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A Study on Acceptance of Mobile School at Secondary Schools in Iraq: Urban vs. Rural

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Abstract: Developing countries are facing dilemma where sophisticated technologies are more advance as compared to the way their people think. In education, there have been many novel approaches and technologies were introduced. However, very minimal efforts were put to apply in our education. Mobile school is a mobile learning (m-Learning) management system, developed for administrative, teaching and learning processes at secondary schools in Iraq. The study presents the acceptance of mobile school between urban and rural secondary schools in Iraq. Research framework was designed based on Technology Acceptance Model (TAM). The constructs of the framework include computer anxiety, self-efficacy, facilitating condition, technological complexity, perceived behavioral control, perceive ease of use, perceive usefulness and attitude. Questionnaire was applied as research instrument which involved 373 students from four secondary schools (two schools in urban category and another two in rural category) in Perak. Inferential analyses using hypothesis and t-test and descriptive analyses using mean and percentage were used to analyze the data. Results showed that there were no big difference (<20%) of all acceptance constructs between urban and rural secondary schools except computer anxiety.

Key words: Acceptance, m-Learning, urban, rural, technology acceptance model, administrative

INTRODUCTION

Mobile school is an m-Learning management system that developed for administrative, teaching and learning at secondary schools in Iraq (Hashim *et al*., 2013). The functions of this system include, registering user account, school announcement, uploading/downloading learning materials, online course discussion, academic report and some others. This system was developed for the use of school administrators, teachers, students and parents. This system can be accessed via. smartphones and also via computer web browser (for school administrators and teachers only).

There have been many studies conducted on acceptance of m-Learning in tertiary education (Almatari *et al*., 2013; Ayoade, 2015; Jawad and Hassan, 2015). However, very limited empirical evidence were found on acceptance of m-Learning at secondary level with the focus of comparison between secondary schools in urban and rural. Therefore, this study is conducted to measure the acceptance of mobile school between students from urban and rural secondary schools.

This study aims to observe the difference of acceptance constructs which adapted from Technology Acceptance Model (TAM) (Davis, 1989) including computer anxiety, self-efficacy, facilitating condition, technological complexity, perceived behavioral control, perceive ease of use, perceive usefulness and attitude between urban and rural secondary schools. This study is very important to see how much difference of m-Learning acceptance between urban and rural secondary schools, hence, the authorities can take this measurement to prepare necessary action plans in improving the current education strategies and plans.

Literature review: There have been many studies conducted on acceptance of m-Learning in tertiary education and very limited studies were found for secondary education. There was a study conducted by (Ayoade, 2015) ENREF 9 on factors influencing student's behavioral intention to adopt m-Learning in higher education where this study was conducted at Ekiti State University, Nigeria. This study applied original Unified Theory of Acceptance and Use Technology (UTAUT) Model (Venkatesh *et al*., 2003) to validate the acceptance of m-Learning. Questionnaire was distributed to 250 students from five different schools and the data then was analyzed using regression analysis. The finding showed

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that three out of four factors from variables of original UTAUT Model had significant positive effects on student's intention to adopt and use m-Learning. The factors are performance expectancy, effort expectancy and social influence and performance expectancy was the strongest factor. Facilitating condition in this study had no significant effect to the intention to use m-Learning. As discussed, this finding is in line with the findings of Al-Hujran *et al.* (2014) where this scenario happened maybe because of the context of developing countries in which the influence of facilitating conditions on technology adoption is not direct (Datta, 2011).

Almatari *et al.* (2013) in their study proposed the factors that influence student's intention in using m-Learning where this study was conducted among students at Universiti Teknologi Malaysia. This study was conducted based on UTAUT which involved four basic independent variables; performance expectancy, effort expectancy, social influence and facilitating condition (Venkatesh *et al.*, 2003). This model was then integrated with additional three independent variables which suggested by Wang *et al.* (2009) self-management of learning, perceived playfulness and voluntariness of use. Self-management of learning refers to the student's perceive ability to manage their studies themselves with high self-discipline to engage with learning activities via smartphones. Meanwhile, perceived playfulness refers to users' concentration, curiosity, enjoyment and interaction with mobile devices and finally, voluntariness of use refers to user's willingness to embark in the teaching and learning via. smartphones.

By applying the same model as Almatari *et al.* (2013), Jawad and Hassan (2015) conducted a study to evaluate the acceptance of m-Learning in Iraq higher education. A questionnaire was distributed to 159 respondents including undergraduate (n = 114) and postgraduate (n = 18) students and lecturers (n = 27). Based on six factors (independent variables), strongest factor is performance expectancy followed by self-management learning, effort expectancy, perceived playfulness, social influence and facilitating conditions. In another study which was conducted by Ugur *et al.* (2016) all five factors had significance influence towards behavioral intention of adopting m-Learning among 491 students at Sakarya University. The results showed the strongest influential factor is performance expectancy followed by effort expectancy, self-management of learning, social influence and facilitating conditions. Based on these two studies, similar findings were obtained.

