

Experience moderator effect on the variables that influence intention to use mobile learning

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ABSTRACT

The study has two objectives, first is exploring the variables that affect the intention to use mobile learning and second is investigating the experience moderator effect on the variables that influence intention to use mobile learning in higher education institutions (HEI) in Iraq. Then formulate a model for intention to use mobile learning. A questionnaire has been conducted in this research for collecting the feedback from the participants. The findings confirmed that social influence (SI), performance expectancy (PE), "facilitating conditions" (FCs), effort expectancy (EE) and "satisfaction" (SA) have an important influence on the intention to use mobile learning. But, this study has rejected the "personal innovativeness" (PINN) factor as it was found not important. Furthermore, the study has confirmed that the experience moderator variable has an influence of EE, SI, and PE on the intention to use mobile learning. This study is significant to the field of discipline as it will provide a roadmap for HEI to recognize the factors that affect the intention to use mobile learning.

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1. INTRODUCTION

The main objective of this research is to explore the variables that affect the intention to use mobile learning in addition to formulating a model for intention to use mobile learning in HEI in Iraq. Mobile learning becomes an important part of learning and education for facilitating learning experiences [1]. Mobile learning has historically been additionally developed among the informal education fields. However, throughout the previous years, there's an increasing interest in the mixing of those innovations in formal education. One of the major components that required to successfully accomplish this integration method, is that the mobile technologies acceptance by the teachers [2]. The growing enlargement of mobile technology in community has become a fact [3].

In some countries, the governments have accomplished the specified level of satisfaction in giving mobile services to their voters though at the same time a number of the countries are still behind from the specified level [4], [5] study mentioned the affordances of mobile application include; cost efficient, able to motivate students, suitable for drill and practice exercises and support personal learning environment. Moreover in general mobile application support various approach of learning, both formal and informal [6]. Several organizations have focused their efforts on using the emerging digital technology for their users [7].

2. RELATED WORKS

This part will discuss with details the model of the unified theory of acceptance and use of technology (UTAUT), and the intention to use also the variables affect the intention to use of mobile learning in previous studies. Moreover, it will argue the experience moderation influence on the variables that affect the intention to use mobile learning.

2.1. The model of the unified theory of acceptance and use of technology

The model of the UTAUT was developed and proposed by investigators via the combination of eight main theories in behavioral prediction. Regarding to UTAUT it is consists of four factors: performance expectancy; facilitating conditions; social influences and effort expectancy [8], [9] research is to investigate the variables that affect university users' intentions for mobile learning acceptance. According to UTAUT, this research proposes a model to investigate the variables that affect the acceptance of mobile learning in HEI and to examine if prior mobile devices experience has effect on the mobile learning acceptance. Tan *et al.* [10] research empirically explores the factors that affect the learner's intention for mobile learning adoption using the approach of hybrid structural equation modeling-artificial neural networks (SEM-ANN) in Malaysia.

2.2. The variables affect intention to use

They are multiple variables that affect the intention to use of mobile learning have been identified in previous studies. This research will focus on the important variables that affect intention to use.

2.2.1. Performance expectancy

Performance expectancy (PE) could be described as the level to which a user accepts using the data frame would support him to acquire benefit from the implementation of the work. Furthermore, they also point out that performance expectancy considers as the most great indicator of intention to use mobile learning [11]. "H1: Performance expectancy has a positive effect on intention to use of mobile learning."

2.2.2. Effort expectancy

Effort expectancy (EE) is characterized by the level of ease that linked to the use of the system [11]. To take full advantage of the framework, studies must accept the mobile learning framework is meeting their values and needs. Previous research [12] has demonstrated the crucial influence of the perceived ease of use on intention to use. "H2: Effort expectancy has a positive effect on intention to use of mobile learning."

2.2.3. Social influence

Individuals who are related to each other in community and change their behavior to a certain degree in understanding with individuals who deem it necessary or have a same social stat [13]. Social influence (SI) has a vital role in affecting the recognition of possible adopters. Since the degree of instability is high in early regulation of innovation allocations, possible clients tend to look for positive proof of employment findings from other social performers. The process is described as "influence to accept information from another as evidence about reality" [14]. Studies have indicated that experience has a moderating impact on the social influence on a learner's behavioural intention for using mobile learning [11]. "H3: Social influence has a positive effect on intention to use of mobile learning."

