

## PREDICTORS OF ACCEPTANCE OF MOBILE TECHNOLOGY FOR LEARNING AMONG STUDENTS OF NATIONAL OPEN UNIVERSITY OF NIGERIA (NOUN) IN NORTH CENTRAL NIGERIA

Gana Abraham Sha'aba\*  
Email: [abagny31@yahoo.com](mailto:abagny31@yahoo.com)  
Shittu, Ahmed Tajudeen (PhD)\*  
Email: [t.shittu@futminna.edu.ng](mailto:t.shittu@futminna.edu.ng)

Dr. (Mrs) C. C. Nsofor (PhD)\*  
Dr. I. I. Kuta (PhD)\*  
\*Department of Educational Technology  
Federal University Technology, Minna

### Abstract

*This study investigated the predictors of acceptance of mobile technology for learning among students of National Open University of Nigeria (NOUN) in North Central Nigeria. The research design adopted for this study was descriptive survey design. The population for this study was 353 NOUN students. The instrument used for data collection was PAMTL questionnaire which was developed by the researcher. The instrument was validated by experts for face and content validity. To determine the reliability of the instrument, the questionnaire was subjected to pilot test to ascertain its reliability using Cronbach Alpha and found to be reliable (0.7). The data obtained from the questionnaires were analyzed using Regression Analysis. The finding revealed that performance expectancy, effort expectancy, social factors have positive influence on attitude towards mobile technology for learning. Based on this finding, it was recommended that students should be encouraged to develop positive attitudes towards the use of mobile technology for learning.*

**Keywords:** Performance Expectancy, Effort Expectancy, Social Factors and Attitude.

### Introduction

As Nigeria is motivated to meet with the vision 20:20 development, there is necessity for an excellent acquisition of skills, techniques, processes and methods that are fully embedded in Science and Technology. This should be done to enable the nation's social-economic growth to improve and pave way for Nigeria to tag along with the rest of the world in the areas of technological growth and advancement. No doubt that the modern world is dominated by technology and brought series of innovations across many sectors globally. Technology has dramatically changed the world by altering a number of environments and facilities including home, work, healthcare facilities and education thereby giving rise to various technological possibilities. (Czaja & Lee, 2007). The invention of the computer and internet now allows possibilities that were once unimaginable as in remote teaching and learning, and online social support. Such technological possibilities are related to the overall well-being of students, particularly regarding their education and independence (Mitzner et al., 2010). Defining technology can be particularly challenging for researchers as technology can include an array of inventions ranging from vehicles to cell phones.

Technology is the collection of techniques, skills, methods and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation (Huesemann, 2011). Technology can be the knowledge of techniques, processes, and others or it can be embedded in machines, computers, devices and factories, which can be operated by individuals without detailed knowledge of the workings of such things (Teich, 2008). Technology has many effects, it has helped develop more advanced economies (including today's global economy) and has allowed the rise of a leisure class. Various implementations of technology influence the values of a society and education (Mumford, 2010).

Based on this definition, questions regarding technologies that promote education (e.g., internet use) and leisure time (e.g., social network and internet use) are related to quality of life as students may obtain enjoyment from using such technologies. Such technologies include mobile technologies. The revolution brought about by mobile technologies has resulted to the emergence of mobile learning, which is the

extension or prolongation of e-learning. (Hvorecky, 2002) described mobile-learning as a learning process which takes the advantages of mobile devices, ubiquitous communications technology and intelligent user interfaces. In universities, mobile learning helps educational institutions to enhance the accessibility, interoperability and reusability of educational resources, and also to improve flexibility and interactivity of learning behaviours at convenient times and places (Abrami et al, 2006). For learners in general, mobile learning facilitates the use of previously unproductive time, enables learning behaviours regardless of time and place, and brings about great possibilities for personalized, customized and context-aware learning support services (Irons, 2002).

Mobile learning is a method in which materials are delivered by mobile technology, such as mobile devices and wireless networks (Wang, Wu & Wang, 2009). Mobile learning contains the features of e-learning and the benefits of mobile technology, which include convenience, immediacy and expediency. Mobile learning is featured by mobility and ubiquity, so it becomes the next milestone of e-learning and educational technology (Peng, Su, Chou & Tsai, 2009). Mobile devices, such as PDAs ('personal digital assistants') and smart phones (Shih et al.2010) are portable and can be instant communication tools (Lea & Callaghan, 2011); (Chang & Chou, 2008). Wireless networks with functions of immediate connection and transmission (Chinnery, 2006) enable a learner's interactions with learning content, peers and instructors to foster a meaningful knowledge construction and to get the updated knowledge (Wang et al., 2009). Mobile technologies can help students interact with one another, collect and analyze data and get instant knowledge and messages in a learning environment.

