

Using M-learning During Quarantine for Saudi Students: the Case of Northern Border University Students

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Summary

This study aims to measure the extent of acceptance by students of the Northern Borders University in the Kingdom of Saudi Arabia to learn using a mobile phone, with the development taking place in information technology, the broad and rapid spread of mobile internet, and the contribution of mobile in distance learning. A sample approved the UTAUT model of 350 male and female students from the University of Northern Borders who answered a questionnaire prepared to test 15 hypotheses based on the UTAUT model. The results of this study indicated that there was a positive and moral effect of both expected performances, expected effort, social dimension, and enjoyment during education on behavioural intention, and negative effect of self-learning on behavioural intention contrary to what expected. Moreover, the effects of the social and fun dimension perceived on the behavioural intention were noticeable, but no gender and age differences were found. The small screen and the difficulty of the mobile keyboard are among the biggest obstacles that prevent the development of mobile phone learning. The use of a mobile phone to learn under certain conditions such as quarantine is a new matter, which would improve the field of mobile phone learning in the future.

Keywords:

UTAUT Model, information technology use, M-Learning, Blackboard, Quarantine.

1. Introduction

The use of information and communications technology (ICT) improves learning, especially if strict instructions for its application accompany it, and perhaps the recent technological transformation, which resulted in improving the speed of the flow of the Internet. The emergence of portable smart devices, which resulted in distance learning, after the development of what known By learning via the Internet, the so-called mobile learning (M-learning) emerged, which revolutionized the field of information and communications technology for the ease of use of a mobile phone compared to a laptop.

The education was relied on by the phone by a group of universities, especially in the professional programs. In which the duration of the study is short. Moreover, it proved useful for corporate employees due to the limited time and difficulty of going to the university to receive lessons, and also in language schools. As the technology of mobile phone learning entered as Partial in academic programs. In order to facilitate the entry of students and the completion of homework and use, at the same time, travelling, it linked this technology to distance education. The Kingdom of Saudi Arabia has advanced in the field of what is known as distance education, and some universities have adopted distance learning programs so that the student studies all his lectures remotely and also tests online.

With the emergence of the Corona Virus Pandemic (COVID-19), the Ministry of Education in the Kingdom of Saudi Arabia announced, in cooperation with the higher authorities, a decision to suspend studies in all schools and educational institutions that include private and public universities and colleges. The resolution also includes both the educational body and the administrative body, as part of preventive measures The epidemic. On the other hand, the Ministry of Education directed all educational institutions to activate distance education during the period that will be included in the suspension of the study, so that the continuation of the educational process maintained through the electronic teaching methods provided by the ministry, which are approved by them in order to achieve effectiveness and quality as an exceptional alternative to the educational process. As the ministry provided all the approved means for distance education, in the universities circulated the blackboard platform through computers, smartphones and panels. The Northern Borders University was one of the universities that applied distance education in this exceptional period.

Do students of the University of Northern Borders accept using M-learning?

The importance of studying is the extent to which students accept the use of mobile learning, for ease of use. Moreover, to provide it to all segments of society, as the mobile phone is available to almost every adult in the

family. Therefore, the results of this study are essential for all members of society who are interested in education, which may contribute to these results in the development of educational technology via mobile phone.

The results of this study indicated that there was a positive and moral effect of both expected performance, expected effort, social dimension, and enjoyment during education on behavioural intention, and negative effect of self-learning on behavioural intention contrary to what expected. Moreover, the effects of the social and fun dimension perceived on the behavioural intention were noticeable, but no gender and age differences found. The small screen and the difficulty of the mobile keyboard are among the biggest obstacles that prevent the development of mobile phone learning. The use of a mobile phone to learn under certain conditions such as quarantine is a new matter, which would improve the field of mobile phone learning in the future.

This article divided into **First:** Introduction, **Second:** Previous studies, **Third:** Background and Model, **Fourth:** Research methodology, **Fifth:** Discussion, and **finally** Conclusion, limitations, Practical and social implications, and prospects for research and recommendations that decision-makers in Saudia can develop distance learning in its universities.

2. Literature review

Previous studies on E-Learning and M-Learning have each had a different area of interest and a different focal point:

Boateng, R. et al. (2016) study entitled Determinants of e-learning adoption among students of developing countries, used a quantitative research approach comprising of a survey of 337 students was adopted. Data were collected using questionnaires designed in conjunction with 13 factors (computer self-efficacy (CSE), perceived ease of use (PEOU), perceived usefulness (PU) and attitude towards use (ATTU)) in the conceptual model of the study. Data analysis was conducted using structural equation modelling and concluded demonstrated that some of the constructs used had either a direct or indirect effect on university students' ELIB. Based on this, there is a need for a practical application of the result of the study. In the development and management of e-learning in universities.

