

# Mobile Learning Adoption in Saudi Arabia

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**Abstract**—This paper investigates the use of mobile phones and tablets for learning purposes among university students in Saudi Arabia. For this purpose, an extended Technology Acceptance Model (TAM) is proposed to analyze the adoption of mobile devices and smart phones by Saudi university students for accessing course materials, searching the web for information related to their discipline, sharing knowledge, conducting assignments etc.

**Keywords**—Saudi Arabia, TAM, Mobile learning, e-learning, smart phones.

## I. INTRODUCTION

MOBILE services are increasingly spreading and dominating many aspects of our life worldwide. Recently, the kingdom of Saudi Arabia is reported as the country with the highest percentage of mobile phone users in the whole globe. The reported statistics indicate significantly increasing trends among teenagers towards adopting mobile services for use with the internet applications. Mobile use can offer great opportunities for improving teaching and learning processes among young students. However the benefits gained from mobile services depend on the intention of students to use them for educational purposes. Technology Acceptance Model (TAM) which was originated in the area of information systems, has been widely used to examine examines the perceived usefulness and perceived ease of use as correlated with people's intention to use a system or technology [1]. Recently, (TAM) has been one of the popular research tools that can help to investigate such intention and further identify the driving and motivating factors for accepting different technologies [2].

Reference [3] used the survey questionnaire method to identify factors that influence Hong Kong university students' adoption of technology for learning. They also investigated the relationships between these factors. The factors reported as dominant predictors of students' technology use for learning are: the compatibility of technology and students' learning styles and needs, the availability of encouragement and supports from peers and teachers, and the attitudes toward technology use. Reference [4] conducted a survey based study to investigate the critical factors affecting learners' satisfaction in e-Learning. They reported learner computer anxiety, instructor attitude toward e-Learning, e-Learning course flexibility, e-Learning course quality, perceived usefulness, perceived ease of use, and diversity in assessments as the critical factors affecting learners' perceived satisfaction.

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Reference [5] presented a framework of a contextual mobile learning system for Saudi universities environment. The proposed system aims to help the students to learn in their daily lives using mobile computing devices like Tablet PCs and Smart Phones. Reference [6] used qualitative approach and focus group of students to explore student's recent experiences of m-Learning at a small HE institution in Thailand. Their results suggest that there are crucial technological constraints that have to be overcome regarding mobile devices, the media used and the effects of the delivery mechanism. For more studies on the adoption of m-learning, interested readers are referred to [7], [8] and [9]

The reviewed literature have provided important insights into mobile learning adoption, but the issue still needs to be examined from other directions such as the innovativeness and anxiety and other external cultural factors. As mentioned earlier in this paper, the kingdom of Saudi Arabia is reported as the country with the highest percentage of mobile phone users in the whole globe. In spite of this wide adoption of mobile phones, there is no published research to investigate the adoption of m-learning among Saudi college students. This paper fills the gap in the literature by extending the classical TAM by adding the perceived ICT innovativeness and anxiety relates to Saudi students' behavioral intention to use smart phones and tablets for educational purposes.

## II. METHOD

This study is based on an extended TAM. TAM is selected based on its excellent reputation in terms of robustness and explanatory power (Liu et al., 2010). For more information on TAM interested reader is referred to Davis (1989) and Chun and Yang (2011). The extended TAM consists of the dimensions depicted in Fig. 1.

### *Hypotheses*

Based on the the extended TAM depicted in Fig. 1, the following hypotheses are proposed.

- H1: Perceived innovativeness positively relates to perceived ease of use of m-learning.
- H2: Perceived innovativeness positively relates to perceived usefulness of m-learning.
- H3: Perceived innovativeness positively relates to behavioral intention to use m-learning.
- H4: Perceived ICT anxiety positively relates to ease of use of m-learning
- H5: Perceived ICT anxiety positively relates to perceived usefulness of m-learning
- H6: Perceived ICT anxiety positively relates to behavioral intention to use m-learning.