2.2.4. Facilitating conditions

A facilitating condition could be described as the degree to which a user believes that a specialized and organizational framework is able for supporting the use of unused innovation in agreement with [11]. facilitating conditions (FC) were also presented by UTAUT model and were categorized as "degree to which users believe that the necessary infrastructures exist to support the use of a technological system" [11]. FC could be everything that works successfully to implement an evaluation method such as technical or organizational support, knowledge, administrative resources. The study showed that Facilitating Conditions has a critical impact on intention to use [11]. "H4: Facilitating conditions has a positive effect on intention to use of mobile learning."

2.2.5. Personal innovativeness (PINN)

According to Poong *et al.* [15] study mentioned whether a person adopts long-term innovation based on her or his innovation. Previous researchers have discovered that individuals with high degrees of innovation resort to have higher degrees of behaviour intention for modern innovations adoption [16]. According to [17] study, a user with a high degree of innovation has the capability to overcome with uncertainties and is ready to face challenges. Often this is vital in dealing with the adoption of technology

due the result of employing modern innovation is still obscure when it has not already been used. [17] study distinguished four degrees of innovations: early adopters, early majority, late majority and laggards. "H5: Personal innovativeness has a positive effect on intention to use of mobile learning."

2.2.6. Satisfaction (SA)

Mohammadi [18] study mentioned instead of selling, to supplying, or to serving, the major aim of every business is users satisfaction and satisfy and meet their needs [19]. Satisfaction can be described as the users' comprehension of the degree to which their desires, objectives and needs have been completely met and their overall vision of information system [20]. "H6: Satisfaction has a positive effect on intention to use of mobile learning."

2.2.7. Intention to use (ITU) and actual use (AU)

Intention to use could be also considered as an behavior [21]. Within the acceptance domain, previous studies have been investigated the contextual link between the intention to use and the actual use in mobile learning or e-learning such as [21]-[23]. In [21] study emphasizes the intention to use positively influence the actual use. Therefore, the intention to use has a positive relationship with the actual use. Actual use of a particular innovation is defined to be dependent upon the behaviour intention of a customer towards that innovation [24], [25]. "H7: Intention to use has a positive effect on actual use of mobile learning."

2.3. Mobile experience moderator

Mobile experience could be described as a generic expertise with mobile phones services for example mobile broadcasting, mobile shopping, short messaging service (SMS), mobile learning and mobile games and not as an expertise with one specific mobile phone favor. Generally, experience is expected to raise the certainty of customers in their capability to use and support computers that support the implementation of their mission. The findings from previous researches point out that a user's experience is vital for user's understanding, perceptions and attitudes in online learning and teaching environments.

Thus, it is important to think about how the differences can be seen in their confrontations using portable non-teaching exercises tools and how these talents could be exchanged within the learning approach. [11] study debates that experience could moderate the influence on intention to use. Moreover, [26] study confirmed the experience moderator has a positive influence on the link between the performance expectancy and the intention to use. This means, when the students have more experience, then they will achieve and accept the mobile learning. The experience moderates the influence of effort expectancy on intention to use and those influences reduce with experience. The impact of social influence on intention is conditioned on experience moderator included here for example the study discovered it to be unimportant when the data were analysed without the inclusion of experience moderator [11].

Zaremohazzabieh *et al.* [27] study indicated that the result showed that the experience has moderating influence on the relationships between the performance expectancy and effort expectancy within the behavioural intention to use mobile learning. Besides, previous studies recommends the experience would moderate the link between the social influence and intention to use. According to the [28] research, social influence seems as necessary as it was in the beginning phase of experience when the user initially uses the innovation.

"H8: Experience is a moderating variable influencing the effect of performance expectancy on intention to use of mobile learning."

"H9: Experience is a moderating variable influencing the effect of effort expectancy on intention to use of mobile learning."

"H10: Experience is a moderating variable influencing the effect of social influence on intention to use mobile learning."

3. RESEARCH METHODOLOGY

Research methodology represents the significant and main stage in the development of the research to assure important and systematic research into the phenomenon's examination. The objectives of the articulated research directed the researcher to embrace appropriate step by step approach to reach them.

3.1. Research approach (quantitative)

Quantitative approach characteristically indicates to integrated surveys that are managed for people or families, which are identified through a variety of forms of samples normally random samples [29], [30]. Quantitative data includes categories and numbers are ideally analyzed with the tools of statistical methods. This research uses the survey (questionnaire) for collecting the data required from the target group, and then

analyzed by SPSS and AMOS software to propose the initial model. Of course, the imperative for developing a specific model is driven from the research gap in a specific area of research [31].