Alotaibi, M. B. (2013) study entitled; "Determinants of Mobile Service Acceptance in Saudi Arabia: A Revised UTAUT Model". Proposed a theoretical framework based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model, and The results suggest that behavioural intentions towards the use of M-Tadawul can

predict by performance expectancy, effort expectancy, social influence and M-Tadawul characteristics. The findings also indicate that the effect of predicting variables mediated by gender, age and education. I am studying the moderating impact of training in developing countries as well as applying heuristics evaluation of mobile services in Saudi Arabia would, therefore, merit further investigation.

Al-Hujran, O. et al. (2014) study entitled; "Get Ready to Mobile Learning": Examining Factors Affecting College Students' Behavioral Intentions to Use M-Learning in Saudi Arabia. This paper aims at examining the main factors affecting the adoption intention of Mobile Learning (M-Learning) based on the Unified Theory of Acceptance and Use of Technology (UTAUT) given the significance and power of such a theory in the field of Information Systems (IS), and the results also show that Facilitating Conditions has no significant effect on the intention to use M-Learning. Further, the findings show that the developed model explains 62.4% of the variance in the adoption intention to use M-Learning.

Wang, Y. S. et al. (2009) study entitled Investigating the determinants and age and gender differences in the acceptance of mobile learning, and based on the unified theory of acceptance and use of technology (UTAUT), and the results indicate that performance expectancy, effort expectancy, social influence, perceived playfulness, and self-management of learning were all significant determinants of behavioural intention to use m-learning. We also found that age differences moderate the effects of effort expectancy and social influence on m-learning use intention. That gender differences reduce the impact of social importance and self-management of learning on m-learning use intention.

Venkatesh, V. et al. (2003) study entitled User acceptance of information technology: Toward a unified view, and based on the unified theory of acceptance and use of technology (UTAUT), The UTAUT thus provides a useful tool for managers needing to assess the likelihood of success for new technology introductions and helps them understand the drivers of acceptance in order to proactively design interventions (including training, marketing, ...) targeted at populations of users that may be less inclined to adopt and use new systems. The paper also makes several recommendations for future research including developing a deeper understanding of the dynamic influences studied here, refining measurement of the core constructs used in UTAUT, and understanding the organizational outcomes associated with new technology use.

Hashim, K. F., et al. (2015) study entitled adult learners' intention to adopt mobile learning: A motivational

perspective, This research measurement is approved because it focused specifically on understanding user's motivation to take e-learning as a medium of education. Furthermore, all items are measured using 7-point Likert scales ranging from 1 (strongly disagree) to 7 (strongly agree), and findings suggest that adult learners' intention to use m-learning is influenced by their cognitive, affective and social needs through attitude. This paper concludes by noting the theoretical and practical contributions.

Al-Shahrani, H. (2016) study entitled Investigating the determinants of mobile learning acceptance in higher education in Saudi Arabia, and used the UTAUT Model: collected from 1,207 undergraduate students at KKU, Saudi Arabia. Multiple linear regression administered to test the proposed hypothesis. The proposed model was supported and explained up to 52% of the variance in behavioural intention to use M-learning. The results indicate that performance expectancy, effort expectancy, and social influence were all statistically significant predictors of behavioural intention to use M-learning. Despite the high potential of mobile handheld devices to provide students and institutions with many benefits, such as study aids, accessibility to information, and universal communication, students may constrain by limited or no internet connectivity, limited screen size, short battery life, and low memory, all of which may dampen student interest in using M-learning.

Wang, H. Y., & Wang, S. H. (2010) study entitled User acceptance of mobile internet based on the unified theory of acceptance and use of technology: Investigating the determinants and gender differences, Based on the Unified Theory of Acceptance and Use of Technology Model (UTAUT), and using the structural equation modelling approach. He proposed empirical data mostly supported model. The findings of this study provide several crucial implications for m-Internet service practitioners and researchers.

Basak S.K., Wotto M., Bélanger P. (2020) study entitled international Students Gender Impact to Use Mobile Learning in Tertiary Education, Based on the Unified Theory of Acceptance and Use of Technology Model (UTAUT) in M-learning used by international students. The results revealed that male students got a higher impact on the performance expectancy (PE), social factors (SF), and facilitating condition (FC). Still, on the other hand, female students got an impact on PE and FC. Furthermore, female students got a significant impact on PE and SF on behavioural intention (BI). Gender is affecting EE and FC.