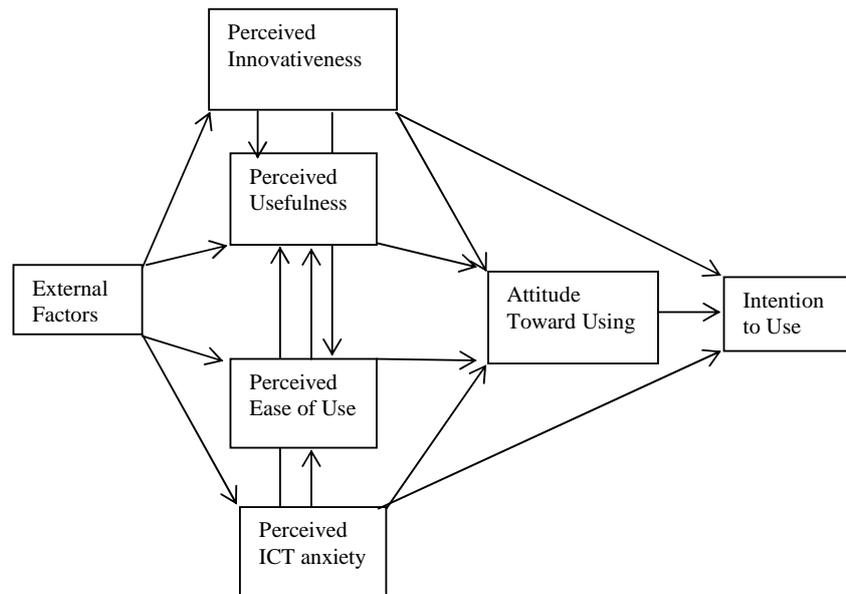


Fig. 1 The extended TAM

### III. DATA COLLECTION

A survey questionnaire was used to collect data. The scales used in the questionnaire were adopted from previous studies (Liu et al., 2010). The questionnaire constructs were measured based on five-point Likert-scales ranging from strongly disagree (1) to strongly agree (5). The questionnaire was administered to 60 male students from a college computer science and information technology. Later, 55 valid filled questionnaire forms were used for the analysis.

### IV. ANALYSIS AND RESULTS

The descriptive statistics for the variables are displayed in Table 1. The perceived innovativeness has the highest average 44.4, which indicates that surveyed students like exploring immersing ICT technologies and new features of mobile devices. The second highest average is reported for perceived ease of use 4.29, indicating that students are familiar with using mobile phones. The students' intention to use m-learning is high having an average of 4.01.

To test internal consistency and reliability of the five-point scale used in the survey, Cronbach's alpha is calculated and presented in Table 2. The Alpha coefficient values of the reliability test for all constructs range from 0.716 to 0.875 showing good level of internal consistency.

Construct	Mean	Standard deviation
Perceived innovativeness	4.44	0.59
ICT anxiety	4.02	1.06
Perceived ease of use	4.29	0.53
Perceived usefulness	4.13	0.66
Attitude toward using	3.94	0.79
Intention to use	4.01	0.71

Construct	Cronbach's Alpha
Perceived innovativeness and ICT anxiety	0.716
Perceived ease of use	0.743
Perceived usefulness	0.767
Attitude toward using	0.800
Intention to use	0.875

At this stage of the research, Pearson correlation analysis is adopted to test the six TAM hypotheses presented in the previous section. Based on the application of SPSS software, the Pearson correlation coefficients are summarized in Table 3. In view with these results, only one hypothesis supported with low correlation value (H3: Perceived innovativeness positively relates to behavioral intention to use m-learning). Conflicting with finding from previous studies (Liu et al., 2010), perceived innovativeness does not show high positive correlation with perceived usefulness of m-learning.

TABLE III  
CORRELATION MATRIX OF THE MODEL FACTORS

Construct	Perceived innovativeness	ICT anxiety	Perceived ease of use	Perceived usefulness
Perceived innovativeness	1	0.671* *	0.290*	0.101
ICT anxiety	0.671**	1	0.211	0.014
Perceived ease of use	0.290*	0.211	1	0.686**
Perceived usefulness	0.101	0.014	0.686**	1
Intention to use	0.306*	0.171	0.521**	0.704**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## V.CONCLUSION

This paper is intended to examine the use of mobile phones and tablets for learning purposes among university students in Saudi Arabia. For this purpose, an extended Technology Acceptance Model (TAM) is proposed to analyze the use of mobile devices and smart phones by Saudi university students for accessing course materials, searching the web for information related to their discipline, sharing knowledge, conducting assignments. Findings from preliminary analysis indicate that perceived innovativeness does not show high positive correlation with perceived usefulness of m-learning. Several limitations in this study should be considered in future research. First, the study only considered the intention to use m-learning among male students. We further need to include female students in our sample. Also, the sample consists of students from only one college. In our preliminary analysis, we only applied simple correlations analysis. The structural model method will be applied in the next research stage.

## ACKNOWLEDGMENT

The authors would like to acknowledge the support for this research provided by King Faisal University.

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IJOPCD 2.1 (2012): 65-82. Web. 9 May. 2012.  
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