The same model was also applied by Chye *et al.* (2014) to evaluate the factors that influence students of Universiti Tunku Abdul Rahman towards behavioral intention to use m-Learning. Multiple regression analysis was utilized to analyze the data obtained from questionnaire that has been distributed to 372 respondents. This study found that all factors had positive significant influence towards behavioral intention to use m-Learning except for effort expectancy which contradicted with many previous studies including (Bugense, 2010).

Similar study was also conducted by Abu-Al-Aish and Love (2013) which investigating factors influencing the acceptance of m-Learning which involved 174 second year students in the School of Information, Computing and Mathematical Science, Brunel University. The contribution of this study was a new independent variables incorporated in original UTAUT Model which are quality of service and personal innovativeness. Quality of service refers to user's perceive satisfaction towards the service provided particularly m-Learning while personal innovativeness refers to the individual willingness to try, embark or utilize new technology in performing teaching and learning activities. The result showed that all validated factors including performance expectancy, effort expectancy, lecturer's influence, quality of service and personal innovativeness were significant toward behavioral intention to adopt m-learning.

Another study of acceptance on m-Learning conducted by Nassuora (2012) for higher education at Saudi Arabia. This study similarly adopted UTAUT Model where original constructs were retained in the research framework. This study apply pearson's product moment correlation to evaluate the significant relationship between the constructs and dependent variables including behavioral intention and attitude towards behavior. The result showed that more than half of the students in this study were not familiar with m-Learning. However, they had a good perception with m-Learning where the effort expectancy and facilitating conditions indicated high level of acceptance towards the behavioral intention towards the implementation of m-Learning.

There were also study on acceptance of m-Learning using other user acceptance model which is Technology Acceptance Model (TAM) which was introduced by Davis (1986) and Adedoja *et al.* (2013) applied TAM to evaluate student's acceptance of mobile phones for distance learning. The study involved 201 students from University of Ibadan. Original model was retained in this study where the model includes eight constructs including perceived usefulness, perceived ease of use interest, technology self-efficacy, attitude, behavioral intention, actual use and acceptance of the model.

Multiple regression analysis was carried out to interpret the data where 67.5% accounted for variation in predicting acceptability of the mobile platform.

Almasri (2014) in his study proposed additional construct to the TAM which is Mobile readiness based on the argument by Tsuma *et al*. (2013) where readiness to apply new technology is a critical issue to determine success of m-Learning implementation and usage of the technology for teaching and learning. In another study conducted by Chung *et al*. TAM model has been utilized to evaluate the acceptance of Taiwanese EFL College students towards using m-Learning for learning English. The constructs of TAM were retained in this study where self-efficacy, compatibility, perceived usefulness and perceived ease of use were selected as independent variables. Result indicated that perceived usefulness, perceived ease of use, self-efficacy and compatibility account for 71% (R^2 = 0.719) of the variance explained in behavioral intentions to use mobile english vocabulary learning resources. Interestingly, compatibility construct was the strongest construct that influenced learner's behavioral intention to use mobile english vocabulary learning resources.

MATERIALS AND METHODS

The main objective of this study is to evaluate the difference between acceptance level of a developed m-Learning management system called mobile

Preliminary study was the early stage of this study where the scope and dimension of the study is set. There have been few evaluation conducted to mobile school including usability (Hashim and Ahmad, 2015) and effectiveness (Hashim *et al*., 2013) hence, this study was conducted in different dimension which is acceptance. This step also involved preparation of mobile school where the system should run well, all functions are working properly and allocation of enough bandwidth for simultaneous access.

Literature review was then conducted to review existing acceptance research frameworks and models to be applied in this study. Based on the reviews, research framework as presented in Fig. 2 was formulated. This framework was adopted from the study conducted by Sarlan *et al*. (2013) and Aypay *et al*. (2012) where the basis of the framework was taken from (Davis, 1989). Figure 2 illustrates the research framework which was utilized to conduct this study.

