

'Learning on the Move': The Behavioural Intentions of Nigerian Students With Disabilities

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ABSTRACT

There has been an increased global attention on the need to make education more flexible and accessible due to the advent of modern mobile technologies. These modern mobile technologies enable people including those with disabilities to receive education anywhere and anytime. This study therefore investigated the behavioural intentions of Nigerian Students With Disabilities (SWDs) to adopt Mobile Learning (ML). The descriptive survey design was used. Data were collected through a self-structured, validated and reliable ($r=.78$) questionnaire from a total of 104 purposively selected SWDs. Two research questions and one null hypothesis guided the study. Multiple Regression (MR) and Independent t-test were used for data analysis. Findings revealed that the selected five factors namely computer self-efficacy, perceived usefulness, computing skills, ease of use, and enabling environment jointly contributed 5.3% to the variance in behavioural intentions of SWDs to adopt mobile learning. Also, the relative contributions of each of the explanatory variables in order of importance were computer self-efficacy ($\beta=.331$), perceived usefulness ($\beta=.201$), computing skills ($\beta=.111$), perceived ease of use ($\beta=.086$), and enabling environment ($\beta=.012$). Significant difference in behavioural intentions to adopt mobile learning among SWDs was established based on gender ($t\text{-cal} = .303$; $df = 102$; $p < .05$). Although, mobile learning is still considered as a new technological innovation worldwide, its usage has grown tremendously. It is therefore recommended among others that ML providers should develop more friendly and easy to use ML systems and devices for the SWDs. The SWDs should develop positive computer self-efficacy beliefs and improve upon their computing skills.

Keywords: *M-learning, Students with disabilities, Computer self-efficacy, Computing skills, Perceived ease of use*

INTRODUCTION

In the recent times, one of the newly emerging academic fields seems to be Mobile learning (M-learning). In fact, m-learning is still in an evolving phase, thus, confirming its newness in education parlance (Peng, Su, Chou, & Tsai, 2009). Mobile technologies, which have advanced considerably over the last decade, have enabled learning to be more accessible. There has therefore been a growing awareness that these mobile technologies may benefit teaching and learning as they advance. Equally worthy of mentioning is the fact that there has been a tremendous increase in the numbers of mobile users globally (Lagoke, Oladejo &

Oladejo, 2011). This rapid growth of mobile users will push educational institutions to adopt mobile learning solutions.

Ayoade (2015) while lending credence to Lagoke et al.'s (2011) submission, remarked that the recent emergence of mobile learning can provide a new platform for institutions in Nigeria to enhance education as it provides a new way to deliver education without installing complex communication infrastructures. This is possible more so that m-learning has been found to be highly rewarding especially when the student is on the move or in a non-space, because it provides on-the-spot access to information. Another very important reason for increased attention being paid towards m-learning is the increase in the number of mobile devices such as mobile phones, personal digital appliances PDAs, laptops, and iPads, as well as enhancements in the technological capabilities of these devices.

The Federal Government of Nigeria, in the *National Policy on Education* (2013), recognizes the prominent role of ICTs in the modern world, and has integrated them into Nigeria's education system. The Nigerian Federal Government has also commissioned a Mobile Internet Unit (MIU) operated by the Nigerian National Information Technology Development Agency (NITDA). All these among others are efforts aim at developing mobile learning in Nigeria.

Mobile learning refers to "e-learning using mobile devices and wireless transmission" (Chang & Pang, 2011). According to Peng et al., (2009), there are two important aspects of m-learning namely its ubiquity and mobility. Ubiquitous computing is access to computing technologies whenever and wherever they are needed and mobility can be defined as learning on the go. El-Hussein and Cronje (2010) asserted that for mobile learning as an educational activity to make sense, the technology in use must be fully mobile and that the users of the technology are also mobile as they learn. The assertion of El-Hussein and Cronje basically underscored the *mobility* characteristics of learning as well as the significance of the term "mobile learning".