Despite the availability of studies on mobile learning, its theoretical foundations have not yet matured (Glogoff, 2005). According to (Gay et al,2006), regardless of the high degree of insertion of mobile devices in current society, the mere availability of technology itself does not guarantee that its potential will be used for learning or accepted by all evenly. (Aviranetal, 2004) also stressed that, the understanding of the acceptance of mobile technologies in educational environments is still incipient and in particular, questions about how to promote the acceptance of mobile technology by users are still largely unresolved, most especially in the less developed nations.

According to Masrom and Hussein, (2008) UTAUT could explain up to 70% of technology acceptance behaviour (Masrom & Hussein, 2008) UTAUT suggests that four key constructs which are, performance expectancy, effort expectancy and social factors have a direct influence on intention to adopt technology. Such key factors are;

Performance expectancy is the strongest predictor of behavioural intention to use several technologies in both voluntary and involuntary settings (Venkatesh et al., 2003). In mobile technology context, it represents the degree to which students believe that using mobile technology will help to enhance their learning performance and gain better grades (Wang et al., 2009). Strengthening this belief will increase students' behavioural intention to adopt and use mobile technology. This construct has been driven from perceived usefulness described in TAM and TRA. A similar study conducted to elicit acceptance of mobile phones to deliver tutorial in Ghana using TAM found performance expectancy being a strong predictor (Adedoja, Adelore, Egbokhare, & (Oluleye, 2013).

Effort expectancy represents students' perception that using the mobile technology will be easy and free of efforts. Since many learners in developing countries are not exposed to many information systems (Ssekakubo, Suleman, & Marsden, 2011), this construct is an important determinant of mobile technology acceptance. It is expected that acceptance to adopt and use of mobile learning will depend on whether students believe using mobile technology will be ease of use (Wang et al., 2009).

Social influence represents the degree to which students perceive other students or important people believe they should adopt and use mobile learning (Venkatesh et al., 2003). Prior studies have demonstrated that a student's decision is normally influenced by peer students or by other people such as instructors and parents (Abu-al-aish & Love, 2013); (Miller, Rainer, & Corley, 2003). Therefore, it is important to include social influence as one of the constructs in the modified research model.

The model is specified using TAM as a theoretical foundation for the study. In sum, the model hypothesized that acceptance to use mobile technology for learning by the students can be explained by a number of factors postulated through Technology Acceptance Model of (Davis 1986).

(Ajzen & Fishbein, 1980) define attitude to "one positive or negative judgement about a concrete subject" and student confidence on mobile technology can be explained by the attitude and behaviour of their teachers (Yusuf & Balogun, 2011). Attitude was further explained to be a predisposition to respond favorably or unfavorably to an object or event (Ajzen, 1988). Several studies have also explained the importance of attitude as a determinant of future classroom use of emerging technology (Van Braak, 2001); (Akbaba & Kurubacak, 1999); (Clark, 2006); (Myers & Halpin, 2002); (Huang & Liaw, 2005); (Van Braak, Tondeur, & Valeke, 2004).

Over the years, National Open University of Nigeria (NOUN) has striven to improve the teaching and learning experience of staff and students. In order to support this process, NOUN's initial focus was on building an Information and Communication Technology (ICT) infrastructure. Focus has now shifted to using this infrastructure to support the teaching and learning process, underscoring the importance of interactions among staff and students to create an effective teaching and learning environment.

A number of Educational Technology (Ed Tech) initiatives are being pursued. Key goals for Ed Tech at NOUN include:

1. Implementing discipline - specific pedagogical strategies that require students' active engagement and develop their problem-solving and problem-posing skills;
2. Creating a learning environment that challenges students to become actively engaged, independent, lifelong learners in and out of formal learning spaces;
3. Enriching learning experiences through enhanced interactive learning;
4. Offering flexible and cost-effective quality learning to time- constrained and economically deprived students;
5. Alleviating staff and space capacity constraints within the institution;
6. Achieving learner-centred education, and enabling open and distance learning; and
7. Developing teachers who make learning relevant, exciting and effective, while achieving efficiencies that will help them meet their multi-faceted academic responsibilities.