Hilao, M. P., & Wichadee, S. (2017) study entitled Gender differences in mobile phone usage for language learning, attitude, and performance, The use of a useful tool to support learning can be affected by the factor of gender. The findings demonstrated that male and female students did not differ in their usage, attitudes toward mobile phone uses for language learning as well as their learning performance at a significance level. Also, the constraints of using a mobile phone to learn include the screen and keyboard. They followed by the intrusiveness of SMS background knowledge, and limited memory of the mobile phone.

Hoi, V. N. (2020) study entitled Understanding higher education learners' acceptance and use of mobile devices for language learning: A Rasch-based path modelling approach, applying in this study the modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT). The results indicated the important roles of attitude and performance expectancy in predicting learners' behaviour intention and their usage of MALL. The facilitating condition found to have no direct effect on learners' usage of MALL, representing a departure from the literature.

3. Background and hypotheses

3.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

Do **Venkatesh et al. .2003** a technology acceptance model formulated by in "User acceptance of information technology: Toward a unified view". The UTAUT aims to explain user intentions to use an information system and subsequent usage behaviour. The theory holds that there are four fundamental constructs:

- performance expectancy.
- Effort expectancy.
- Social influence.
- Facilitating conditions.

The first three are direct determinants of usage intention and behaviour, and the fourth is a direct determinant of user behaviour. Gender, age, experience, and voluntariness of use posited to moderate the impact of the four critical constructs on usage intention and action. The theory was developed through a review and consolidation of the constructs of eight models that earlier research had employed to explain information systems usage behaviour (theory of reasoned action, technology acceptance model, motivational model, a method of planned behaviour, a combined approach of proposed behaviour/technology acceptance model, the model of personal computer use, diffusion of innovations theory, and social cognitive theory). Subsequent validation by

Venkatesh et al. (2003) of UTAUT in a longitudinal study found it to account for 70% of the variance in Behavioural Intention to Use (BI) and about 50% in actual use look [Figure 1](#).

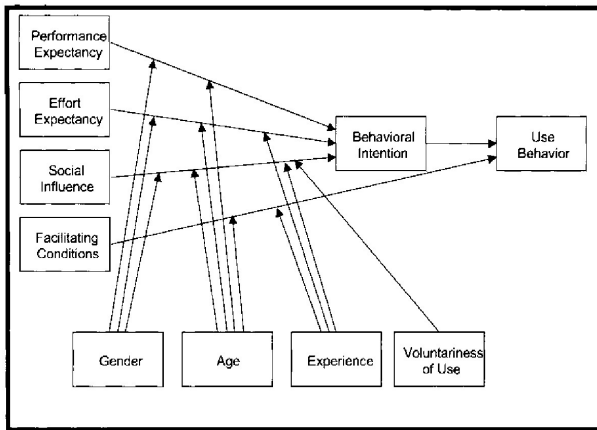


Fig 1 Unified theory of acceptance and use of technology model (UTAUT) Model. **Source:** Venkatesh, V., et al. (2003)

3.2 Research model and hypotheses

3.2.1 Model

The first to use the UTAUT model is the study of [Venkatesh et al. \(2003\)](#) on the use of information technology. He made several recommendations that would enable this model to apply to the use of smartphones in distance learning. So we use the study in the modified UTAUT model on the case to be studied which is the extent of acceptance Northern Border University students using mobile phone learning after the suspension of study in the Kingdom of Saudi Arabia due to quarantine, in order to cope with the epidemic of Crohnovirus (COVID-19). The UTAUT model changed in line with the study as in [Figure 2](#).

3.2.2 Hypotheses:

To answer the previous problem and achieve the desired research objectives, we propose the following set of hypotheses:

Performance Expectancy (PE)

H1: Performance expectancy has a positive effect on behavioural intention to use m-learning.

H2: Performance expectancy influences behavioural intention to use m-learning more strongly for men than for women.

H3: Performance expectation affects the behavioural impact on M-learning use more for less age.

Effort Expectancy (EF)

H4: Effort expectancy has a positive effect on behavioural intention to use m-learning.

H5: Effort expectancy influences behavioural intention to use m-learning more strongly for women than for men.

H6: Effort expectancy influences behavioural intention to use M-learning more strongly for the older age.

Social Influence (SI)

H7: Social influence has a positive effect on behavioural intention to use m-learning.

H8: Social influence influences behavioural intention to use M-learning more strongly for women than for men.

H9: Social influence influences behavioural intention to use M-learning more strongly for older age.

Perceived Playfulness (PP)

H10: Perceived playfulness has a positive effect on behavioural intention to use m-learning.

H11: Perceived playfulness influences behavioural intention to use m-learning more strongly for men than for women.

H12: Perceived playfulness influences behavioural intention to use m-learning more strongly at less age.