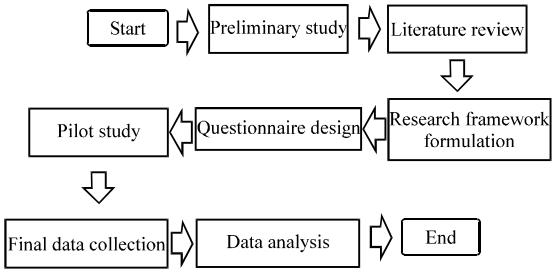

Fig. 1: Research flow

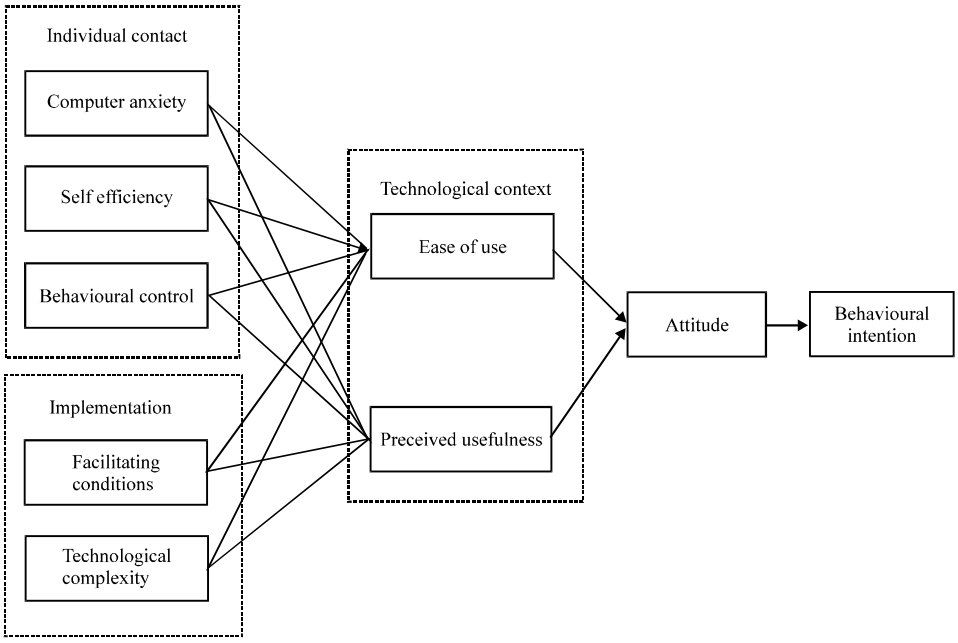

Fig. 2: Research framework

Table 1: Internal consistency of questionnaire

Construct	Cronbach alpha
Computer anxiety	0.8675
Self-efficacy	0.7378
Behavioral control	0.7126
Facilitating condition	0.8811
Technological complexity	0.7945
Ease of use	0.7111
Perceived usefulness	0.7903
Attitude	0.7741
Behavioral intention	0.8025

Table 2: Fraction of number of respondents

Categories	No. of respondents
Urban	93
	97
Rural	88
	95

Based on the framework formulated, nine constructs were incorporated; computer anxiety, self-efficacy, behavioral control, facilitating conditions, technological complexity, ease of use, perceived usefulness, attitude and behavioral intention. Questionnaire which applying likert scale of 1-5 was then designed based on these constructs which also adapted from studies conducted by Aypay *et al*. (2012), Sekaran and Roger (2010).

This study is slightly different with other acceptance study where the acceptance of the technology was measured based on real implementation of the technology rather than evaluation based on only perception without practically trying the technology. Pilot study was then conducted where the questionnaire was distributed to 30 students. All respondents required to try mobile school before answering the questionnaire. Based on this pilot test internal consistency of the questionnaire which denoted as Cronbach alpha was measured. Table 1 presents the value of Cronbach alpha for each construct. Based on the values, all constructs were acceptable (>0.7) (Sekaran and Roger, 2010), thus, questionnaire is ready for real study.

The questionnaire was the distributed to 373 students from four secondary schools (two schools in urban category and another two in rural category). This number of respondents was determined from cluster random sampling method. Table 2 presents the fraction of number of respondents.

The data collected were entered in Statistical Package for Social Science (SPSS) for analysis purposes. To evaluate the comparison of acceptance level between urban and rural secondary schools, two types of analyses were applied; inferential analysis using t-test and descriptive analysis. For inferential analysis, nine null hypotheses were constructed as follows:

- H_{01}: there is no significant difference between computer anxiety of students in urban and rural
- H_{02}: there is no significant difference between self-efficacy of students in urban and rural
- H_{03}: there is no significant difference between behavioral control of students in urban and rural
- H_{04}: there is no significant difference between facilitating condition of students in urban and rural
- H_{05}: there is no significant difference between technological complexity of students in urban and rural
- H_{06}: there is no significant difference between ease of use of students in urban and rural
- H_{07}: there is no significant difference between perceived usefulness of students in urban and rural
- H_{08}: there is no significant difference between attitude of students in urban and rural
- H_{09}: there is no significant difference between behavioral intention of students in urban and rural

For descriptive analysis, mean and percentage were applied to interpret the data.