The National Open University of Nigeria (NOUN) was established on 22 July 1983 to serve the needs of both young and adult distance learners, whether currently employed or seeking employment. Establishing the NOUN responded to one of the major objectives of the Nigerian National Policy on Education: providing equal educational opportunities to all citizens at all levels of education, thus widening participation in education.

The National Universities Commission (NUC) policy guidelines (NUC 2009) for open and distance learning in Nigerian universities encourage the use of technology in deploying distance education programs. According to these guidelines, content delivery should be based on resource-based pedagogies and the management of assessment processes should be automated. In line with the NUC policy guidelines, and funded by the Educational Technology Initiative of the Partnership for Higher Education in Africa (PHEA), the project described in this case study explored the use of mobile technology to support distance learning students. Effective decisions regarding the role and application of mobile technology in the educational system must incorporate stakeholders' perceptions and requirements.

### **Purpose of the Study**

The study will have focused on predictors of acceptance of mobile Technology in NOUN. Specifically, the study sort to achieve the following objectives:

- (a). To determine whether performance expectancy has positive influence on student's attitude towards the use of mobile technology for learning.
- (b). To find out positive effort expectancy on student's attitude towards the use of mobile technology for learning.
- (c). To determine whether social factors have positive influence on student's attitude towards mobile technology for learning.

### **Research Questions**

1. Does performance expectancy have influence on student attitude towards mobile technology for learning?

2. Will effort expectancy have influence on student attitude towards mobile technology for learning?
3. Do social factors have influence on student attitude towards mobile technology for learning?

### Research Hypotheses

Three null hypotheses were formulated and tested at 0.05 level of significance.

**HO<sub>1</sub>:** There is no significant relationship between performance expectancy and student attitude towards mobile technology for learning.

**HO<sub>2</sub>:** There is no significant relationship between effort expectancy and student attitude towards mobile technology for learning.

**HO<sub>3</sub>:** There is no significant relationship between social factors and attitude towards behaviour to use mobile technology for learning.

### Research Methodology

Descriptive survey method was used which for the study. However, Predictors of Acceptance of Mobile Technology for Learning (PAMTL) questionnaire were used as the instrument for data collection. In order to measure the students' acceptance of mobile technology for instruction, an adapted PAMTL questionnaire was used as research instrument from Technology Acceptance Model of Davis (1986). Likert-type scale with five degrees of Strongly Agree, Agree, Neither Agree, Disagree and Strongly Disagree (5, 4, 3, 2, 1) was adopted. The researcher visited the sampled National Open University of Nigeria (NOUN) with PAMTL questionnaire as an instrument for data collection which lasted for the periods of ten (10) weeks.

### Sample and Sampling Techniques

The sample was taken from the current academic year (2016/2017), all the National Open University students in five (5) north central Nigeria had registered 26,236 students. Instead of using the whole population which is large, the researcher used purposive sampling to select respondents. The sample used for this study was 353 respondents from all study centered.

### Reliability of the Instrument

To determine the reliability of the PAMTL questionnaire, the questionnaire was subjected to pilot test to ascertain its reliability. A sample of one hundred (100) students were randomly selected from the population of the study which were not used for the research. The questionnaires were distributed and retrieved by the researcher. The scores obtained were computed using Cronbach's Alpha Reliability coefficient formula and (0.7) was obtained.

### Results and Discussion

**Table 2: Summary of correlation coefficient, R-Square and Adjusted R-Square**

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
1	.549	.302	.296	5.49014

- a. Predictor (constant) Performance expectancy, Effort expectancy, Social factors.
- b. Dependent Variable: Attitude.

Table 2 presents the result of correlation coefficient (R) = .55 which is the combination of the predictors of the study and the adjusted R-Square = .30. This indicates that the three predictors (Performance expectancy, Effort expectancy and Social factors) explained 30% of the variance in student's attitude to use mobile technology for learning. This suggests that there are other factors that may impact on student's attitude to use mobile technology for teaching which are not accounted in this study.