Self-management of Learning (SL)

H13: Self-management of learning has a positive effect on behavioural intention to use M-learning.

H14: Self-management of learning influences behavioural intention to use M-learning more strongly for men than for women.

H15: Self-management of learning influences behavioural intention to use M-learning more strongly for older age.

4. Research Methodology

In this section, we treat Measures and Data analysis and results.

4.1 Measures

The analogy was based on the questionnaire of a popular community, students of the Northern Borders University in the Kingdom of Saudi Arabia, and distributed it to a group of 350 students (including 120 Male and 230 Female) and their answers were mixed. A group of questions as asked, divided as shown in [Figure 2](#): Performance Expected (PE), Effort Expected (EE), Social Impact (SI), Perceived playfulness (PP) and self-management of learning, and used Likert scale (1-5), whose responses range from "Strongly Agree" to "Strongly Disagree", ere used for all building elements. [Appendix 1](#) lists the original elements used in this questionnaire.

4.2 Data analysis and results

4.2.1 Descriptive Analysis

The questionnaire as distributed to a group of students, and the answers received from 303 students, 85% use the mobile phone to learn during the quarantine period. The results are as shown in **Table 1** below:

Table 1: Characteristics of the respondents

Characteristic	Number	Percentage
Gender :		
Male	120	34.3
Female	230	65.7
Age :		
<18	3	0.9
18-20	130	37.1
20-22	170	48.6
>22	47	13.4
Speciality :		
General setting	74	21.1
Law	130	37.1
Accounting	48	13.7
Financing and insurance	31	8.9
Human Resources	60	17.1
Marketing	7	2
The device used for learning:		
Mobile/Tab	306	87.4
Laptop	44	12.6

Source: From the respondents' answers.

4.2.2 Measurement Model Analysis

Reliability and Validity Analysis of Measures

Cronbach's Alpha coefficient used to test the internal consistency of each building. Alpha Cronbach values above the recommended 0.60 thresholds (**Bagozzi and Yi, 1988; Fornell and Lacrker, 1981**) ranged from 0.66 to 0.94 for all constructs, as shown in **Table 2**, lending to support the internal consistency of the elements under each underlying construction.

Table 2: Test Reliability of Questionnaire

Number of elements	Cronbach's Alpha
6	0.936

Source: Output SPSS

In this study, Cronbach's Alpha statistic in global is 0.936 (<0.94); this means that the data is acceptable and reliable, which helps to obtain good results.

Statistics Descriptive of Model

Moreover, It is also acceptable in all study variables, as shown in **Table 3**. It also displays the Moyenne and Standard deviation for each variable.

Table 3: Total Items Statistics

	Min	Max	Moyenne	Sd.dev
Gender	0	1	.34	0.475
Age	1	4	2.75	0.692
SL	1	5	3.6165	1.13493
PP	1	5	3.7507	1.12968
SI	1	5	3.7301	0.93710
EE	1	5	3.5597	0.96519
PE	1	5	3.9737	.92711
BI	1	5	3.7102	1.32500

PE: performance expectancy; EE: effort expectancy; SI: Social Influence; PP: Perceived Playfulness; SL: Self-management of Learning; BI: Behavioural Intention. Source: Output SPSS

After collecting and arranging the data, each group was combined into one variable to control the study variables, where we had ten variables, including necessary variables that were directly affected in the model and indirectly affected variables, and the results were as shown in **Table 4**.

Table 4: Regression Weights

	Estim	S.E.	C.R.	P
BI - PE	0.206	0.074	2.802	0.005
BI - EE	0.223	0.078	2.865	0.004
BI - SI	0.294	0.077	3.835	0.001
BI - PP	0.46	0.074	6.207	0.001
BI - SL	-0.021	0.064	-0.334	0.738

Source: Output AMOS

In **Table 5**, which represents the correlation matrix between variables, we observe that there is no correlation between the variables of the model, this increases the accuracy of the model, which uses the best linear unbiased estimators.

Table 5: Inter-item correlation matrix

	SL	PP	SI	EE	PE	BI
SL	1					
PP	0.673	1				
SI	0.593	0.742	1			
EE	0.679	0.748	0.785	1		
PE	0.652	0.754	0.757	0.85	1	
BI	0.578	0.755	0.731	0.745	0.739	1

PE: performance expectancy; EE: effort expectancy; SI: Social Influence; PP: Perceived Playfulness; SL: Self-management of Learning; BI: Behavioural Intention.