The adoption of mobile learning in education is however being confronted with myriads of challenges such as mobile devices having small screens, limited processing power, and small keyboards (Wang, Wu & Wang, 2009). Kukulka-Hulme (2007) also remarked that memory size of many mobile devices is said to be too small to hold the course resources such as PDF files and other multimedia enhanced resources, while Lagoke, et al. (2011) and Vosloo (2012) argued that these mobile devices also suffer from risk of loss due to their portability. As a result of these challenges, some users have negative perceptions towards using these devices for education purposes, and this makes adopting mobile learning difficult (Wang, Wu, & Wang; Vosloo).

Several factors have been reported as determining the behavioural intentions to adopt m-learning in previous research. As an instance, Phuangthong and Malisawan (2005) established that people's attitude towards, and adoption of m-learning was influenced by perceived enjoyment. Similarly, Ju, Sriprapaipong and Minh (2007) found out that perceived usefulness has a significant influence on users' attitudes, which further relates to the users' intention to adopt m-learning. In their study, Wang, Wu and Wang (2009)'s study confirmed learning at a self-managed pace, perceived usefulness, social influence, performance expectancy, and effort expectancy as important determinants of users' intentions to adopt m-learning.

Davis (1989) developed the Technology Acceptance Model (TAM) in his study on computer usage behaviour among 120 users at an IBM research facility. Findings from this study revealed perceived usefulness (PU) and perceived ease of use (PEOU) as the two powerful factors that influence the adoption of technology. Venkatesh, Morris, Davis and Davis (2003) later proposed the Unified Theory Of Acceptance And Use Of Technology (UTAUT) based on Davis's (1989) two TAM constructs. Since then, several other studies have used these two concepts to demonstrate their impact on intention; for example, studies conducted on Web 2.0 (Shin & Kim, 2008), broadband Internet (Oh, Ahn, & Kim, 2003), e-commerce (Gefen & Straub, 2000), digital libraries (Hong, 2002), and virtual communities (Lin, 2006).

Chang and Pan (2011)'s study on the adoption of Multi Media System (MMS) with the use of questionnaire to find out the factors that influence the users' intentions. Findings from this study showed that relative advantage and ease of use are important factors significantly influencing mobile users' adoption of MMS whereas, facilitating conditions and previous experience, do not have significant and direct impacts on mobile users' intention to use MMS.

It has also been reported that enabling environment is a good determinant of behavioural intentions to adopt new technology. For instance, Venkatesh, et al. (2003) while defining facilitating conditions as the

degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system, asserted that acceptance of any new technology largely depends upon the supporting conditions/environment. Equally demonstrated in previous studies is the fact that the level of Computing skills possessed by individuals has a significant impact on an behavioural intention to adopt a new technology, especially mobile devices for M-learning (Fadare, Babatunde, Akomolafe, & Lawal, 2011; Matthieson, 1991). Furthermore, Computer Self-Efficacy (CSE), which is the belief someone has about one's ability to perform a variety of computing tasks has been found out to have a strong influence on behavioural intention to adopt mobile learning among students (Hasan, 2003).

On the issue of gender differentials in adopting m-learning, some previous studies confirmed that gender affects the behavioural intention of using technology (Callum, 2010). Specifically, Cavus, Bicen and Akeil (2008) reported no statistical difference between gender, while Li and Kishore (2010) revealed that a significant variance is observed between gender groups on effort expectancy, gender groups performance expectancy, effort expectancy and social influences on the IT knowledge in Hong Kong. The observed contradicting findings served as the motivating and compelling factor to further investigate the behavioural intentions of Students With Disabilities (SWDs) to '*learn on the move*', that is, mobile learning. This is very important because of the peculiar nature in terms of disabilities of this category of learners in Nigeria, which perhaps, might place them in a disadvantaged position.

Statement of the Problem

The unprecedented manner by which mobile devices has penetrated Nigeria has resulted into many Nigerians now having better access to these mobile devices more than clean portable water, good health care facilities, and even electricity. It is becoming increasingly difficult to ignore the importance of mobile learning to enhance education in higher education in Nigeria. In spite of this penetration of mobile devices in higher education in Nigeria, it appears their application and utilisation to enhance learning on the move, especially among Students With Disabilities (SWDs) is not widespread. Therefore, there is a need to determine the factors that contribute towards the behavioural intentions of SWDs to adopt mobile learning in Nigeria which seems to have received little attention among researchers in order to facilitate adoption and usage of mobile learning.

