Culture will have a positive effect on perceived ease of use (PEOU), to Behavioral Intention use mobile learning services.

8. PERCEIVED EASE OF USE

Perceived ease of use is defined as the "the degree to which an individual; believes that using a particular system would be free from physical and mental effort" Davis, (1991). It has also been defined as a user's subjective perception of the effortlessness of a computer system. This follows from the definition of the word "ease": "freedom from difficulty or great effort." Effort is a finite resource that a person may allocate to the various activities for which he or she is responsible .All else held constant, an application perceived to be easier to use than another is more likely to be more accepted by users. Perceived ease of use explains the user's perception of the amount of effort required to utilize the system or extent to which a user believes that using a particular technology will be effortless (Davis et al., 1989). Perceived ease of use has been established from previous research to be an important factor influencing user acceptance and usage behavior of information technologies (Igbaria, Livari, &Maragahh, 1995). Perceived ease of use consists of the following determinants: easy to use, easy to read, using understandable terms, able to link to search for related information and easy to return to previous page. This includes support, complexity and change management. Venkatesh (2000) reported perceived ease of use 'describes the individual's perception of how easy the innovation is to learn and to use'. Given that some fraction of a user's total job content is devoted to physically using the system per se, if the user becomes more productive in that fraction of his or her job via greater ease of use, then he or she should become more productive overall. Users believe that a given application may be successful, but they may, at the 15 same time, believe that the technology is too hard to use and that the performance benefits of usage are outweighed by the effort of application (Davis & Arbor 1989). Gefen and Straub (2000) suggested managers and co-workers need to realize that the same mode of communication maybe perceived differently by the sexes. This argument is strengthened by the studies on the effects of gender and their ease to use a new technology. Venkatesh et al., (2000) found gender differences in individual adoption and sustained usage of technology in the workplace. In their study, men's decision in this regard were more strongly influenced by their attitude towards using the new technology, while women were more strongly influenced by their subjective norm and perceived behavior control.

H3: Perceived ease of use will have a positive effect on Behavioral Intention to Use mobile learning services.

9. PERCEIVED USEFULNESS

Perceived usefulness been defined as a person's subjective perception of the ability of a computer to increase job performance when completing a task, which affects their perceived usefulness thus having an indirect effect on user's technology acceptance. It is defined as 'the degree to which a person believes that using a particular technology will enhance his or her job performance' (Davis, 1986). Perceived usefulness refer to consumers' perceptions regarding the outcome of an experience. This follows from the definition of the word useful: "capable of being used advantageously." Within an organizational context, people are generally reinforced for good performance by raises, promotions, bonuses, and other rewards (Pfeffer, 1982). A system 16 high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive use-performance relationship. People tend to use or not to use a system application to the extent they believe it will help them perform their job better (Davis et al., 1989). Usefulness can also be defined as the prospective adopter's subjective probability that applying the new technology from foreign sources will be beneficial to his personal and/or the adopting company's well-being .Or that using the technology would improve the way a user could complete a given task. Perceived usefulness explains the user's perception to the extent that the technology will improve the user's workplace performance (Davis et al., 1989). This means that the user has a perception of how useful the technology is in performing his job tasks.

H4: Perceived usefulness will have a positive effect on Behavioral Intention to Use mobile learning services.

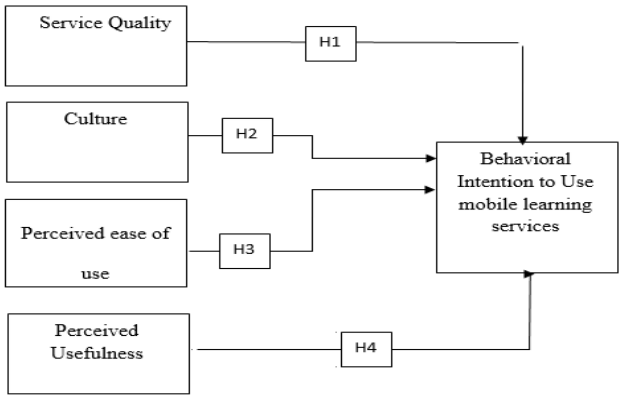


Figure 1: Research model

10. INSTRUMENT DEVELOPMENT

The items used in this study were derived from validated instruments on mobile learning Venkatesh et al., 2003.The items were constructed to ascertain the awareness of respondents of the online access to the learning. Chronbach's alpha was used to determine the items' reliability and the values generated for the items were greater than the proposed cut-off of 0.70.