Source: Output AMOS

The goodness of Test results for Measurement Models

The goodness of fit (GOF) indices for the measurement models for all constructs shown in Table 6. In fact, several (GOF) indices were used to assess the confirmatory factor analyses and structural equation models. We select the following indices following [MAMECHE, Y. et al., 2020](#): RMSEA (Root Mean Square of Error Approximation), NCP (an estimate of the Decentralization parameter), CMIN/DF (the minimum discrepancy divided by its degrees of freedom), FMIN (is the minimum value, F, of the discrepancy), AIC and ECVI (consistent AIC) [Bozdogan, 1987](#).

Table 6: Goodness of Fit Statistics

	Global	Gender	Age
RMSEA	0.59	0.50	0.496
CMIN/DF	121.99	89.89	87.39
NCP	1814.87	1866.86	1814.36
FMIN	5.12	5.38	5.23
AIC	1853.87	1915.86	1863.35
ECVI	5.28	5.45	5.31

4.2.3 Structural Model Analysis: Test of Hypotheses

The UTAUT model approved by [Venkatesh et al. \(2003\)](#), and some adjustments made that are compatible with the study, which focused on the extent of the acceptance of students from the University of Northern Borders on mobile phone learning, and the indicators included in the original form were adapted, and some indicators adapted to the rest of the variables. It adopted in that On [Wang, Y. S. et al. \(2009\)](#), who applied the original UTAUT model to mobile learning to employees who wanted to use this method to improve their level of education. It provided conclusive evidence of the strength and quality of the model, which facilitated the identification of determinants, and its impact on both sex and age, on distance learning using a mobile phone at the Northern Frontier University in Saudi Arabia.

Figure 3 illustrates the normative path criteria in the proposed study model, where hypotheses 1, 4, 7, 10, and 13 have adopted which measure the impact of expected performance, expected effort, social impact, and enjoyment during learning and self-management in learning on the behavioural intention to use a mobile phone in Learning. The results were of having a positive and moral effect for both expected performance, expected effort, social Influence and Perceived Playfulness on the behavioural intention in using the mobile phone in learning ($\beta = 0.21$, $\beta = 0.22$, $\beta = 0.29$, $\beta = 0.46$, respectively) and this is consistent with Study [Wang, Y. S. et al. \(2009\)](#), while self-management in learning variable was It hurts the behavioural intention in using a mobile

phone in learning ($\beta = -0.02$) contrary to what expected which is inconsistent with the study of [Wang, Y. S. et al. \(2009\)](#).

The study also confirmed that the model; in general is statistically acceptable, as 81.8% of the study variables explain the behavioural intention in using the mobile phone in learning. In addition to the existence of a difference in the use of mobile phone learning between the sexes, as the model is better for females than males, excluding males, we find that 71.5% of the study variables explain the behavioural intention in using the mobile phone in learning. In contrast, if we exclude the females, we find that 84% of the study variables explain the behavioural intention in using the mobile phone in learning. Track coefficients for expected performance, expected effort, social Influence, and Perceived Playfulness were all critical for the male class on one side and the female class on the other hand, while self-management in learning was unimportant to both categories and **Figure 4** illustrates this.

As for effect with regards to the age of the students, a difference observed between the age groups. The best category for the model was between the ages of 20 and 22, since 84.7% of the study variables explain the behavioural intention in using the mobile phone in learning, followed by the group over 22 years, 77.9% of The study variables explain the behavioural intention in using the mobile phone in learning. The group between the ages of 18 and 20 years since 76% of the study variables explain the behavioural intention in using the mobile phone in learning. Finally, the group under the age of 18 was 72% of the study variables explaining the behavioural intention in using the mobile phone in learning, as the study demonstrated that the path parameters for both expected performance, expected effort, social impact and enjoyment during learning are all critical for the four age groups. In contrast, self-management in Learning was unimportant to both groups, and **Figure 5** illustrates this.

5. Discussion

This paper conducted a pilot evaluation of the extent of acceptance by students of the Northern Border University for mobile learning; a hypothetical model was developed by including 24 comprehensive indicators that were assigned five critical indicators. The measurement model was tested experimentally by SEM using data gathered from 350 respondents from students in different disciplines. The results provide sufficient evidence of students acceptance of mobile learning about the following five indicators: expected performance, expected effort, social impact, and enjoyment during learning and self-management, which are the determinants of mobile

learning, in addition to behaviour that differs in gender and ages, see [Table 7](#). We can also divide the obtained results into three components:

5.1 Determinants of M-learning Acceptance

The results of this study indicated that there was a positive and moral effect of both expected performance, expected effort, social dimension, and enjoyment during education on behavioural intention, which was consistent with Wang's study [Wang, Y. S. et al. \(2009\)](#), and the negative effect of self-learning on behavioural intention contrary to what expected, which is inconsistent with Wang's study [Wang, Y. S. et al. \(2009\)](#). The results show in [Table 4](#).