Purpose of the Study

The broad aim of the study was to investigate the behavioural intentions of Nigerian Students With Disabilities to adopt mobile learning. Its specific objectives however, were:

- i. to determine the extent of joint contribution of the selected explanatory factors namely computer self-efficacy, perceived usefulness, computing skills, perceived ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs.
- ii. to find out the relative contributions of computer self-efficacy, perceived usefulness, computing skills, perceived ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs.
- iii. to examine the difference in behavioural intentions to adopt mobile learning between male and female Nigerian SWDs.

Research Questions

The following research questions were raised and answered with a view to achieving the first-two specific objectives:

- i. What is the joint contribution of the selected explanatory factors namely computer self-efficacy, perceived usefulness, computing skills, perceived ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs?

- ii. What are the relative contributions of computer self-efficacy, perceived usefulness, computing skills, perceived ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs?

Null Hypothesis

In order to achieve the last specific objective, the null hypothesis below was formulated and tested at .05 level of significance:

- i. There is no significant difference in behavioural intentions to adopt mobile learning between male and female Nigerian SWDs.

METHODS

The procedure used in carrying out this study is discussed in this sub-section. It examines research design, study population, sample and sampling techniques, instrumentation, validity and reliability of the instrument, and method of data analysis.

Research Design

This study used the descriptive survey research design. This design is appropriate for the study of this nature because the researchers used questionnaire to collect data from a large study population with a view to describing the existing situation concerning the behavioural intentions to adopt mobile learning among Nigerian SWDs.

Population of the Study

The target population for this study was made up of all 906 students with disabilities at Federal College of Education (Sp), Nigeria as at the time of conducting the study. This College is the first and only college of education in the entire Sub-Saharan Africa, dedicated to producing teachers that will teach students with one form of disability or the other. However, this population does not include part time/sandwich and preliminary students with disabilities in the College.

Sample and Sampling Techniques

The sample size for the study comprised of 104 students with disabilities who were selected through non-probability type of sampling technique, specifically, the purposive. The need to adopt this technique was not unconnected with the fact that only students with disabilities were qualified to participate in the study. Also, purposive sampling technique was used to select the college, being the only one that produces teachers for students with disabilities.

Research Instrument

The researchers used a self-designed, validated and reliable instrument entitled "Behavioural Intentions to Adopt Mobile Learning Questionnaire (BIAMLQ)". This instrument was divided into Sections A and B. Section A probed into the bio-data of the participants, while Section B sought information on each of explanatory factors namely computer self-efficacy, perceived usefulness, computing skills, ease of use, and enabling environment. Each of these factors has five items. The items of the questionnaire were scored on a 4-point modified Likert scale types of Strongly Agree (SA), Agree (A), Strongly Disagree (SD), and Disagree (D) with weights of 4, 3, 2 and 1 respectively. The scorings were reversed for negative items for the purpose of analysis.

Validity and Reliability of the Instrument

Copies of the draft instrument were given to some senior colleagues in Measurement and Evaluation for contents, constructs, and face validity. Each of the sub-independent variables initially had between 8-10 items. The final draft however consisted of five items each due to appropriate modifications and suggestions. A pilot study was carried out on 50 participants from one special secondary school in Ibadan who were not part of the study. Internal consistency method of estimating reliability value, particularly the Cronbach Alpha,

was used to determine the reliability co-efficient. The obtained grand alpha value was .78, which shows that the instrument is reliable.

Method of Data Analysis

Data obtained were analysed using inferential statistical tools. Specifically, Multiple Regression Analysis (MRA) was used to answer the two research questions, while Independent t-test was used to test the only formulated hypothesis at 0.05 level of significance.

FINDINGS

Analysis of the collected data and its findings are as discussed in this section.

Research Question 1: What is the joint contribution of the selected explanatory factors namely computer self-efficacy, perceived usefulness, computing skills, ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs?

Finding: This is as shown in Table 1.