3.2. Survey (questionnaire)

Firstly, this study utilizes a quantitative approach, which is described by [32] as “Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods”. It has the collection of numerical data to clarify a specific phenomenon. The first data collection method is using a questionnaire (survey). The questionnaire is designed by using Google forms application, therefore the responses are been given online, which is convenient for the participants of colleges of IT. The participants are students or academic staff from the three governmental universities in middle of Iraq. The link of the online questionnaire has been sent to the participants by using email and Facebook groups. To support the concept of mobile learning and to encourage the participants to use mobile learning at anytime and anyplace.

4. DATA ANALYSIS AND RESULTS

The obtained data from the questionnaire will be analyzed using AMOS software and SPSS software to obtain descriptive statistical figures, frequencies and mean. Using SPSS, the missing value, outliers, normality, multicollinearity and non-response bias will be checked [33]. The AMOS will be used to conduct the main analysis of this study. AMOS has three main stage. First is the confirmatory factor analysis. In this stage each variable will be examined for factor loading and achieving the indices. The second stage is the measurement model. In this stage, all the variables together will be checked for validity and reliability. The last stage is the structural model. In this study, the hypotheses testing will be conducted.

4.1. Outliers

Outliers are unique observations that are far from the centre (mean value) of the data [34]. Hair *et al.* [34] study suggested to check the boxplots of the variables to identify the outliers. The boxplot in this study were checked for all the variables. A total of 9 responses were identified as outliers and they were removed. Removing 9 responses makes the complete and usable responses 314 (323-9=314). The boxplots show that there is no outliers after removing the nine responses.

4.2. Normality

According to [34], [35], the normality can be checked using two methods. The first method is to check the skewness and kurtosis. It is widely accepted that value of skewness and kurtosis less than ± 2 are acceptable and lead to a conclusion that the data are normally distributed [36]. The second method is to examine the histograms of the variable. A normal distribution looks like a bell-shaped. In this study, the kurtosis and the skewness are presented in Table 1. The table displays the value of Skewness ranged between -.030 to -.525. These values are less than ± 2 . In addition, the values of Kurtosis ranged between -.415 and -1.128 which are below ± 2 . As it can be seen in Table 1, the data is normally distributed and to confirm the normal distribution.

Table 1. Normality analysis

Variable	Skewness< ± 2	Kurtosis< ± 2
Performance Expectancy	-.323	-.762
Effort Expectancy	-.374	-.536
Social Influence	-.182	-.680
Facilitating Condition	-.492	-.491
Personal Innovativeness	-.148	-.799
Satisfaction	-.310	-.415
Intention to Use	-.030	-1.128
Actual Use	-.138	-.921

4.3. Structural model

The third level of SEM-AMOS is the structural model. In this level, the hypothesis is tested and the r-square of the model is presented. Figure 1 displays the structural model of this research. The R-square of the dependent variable intention to use is 0.60 indicating that the independent variables such as PE, SI, satisfaction, personal innovativeness, FC, and EE, were able to explain 60% of the variation in intention to use. In addition, the R-square of actual use is 0.44 indicating that 44% of the variation in actual use can be explained by intention to use. These values of R-square are acceptable and considered excellent as pointed

out by Hair *et al.* [37], R-square value between 0.25 to 0.50 is considered good while R-square value between 0.50 to 0.75 are considered excellent. Figure 1 presents the structural model of this research. The mean score value was used to test the direct effect and moderation effect between the variables of this research. This is in line with several researchers such as [37]-[39] have used the mean to test the structural model.