Table 1: Reliability Analysis

VARIABLES	ITEMS #	RELIABILITY
Service Quality	20	.921
Culture	15	.874
perceived ease of use	5	.787
perceived usefulness	5	.847
Behavioral Intention	4	.717

11. DATA ANALYSIS

The model proposed in this study was tested employing the technique of multiple linear regression analysis. The independent variables are perceived ease of use (PEOU), perceived usefulness (PU) integrate with two external factors namely Service Quality and Culturewhile the dependent variable is Intention to Use mobile learning services.

12. RESULTS

The multiple linear regression analysis outcomes are presented in Table 2. The adjusted R2= 0.721. The significance for all variables is tested, and the variables of perceived ease of use (PEOU), perceived usefulness (PU) integrate with two external factors namely Service Quality and Culturewhile the dependent variable is Intention to Use mobile learning servicesin Internet appear to show significance.

Table 2: The multiple linear regression analysis

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	851[a]	.812	.721	.422

Predictors: (Constant), perceived ease of use (PEOU), perceived usefulness (PU) integrate with two external factors namely Service Quality and Culture while the dependent variable is Intention to Use mobile learning services.

Table 3 shows the significance of constructs, and supported hypotheses

Table 3: Hypotheses test

Hypotheses	Variable	Beta	T	P.	Supported
H1		.321	5.214	.030	Yes
H2		.423	3.881	.000	Yes
H3		.551	2.721	.001	Yes
H4		.454	6.021	.004	Yes

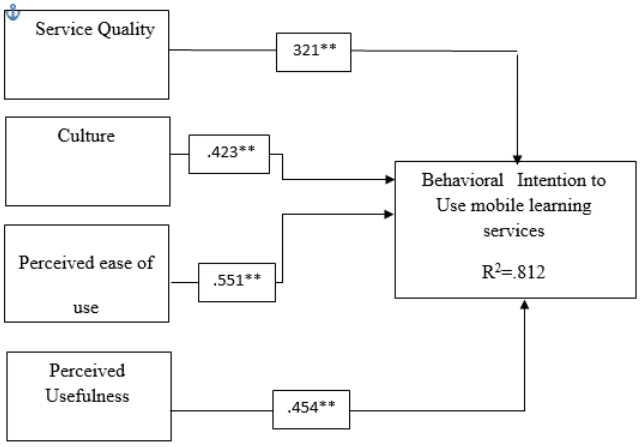


Figure 2: Regression Model

13. DISCUSSION AND IMPLICATIONS

This study delved into the degree to which the citizens of Jordan possess the readiness to use mobile learning services. The constructs of performance expectancy, effort expectancy, social influence and facilitating conditions were used and elucidated. It is important that these factors are addressed by learning so that mobile learning usage among citizens could be increased. Data from citizens from many walks of life were collected and analyzed. Using data from a diverse pool, for the context of this study, will make the outcomes more representative of the population. A model that is appropriate to the setting of Jordan is proposed: it incorporates constructs from the Technology Acceptance Model (TAM). This model explains 85% of the variance in the intention of respondents to use M-learning. As for the Performance expectancy, effort expectancy, social influence and facilitating conditions' construct, the intent of citizen in employing electronic learningwill increase providing that they believed that the internet would make them more efficient in collecting information from the learning and in interacting with the learning , and give them better control over their interaction with the learning . It is important that learning increases the citizens' awareness about the services that are available online. In other words, learning should adopt an awareness initiative for that purpose. The current technology should also be taken into account by learning, especially the social media. It is then crucial that learning make the effort to switch to modern medium to replace the conventional one. This enables learning to make available real time information to citizens. The next research should try to integrate the model proposed in this study with other constructs. These constructs include service quality and computer self-efficacy. Also, the forthcoming study should select sample from other regions in Jordan as this study's sample is only from one region. This study adds to the literature by further validating the constructs of performance expectancy, effort expectancy, social influence and facilitating conditions measures and by demonstrating the way these measures are linked to the construct of M-learning. The model and the measures brought forth by this study could provide better comprehension to both practitioners and researchers on mobile learning with respect to its dimensions, antecedents and consequences.

14. CONCLUSION

This study brings forth a framework of mobile learning services adoption. The variables impacting the intention of citizen to utilize electronic learning services were ascertained via the integration of variables derived from the Technology Acceptance Model (TAM). Based on the results, performance expectancy, effort expectancy, social influence and facilitating conditions significantly impact respondents' intention to use mobile learning services.

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