Effect Performance Expectancy on behavioural intention

The probability of getting a critical ratio as large as 2.802 in absolute value is 0.005. In other words. The regression weight for Performance Expectancy (PE) in the prediction of Behavioural Intention (BI) is significantly different from zero at the 0.01 level, The effect of Performance Expectancy (PE) on of Behavioural Intention (BI) is 0.21 That is, due to both effects of PE on BI, when Performance Expectancy goes up by 1, Behavioural Intention goes up by 0.206.

Effect Effort Expectancy on behavioural intention

The probability of getting a critical ratio as large as 2.865 in absolute value is 0.004. In other words, the regression weight for EE in the prediction of BI is significantly different from zero at the 0.01 level. The effect of EE on BI is 0.223. That is, due to both effects of EE on BI, when EE goes up by 1, BI goes up by 0.223.

Effect Social Influence on behavioural intention

The probability of getting a critical ratio as large as 3.835 in absolute value is less than 0.001. In other words, the regression weight for SI in the prediction of BI is significantly different from zero at the 0.001 level. The effect of SI on BI is 0.294. That is, due to both effects of SI on BI, when SI goes up by 1, BI goes up by 0.294.

Effect Perceived Playfulness on behavioural intention

The probability of getting a critical ratio as large as 6.207 in absolute value is less than 0.001. In other words, the regression weight for PP in the prediction of BI is significantly different from zero at the 0.001 level. The effect of PP on BI is 0.460. That is, due to the effect of PP on BI, when PP goes up by 1, BI goes up by 0.46.

Effect Self-management of Learning on behavioural intention

The probability of getting a critical ratio as large as 0.334 in absolute value is 0.738. In other words, the regression weight for SL in the prediction of BI is not significantly different from zero at the 0.05 level. The effect of SL on BI is -0.021. That is, due to the effect of SL on BI, when SL goes up by 1, BI goes down by 0.021.

5.2 Gender and Age Differences

We found that the effects of the social and fun dimension perceived on the behavioural intention were noticeable. However, no gender or age differences found, and this is what indicates that the average performance of the social and fun dimension towards the use of mobile learning has a higher intention to use mobile learning than those with Weak social dimension and conceptual perception.

More importantly, the results indicate that there are some significant differences between the sexes and age in terms of the effects of determinants on behavioural intent. Firstly, the age group between 20-22 students, whether male or female. Is more receptive to learning via mobile phone than other groups as this group is mostly in advanced stages of their studies (about to graduate), which increases their eagerness to learn in various ways in preparation for their obtaining jobs after graduation From the university. Also, to the state policy focusing on graduates to employ them after graduation in positions that can contribute to raising the national economy [Louail, B., & Riache, S, \(2019\)](#). Likewise, students who are advanced in their studies prefer their learning via mobile phone because of its ease, given that a large number of them are housewives and aspire to develop their learning without neglecting their families, in addition to their chances of employment in the Kingdom of Saudi Arabia increased after the government supported the initiative to empower women.

Second, it was an unexpected and exciting result of this study. That the effect of mobile self-learning on behavioural intent was noticeable for students, unlike female students, and this research is inconsistent with a study ([Morris & Venkatesh, 2000; Venkatesh et al., 2000](#)) is familiar Women are more interested in self-learning than men, especially if it comes to mobile learning, so they leave this point for future research. It has also unexpectedly found that self-management of learning is a more potent determining factor in women's intent compared to men, and this determination seemed to be contrary to the view suggested by [Beck, A. T. \(1983\)](#), who suggested men were more likely to be subjected to self-Bedouin than women.

Finally, it also obtained unexpectedly that the self-learning of the younger ones is higher than that of, the older ones, contrary to what [Wang, Y. S. et al. \(2009\)](#)

concluded, which is evidence that young people are more used to the mobile phone and therefore using it to learn makes it easier for them.

6. Conclusion

The results of this study indicated that there was a positive and moral effect of both expected performance, expected effort, social dimension, and enjoyment during education on behavioural intention, and negative effect of self-learning on behavioural intention contrary to what expected. Moreover, the effects of the social and fun dimension perceived on the behavioural intention were noticeable, but no gender and age differences found.

There is a set of difficulties that may face education via mobile phone: that the mobile phone screen is rather small, which makes it difficult to focus on the part of users for a long time. Using a mobile phone keyboard is difficult and impractical compared to a computer.

The challenges to face the deficiencies of mobile learning are: that the developers of the mobile learning system must improve the ease of use of the user interface through the touch screen, the introduction of open data, handwriting recognition, and even the voice recognition mechanism. It will make people easily understand the learning system for their future adoption. It must also provide a distinct level of the education system over the phone to match its output, which is students—providing content that meets the needs of users and designing it in a way that is easy to use. In addition to creating a stimulating environment to encourage cooperation between researchers in the field of distance learning, and the teachers and developers who use that education, to improve and develop it.