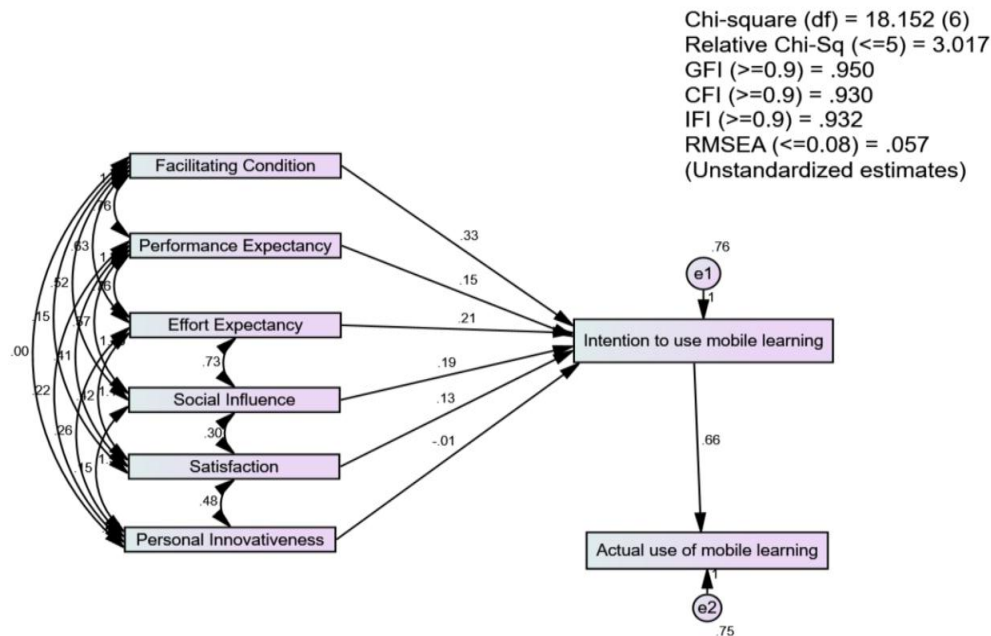


Figure 1. Structural model of direct effect

4.4. Hypotheses testing

The hypothesis of this study consists of seven direct effect hypotheses and three moderating hypotheses of experience. The following sections discuss first the direct effect hypotheses followed by the moderating effect of experience.

4.4.1. Direct effect

Seven direct effect hypotheses were developed in this research. Table 2 presents the findings of hypotheses testing for direct effect hypotheses. The table displays the hypothesis (H), dependent variable (DV), path, independent variable (IV), estimate (B), standard error (S.E.), critical ratio (C.R.) or t-value (T), and level of significance (P). A hypothesis is supported if the P or p-value and also known as level of significance is less than 0.05 or the C.R. is greater than 1.96 as suggested by [37], [38].

Table 2. Results of direct effect hypotheses

H	DV	Path	IV	Estimate (B)	S.E.	C.R.	P	Label
H1	ITU	<---	PE	.151	.049	3.097	.002	Supported
H2	ITU	<---	EE	.205	.049	4.217	***	Supported
H3	ITU	<---	SI	.195	.051	3.807	***	Supported
H4	ITU	<---	FC	.332	.058	5.728	***	Supported
H5	ITU	<---	PINN	-.014	.044	-.311	.756	Rejected
H6	ITU	<---	SA	.134	.048	2.771	.006	Supported
H7	AU	<---	ITU	.660	.042	15.812	***	Supported

Note: ***significance at the level of 0.001.

Note: ITU: intention to use, PE: performance expectancy, SI: social influence, SA: satisfaction, AU: actual use, PINN: personal innovativeness, FC: facilitating condition, EE: effort expectancy.”

All hypotheses are supported because P value is less than 0.05 or the C.R. is greater than 1.96. Only H5 is rejected because the P value (0.756) is greater than 0.05 and CR (-0.311) is less than 1.96. This means the personal innovativeness factor is not important and rejected in this study.

4.4.2. Moderating effect of experience

The data was divided into high and low experience. Two datasets were extracted based on the mean score. In addition, two models were created; constrained and unconstrained. The following sections discuss the moderating effect of experience between PE, EE, and SI and intention to use mobile learning.

4.4.3. Moderating effect of experience between PE and ITU

The eighth hypothesis of this research predicted that experience will moderate the effect of PE on the intention to use mobile learning. The low and high experience data were examined. The findings of testing the moderating effect of both low and high experience showed the differences in the chi-square is more than 92 and it is greater than 3.84 and there is a moderating effect of both low and high experience between PE and intention to use mobile learning. Thus H8 is supported. To determine the type of the moderator, the paths were examined as shown in Table 3 and it is found that this moderator is partial. As it can be seen in Table 3, the effect of PE on ITU in low experience data is not significant. Thus, the moderation is partial.

Table 3. Type of moderator

Model	DV	Path	IV	Estimate	S.E.	C.R.	P	Label
Low experience	ITU	<---	PE	.119	.067	1.765	.078	Not Supported
High experience	ITU	<---	PE	.187	.071	2.616	.009	Supported
“H8: Experience is a moderating variable influencing the effect of performance expectancy on intention to use of mobile learning”								Supported

4.4.4. Moderating effect of experience between EE and ITU

The ninth hypothesis of this research expected that the effect of EE on ITU is moderated by experience. The hypothesis was tested, and findings show that the difference between chi-square of the two models (high and low) is more than 90 and this value exceed the recommended value of 3.84 indicating that experience has a moderating effect between EE and ITU. To determine the type of the moderation, the high and low path of experience were compared. It can be seen in Table 4 that both paths are significant indicating that the moderation is full. This confirms H9 that experience moderates the effect of EE on ITU.