Table 1: Regression Analysis of the Independent Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.333 ^a	.078	.044	2.56543	1.544

- a. Predictors: (Constant), Computer Self-Efficacy, Perceived Usefulness, Computing Skills, Perceived Ease of Use, Enabling Environment
- b. Dependent Variable: Behavioural Intention To Adopt Mobile Learning

Multiple regression was run to determine the joint contribution of the selected explanatory factors namely computer self-efficacy, perceived usefulness, computing skills, ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs. Table 1 showed that the five selected explanatory factors have positive multiple correlation with behavioural intentions to adopt mobile learning among students with disabilities (R =.333). Also, the adjusted R square value of .044 indicated that the five selected variables jointly contributed 4.4% to the variance in the dependent variable, which is, students with disabilities’ behavioural intentions to adopt mobile learning. This implies that the remaining 95.6% is due to residuals, that is, those variables not included in the study.

However, in order to determine whether or not the adjusted R square value obtained above is significant, the Analysis of Variance (ANOVA) was run as indicated on Table 2.

Table 2: Analysis of Variance of the Regression

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	28.344	4	7.372	6.443	.014 ^b
Residual	814.260	116	7.072		
Total	832.604	120			

- a. Dependent Variable: Behavioural Intentions To Adopt Mobile Learning
- b. Predictors: (Constant), Computer Self-Efficacy, Perceived Usefulness, Computing Skills, Perceived Ease of Use, Enabling Environment

From Table 2, the F-value of 6.443 at 4 degrees of freedom was significant at 0.014 (p<0.05). Based on this, there was significant joint contribution of the selected factors to the dependent variable. This significance was not due to chance, hence, all the selected five explanatory factors should always be considered important in the determination of the behavioural intentions to adopt mobile learning among Nigerian SWDs

Research Question 2: What are the relative contributions of computer self-efficacy, perceived usefulness, computing skills, perceived ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs?

Finding: This is as shown in Table 3.

Table 3: Relative Contribution of the Selected Factors to Adopt Mobile Learning

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta (β)		
(Constant)	20.671	2.234		9.252	.000
Computer Self-Efficacy	.085	.169	.115	.503	.004
Perceived Usefulness	-.165	.183	.304	-.904	.044
Computing Skills	.261	.140	.086	1.858	.033
Perceived Ease of Use	-.035	.162	.123	-.666	.003
Enabling Environment	-.076	.138	.103	-.554	.533

Dependent Variable: Behavioural Intentions to Adopt Mobile Learning

From Table 3, the multiple regression run to determine the relative contributions of the selected explanatory factors namely computer self-efficacy, perceived usefulness, computing skills, ease of use, and enabling environment to behavioural intentions to adopt mobile learning among Nigerian SWDs showed that each of the selected variables contributed differentially to the behavioural intentions to adopt mobile learning among Nigerian SWDs. The relative contributions of these explanatory variables in order of importance are perceived usefulness ($\beta=.304$), perceived ease of use ($\beta=.123$), computer self-efficacy ($\beta=.115$), enabling environment ($\beta=.086$), and computing skills ($\beta=.086$) respectively.

Testing of Hypothesis

The only one formulated hypothesis is tested here and its finding revealed accordingly.

Null Hypothesis 1: There is no significant difference in behavioural intentions to adopt mobile learning between male and female Nigerian SWDs.

Finding: This is as shown in Table 4.

Table 4: Difference in Behavioural Intentions to Adopt Mobile Learning Between Male and Female SWDs in Nigeria

Variable	Gender	N	\bar{X}	SD	df	t-Cal	P	Remark	Decision
Behavioural Intentions to Adopt ML	Male	58	35.43	2.53	102	.311	.621	Not Sig	Accept HO ₂
	Female	46	33.76	2.45					

An Independent t-test statistical tool was used to establish significant difference in behavioural intentions to adopt mobile learning between male and female SWDs in Nigeria as shown in Table 4. Finding revealed that there was no significant difference in behavioural intentions to adopt mobile learning between male and female SWDs in Nigeria ($t\text{-cal} = .311$; $df = 102$; $p > .05$). Thus, the researchers failed to reject the null hypothesis.