Moreover, like other research, this research contains shortcomings that can be prospects for future research that can complement the shortfall that came in it.

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Table 7: Summary of testing results

	Relationship	Est.Coeff	Hypothesis	Testing result
Main effect				
H1	PE–BI	0.21**	Positive	Supported
H4	EE–BI	0.22**	Positive	Supported
H7	SI–BI	0.29***	Positive	Supported
H10	PP–BI	0.46***	Positive	Supported
H13	SL–BI	-0.02	Negative	Not Supported
Gender difference				
H2	PE–BI	0.2024***	Male>Femal	Supported
H5	EE–BI	0.2252***	Femal>Male	Supported
H8	SI–BI	0.2988****	Femal>Male	Supported
H11	PP–BI	0.4636****	Male>Femal	Supported
H14	SL–BI	-0.0328	Male>Femal	Not Supported (Femal>Male found)
Age difference				
H3	PE–BI	0.2003***	the youngest	Supported
H6	EE–BI	0.2292***	the oldest	Supported
H9	SI–BI	0.2801****	the oldest	Supported
H12	PP–BI	0.4636****	the youngest	Supported
H15	SL–BI	-0.0188	the oldest	Not Supported (the youngest found)

H: Hypothesis; PE, performance expectancy; EE: Effort Expectancy; SI: Social Influence; PP: Perceived Playfulness; SL: Self-management of Learning; BI: Behavioural Intention. (**** 0.1%, *** 1%, ** 5%, * 10%).