**Table 3 showing Summary of Analysis of Performance expectancy, Effort expectancy, Social factors and Attitude**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4557.037	3	1519.012	50.396	.000
Residual	10549.574	350	30.142		
Total	15106.610	353			

- a. Predictor (constant) Performance expectancy, Effort expectancy, Social factors.  
 b. Dependent Variable: Attitude.

Table 3 revealed the analysis of variance which shows that  $F = 50.396$  was significant, this indicated that the combination of the predictors significantly combined together to predict acceptance to use mobile technology for learning.

**Table 4: Regression analysis for Performance expectancy, Effort expectancy, Social factors and Attitude to use mobile technology for learning.**

Model B	Unstandardized		Standardized		t	Sig.	Collinearity Statistics	
	Std. Error	Beta( $\beta$ )	Coefficients	Coefficients			Tolerance	VIF
(Constant)	11.085	4.109			2.698	.007		
Total								
PE	-.269	.093	-.131		-2.895	.004	.972	1.029
EE	.272	.085	.156		3.217	.001	.848	1.179
SF	.641	.068	.456		9.461	.000	.860	1.163

- a. Predictor (constant) Performance expectancy, Effort expectancy, Social factors.  
 b. Dependent Variable: Attitude.

Table 4 reveals technology acceptance of performance expectancy, effort expectancy, social factor and attitude towards the use of mobile technology for learning. The table showed technology acceptance of performance expectancy ( $\beta = -.131$ ,  $t = -2.895$ ,  $p < 0.05$ ); effort expectancy ( $\beta = .156$ ,  $t = 3.217$ ,  $p < 0.05$ ); and social factor ( $\beta = .456$ ,  $t = 9.461$ ,  $p < 0.05$ ). This results revealed that technology acceptance of performance expectancy significantly influences the use of mobile technology for learning with ( $\beta = -.13$ ), this effect size stands to be weakest among the variables of the study. Effort expectancy was also contributed significantly to attitude of participants, while social factors also have significant effect on their attitude. This implies that if students prepared and developed positive attitude towards the use of mobile technology for learning it will influence their acceptance of mobile technology for learning in their professional engagement.

**Discussion of finding**

This study examined the variables that influence the acceptance of mobile technology for learning in National Open University of Nigeria (NOUN) in North Central Nigeria. Based on this case study, the finding shows that performance expectancy, effort expectancy, social factor were significant predictors of students' attitude to adopt mobile technology. The was in agreement with finding of attitude on adoption

was consistent with the study of (Cui & Wang, 2008; Shittu et al. 2014). Another important finding of this study was that social factor positively influences students' attitude on acceptance of mobile technology for learning. In fact, the influence of social factor stands to be the strongest influence of the study.

On the research question that sought to know the influence of performance expectancy on attitude towards the use of mobile technology for learning, the study revealed that performance expectancy has significant influence on students' attitude to use mobile technology. The finding supported the finding of (Wong, 2015) that concluded that intention to use IT is influenced by perceived usefulness.

For the relative hypotheses, results showed that: a) perceived ease of use positively affected attitude, b) performance expectancy and attitude toward using positively affected mobile technology for learning; c) social factor positively influence attitude. These results were consistent with the findings on TAM proposed by Davis (1989). Even though a number of studies have shown that perceived ease of use positively affected intention to use (Ong & Lai, 2006; Wang et al., 2006; Yoon & Kim, 2007).

### Conclusions

The study has shown that the mobile technology was a major predictor of students' performance expectancy and attitudes, effort expectancy and attitudes, social factors and attitudes and attitudes, to use mobile technology for learning. The results of this study show that the students were fully aware of the inherent advantage of mobile technology for learning. Students' Attitude towards mobile technology learning. At present, there is growing concern among educators on how best to use emerging technologies to support learning vis-à-vis the general attitude of teachers to the integration of technology that is seen as a normal part of our everyday life which be attractive by the students to accept (Naismith et al. 2005).

### Recommendations

- I. Students should be encouraged to developed positive attitudes and behavioural intentions to accept mobile technology for learning, hence the use of mobile technology will equip the students with both skills and competency to face the challenges of modern life.
- II. Therefore, it is also recommended that the lecturers and trainers in the university be encouraged to use the mobile technology for educational purposes via training and retraining on how to effectively use the emerging resources for implementing the university's curriculum. This training will enable both students and faculty members to make use of the unlimited advantages that are inherent in the present information explosion of the mobile technology era.

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