RESULTS AND DISCUSSION

The data collected were analyzed using two types of analyses; inferential and descriptive. For inferential analysis, t-test was applied to examine the significant difference of the constructs tested between urban and rural secondary schools. Table 3 presents the result obtained from this analysis.

There are nine null hypotheses constructed for t-test analysis. Based on Table 3, p-value for all constructs were more than $\alpha = 0.05$ except for computer anxiety. Thus, all hypotheses except computer anxiety were accepted. In other word, there were no significant difference on self-efficacy, behavioral control, facilitating condition, technological complexity, ease of use, perceived usefulness, attitude and behavioral intention between urban and rural secondary schools. This result was then strengthened with the finding obtained from descriptive analysis (Table 4).

The questionnaire applied likert scale of 1 (strongly disagree) to 5 (strongly agree). Mean scores for all constructs were higher than mean scale (3.00) except for computer anxiety. Computer anxiety was one and only negative construct where it refers to the user's fear in using the system. That was the reason why this construct obtain score of below that mean scale. To elaborate more, percentage of agree was applied to interpret the result. Percentage of agree refers to the percentage of users rated strongly agree (scale 5) and agree (scale 4) for all

Table 3: Presents the result obtained from this analysis

Hypothesis	Construct	Sig. (p-values)	Accept/Reject
H$_1$	Computer anxiety	0.001	Reject
H$_2$	Self-efficacy	0.059	Accept
H$_3$	Behavioral control	0.071	Accept
H$_4$	Facilitating condition	0.076	Accept
H$_5$	Technological complexity	0.083	Accept
H$_6$	Ease of use	0.060	Accept
H$_7$	Perceived usefulness	0.051	Accept
H$_8$	Attitude	0.066	Accept
H$_9$	Behavioral intention	0.130	Accept

Table 4: Presents the result of descriptive analysis

		Agree	
Construct/Category	Mean	Percentage	Difference (%)
Computer anxiety			
Urban	2.34	32.30	
Rural	2.16	41.20	21.60
Computer self-efficacy			
Urban	4.03	81.60	
Rural	3.83	75.30	7.72
Facilitating condition			
Urban	3.79	59.10	
Rural	3.31	68.20	13.34
Technological complexity			
Urban	3.72	72.10	
Rural	3.66	68.70	4.72
Perceived behavioral control			
Urban	3.85	77.70	
Rural	3.76	75.20	3.21
Perceive ease of use			
Urban	3.83	79.60	
Rural	3.77	75.30	5.40
Perceive usefulness			
Urban	3.72	78.40	
Rural	3.69	76.50	2.42
Attitude			
Urban	3.79	76.40	
Rural	3.89	77.80	1.80

constructs. Consistent with mean score, computer anxiety was rated the lowest as compared to other constructs.

Finally, the difference column explained the difference of percentage of agree between urban and rural schools for each acceptance construct. Based on thorough readings, there was no single study discuss on the difference of acceptance constructs between urban and rural schools, hence there is no suitable benchmark to compare this finding with existing similar study. Therefore, difference of percentage of agree between urban and rural schools was applied to evaluate how big the difference is. The biggest difference was computer anxiety where students in rural schools have more fear to utilize the system as compared to students in urban schools. The second highest difference was facilitating condition where students in rural require more aids and supports to operate the system. The third highest was self-efficacy followed by perceive ease of use, technological complexity, perceived behavioral control, perceive usefulness and attitude towards the system.

CONCLUSION

This study was conducted to evaluate the acceptance level of mobile school by the students and urban and rural secondary schools by evaluating nine acceptance constructs; computer anxiety, self-efficacy, facilitating condition, technological complexity, perceived behavioral control, perceive ease of use, perceive usefulness and attitude. Technology Acceptance Model (TAM) was adapted to guide this study. Findings showed that there were not much difference (<20%) of all these constructs between urban and rural schools except computer anxiety. This finding was supported by all analyses conducted including t-test, mean, percentage of agree and difference of percentage of agree.

RECOMMENDATIONS

This study will be continued with the analysis using Structural Equation Modeling (SEM) where another dimension of study will be investigated. This study could also be expanded to boarding schools where this category of schools might require this kind of system for their administrative, teaching and learning activities. It is due to the one of the functions provided in the system where parents could monitor their children's academic activities by participating in course discussion. Moreover, this study could also involve other stakeholders including school administrators, teachers and parents, since, mobile school was also developed for academic institution as a whole and not limited to only students.

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