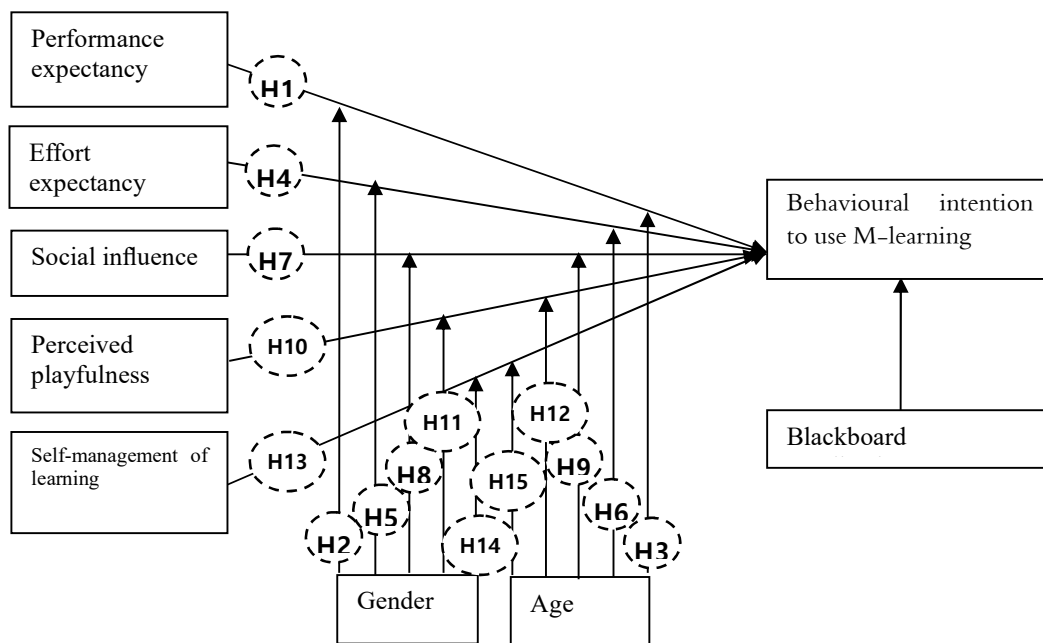


Fig 2. Modified UTAUT Model for M-learning in this study

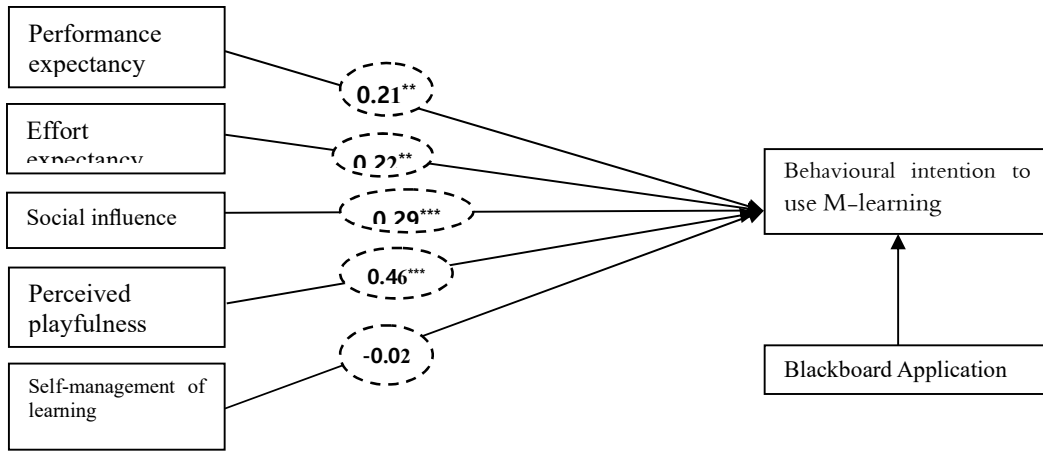


Fig 3. Standardised path coefficients for all respondents (*p < 0.05; **p < 0.01; ***p < 0.001).

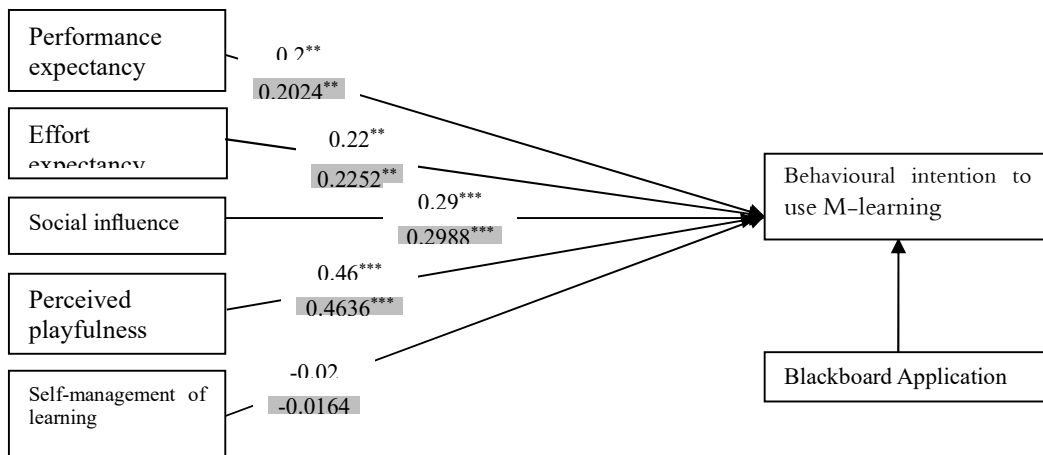


Fig 4. Standardised path coefficients for males and females (*p < 0.05; **p < 0.01; ***p < 0.001).

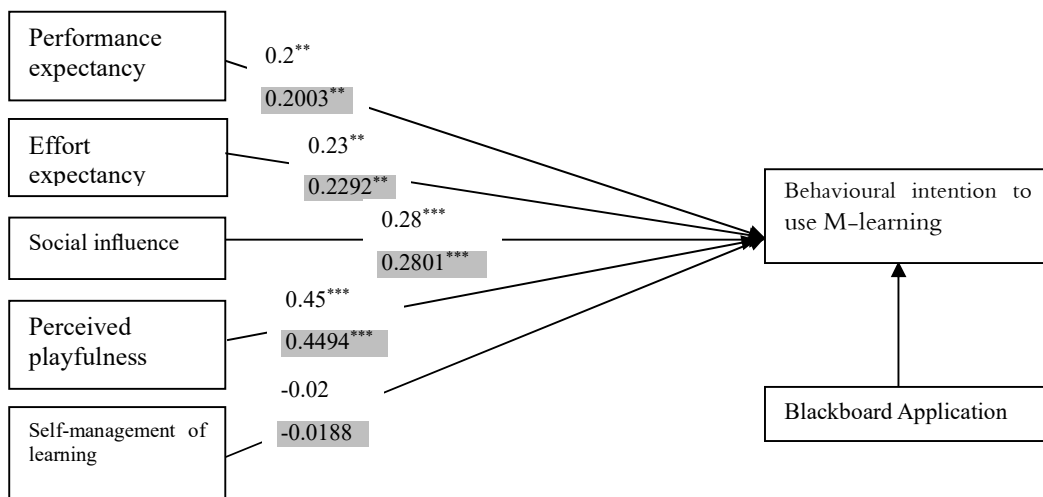


Fig 5. Standardised path coefficients for younger and older people (*p < 0.05; **p < 0.01; ***p < 0.001).