Table 4. Type of moderator

Model	DV	Path	IV	Estimate	S.E.	C.R.	P	Label
Low experience	ITU	<---	EE	.205	.071	2.881	.004	supported
High experience	ITU	<---	EE	.216	.067	3.246	.001	Supported
“H9: Experience is a moderating variable influencing the effect of effort expectancy on intention to use of mobile learning”								Supported

4.4.5. Moderating effect of experience between SI and ITU

The tenth hypothesis of this research proposed that experience moderates the influence of SI on the intention to use. Low and high experience were tested. Result of the test shows the differences in the Chi-square is more than 75 and it is greater than 3.84. Thus, low and high experience have moderation effect between SI and ITU. The moderation of experience between SI and ITU is full. This is because the effect of SI on ITU in both models are significant as shown in Table 5. Thus, H10 is supported.

Table 5. Type of the moderator

Model	DV	Path	IV	Estimate	S.E.	C.R.	P	Label
Low experience	ITU	<---	SI	.158	.068	2.318	.020	Supported
High experience	ITU	<---	SI	.219	.078	2.796	.005	Supported
“H10: Experience is a moderating variable influencing the effect of social influence on intention to use mobile learning”								Supported

4.5. Final model of intention to use mobile learning in HEI in Iraq

The model produced by this work is based on the analysis findings of data collection of the survey. After testing, the final model has five factors which are “facilitating conditions”, “performance expectancy”,

“effort expectancy”, “social influence”, and “satisfaction”, which have positive influence on intention to use of mobile learning. See Figure 2 model of intention to use mobile learning.

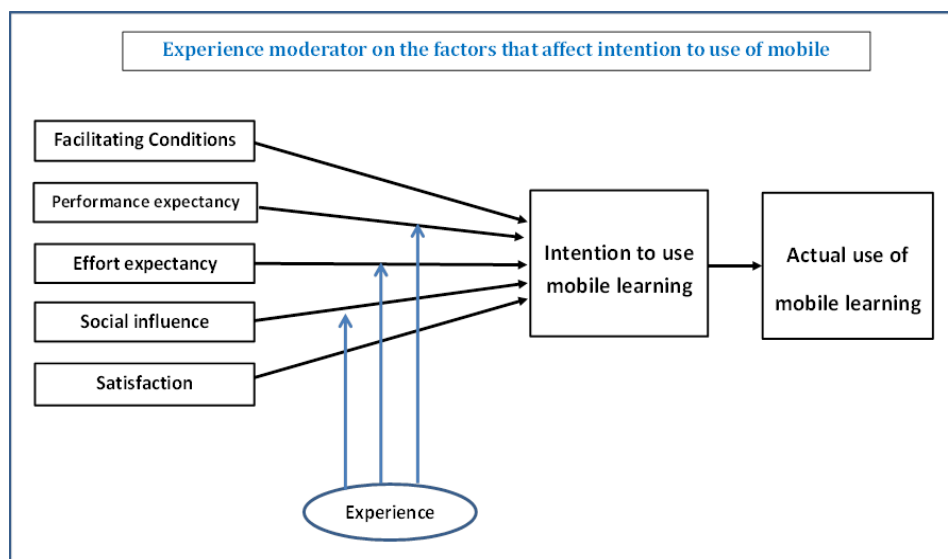


Figure 2. Final model of intention to use mobile learning

5. CONCLUSION

After data analysis, the result of this study discovered that only five factors are influencing intention to use mobile learning in HEI, the factors are “facilitating conditions”, “performance expectancy”, “effort expectancy”, “social influence”, and “satisfaction”. In addition to that the study confirmed that intention to use mobile learning influencing actual use of mobile learning in HEI. Moreover, the study discovered that experience is a moderating variable influencing the effect of each of “performance expectancy”, “effort expectancy”, and “social influence” on intention to use of mobile learning in HEI. While this research has discovered that the personal innovativeness factor is not important and rejected. This study has important contributions to universities in the area of mobile learning field by presenting a model of mobile learning that could be used as reference for mobile learning at the higher education level. It is recommended for motivating users and enhancing social sense of mobile learning adopters, giving them with some options is suggested as follows. Suitable time arrangement and good management of application environment, potentiality of content printing and transmit by the method of application itself, potentiality of control all issues of the system while running, the existence of a stable available menu for learners, support the information and content with videos, sounds, images and expanding necessary designing educational information and content would address aesthetic criterions. The future studies could extend the research to explore other potential factors for example quality of services and personal innovativeness in future models in order to convey a comprehensive perception of customers' acceptance and use of mobile learning continually.

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