DISCUSSION OF FINDINGS

Finding from research question one which probed into the joint contribution of the selected explanatory variables namely computer self-efficacy, perceived usefulness, computing skills, ease of use, and enabling environment to behavioural intentions to adopt mobile learning among SWDs in Nigeria revealed that the adjusted R square value of .044 indicates that the five selected variables jointly contributed 4.4% to the variance, that is, behavioural intentions to adopt mobile learning. The F-value of 6.443 at 4 degrees of freedom was significant at 0.014 ($p < 0.05$) as revealed by the ANOVA. Hence, there was significant joint contribution of the selected factors to the dependent variable. This finding corroborates that of Hasan (2003) who had reported that jointly and severally, some of the included independent variables in this study, specifically perceived usefulness, computing skills, and ease of use are correlated to the behavioural intentions of postgraduate students to use mobile learning in their academic endeavours.

Also, finding from research question two which asked about the relative contributions of the selected explanatory variables to behavioural intentions to adopt mobile learning among SWDs in Nigeria revealed the relative contributions of the explanatory factors in order of importance as perceived usefulness ($\beta = .304$), ease of use ($\beta = .123$), computer self-efficacy ($\beta = .115$), enabling environment ($\beta = .086$), and computing skills ($\beta = .086$) respectively. It should however be noted that the contributions of all these factors, except that of enabling environment were significant ($p < .05$). This finding agreed to the findings of Lawrence et al., (2008) and Iqbal and Qureshi (2012) which showed that perceived usefulness (.004), ease of use (.000), and facilitating conditions (.000) significantly affect the adoption of m-learning. Lawrence et al., argued that students' perceptions about m-learning usefulness and ease of use as well as facilitating conditions to support m-learning are the main driving forces behind the behavioural intentions to adopt mobile learning among the students. Computer Self-Efficacy (CSE), also has a strong influence on behavioural intentions to adopt mobile learning among students (Hasan, 2003), which is in line with the result of this study.

Finally, the formulated hypothesis which states that there is no significant difference in behavioural intentions to adopt mobile learning between male and female SWDs in Nigeria was accepted because finding from this study established no significant difference in the behavioural intentions to adopt mobile learning between male and female SWDs in Nigeria ($t\text{-cal} = .311$; $df = 102$; $p > .05$). This finding supports Cavus, *et al.* (2008)'s study which reported no statistical gender difference in behavioural intentions to adopt mobile learning among secondary school teachers in Newark, while Li and Kishore (2010), revealed that a significant variance was observed between gender groups on effort expectancy, performance expectancy, and social influences on the IT knowledge and adoption. It is possible that participants in this study, regardless of their gender, expressed likeness to adopt m-learning. They probably possess individual enabling drivers for m-learning adoption.

CONCLUSION

Although, mobile learning is still considered as a new technological innovation worldwide, its usage has grown dramatically. Rapid explosion of mobile technologies and its services in Nigeria has provided a new platform for higher institutions to widen access to education through mobile learning. This study has underscored the relevance of mobile learning among Nigerian students with disabilities. It has specifically highlighted some variables namely perceived usefulness, ease of use, computer self-efficacy, and computing

skills as possible factors that determine the behavioural intentions of SWDs to use mobile learning in their educational endeavours. The contribution of enabling environment to the behavioural intentions of SWDs to use mobile learning in this study was insignificant. This is a pointer to the fact that institutional administrators still have lots to do with a view to further motivating the SWDs to adopt mobile learning.

Globally, this study has revealed that SWDs in developing countries still need to be encouraged in adopting mobile learning. By this, international organisations and donor agencies can now direct their attention on this category of people so that their educational experience can be better off.

Finally, the scope of this study suggests that there are still lots to be done in this area. For instance, participants in this study were SWDs in a College of Education that has mandate to train teachers who will be teaching SWDs, hence a similar study in other conventional Colleges and Universities should be carried out for comparative purpose.

RECOMMENDATIONS

Based on the results generated from this study, it is hereby recommended among others that:

- i. ML providers should develop more friendly and easy to use ML systems and devices for the SWDs. This will make the mobile learning experience of SWDs to be more stimulating.
- ii. The SWDs should develop positive computer self-efficacy beliefs and improve upon their computing skills. This will motivate them to adopt mobile learning in their studies, regardless of their handicapping conditions.
- iii. Institutions of higher learning should ensure provision of enabling environment that is conducive to mobile learning adoption. Regular seminar on the merits of mobile learning should also be organised for SWDs.

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