

# Assessment of Application of Mobile Learning Devices among Business Education Students in South East Universities, Nigeria

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**Abstract**— This study assessed the application of mobile learning devices among business education students in south east universities in Nigeria. The study population comprised 1,102 students of business education in south east universities in Nigeria. Stratified sampling technique was used to draw 293 students that represented the sample frame for the study. A 5-point scale validated questionnaire with reliability coefficient of 0.84 was used for data collection. Mean, standard deviation and ANOVA were used for data analysis. Results revealed that the respondents apply mobile learning devices for education to a low extent. The respondents differed significantly in their mean ratings based on institution type. Based on the findings, the authors concluded that students use mobile learning devices for leisure than study and recommended among others that educators should acquire relevant competences on mobile learning and apply them using mobile devices for instructions while the curriculum planners should integrate digital literacy as a course to include mobile learning..

**Index Terms** — Assessment, application, mobile-learning, mobile-devices, business education, students, universities.

## 1 INTRODUCTION

Mobile learning (m-learning) is the delivery of electronic learning (e-learning) materials on mobile device. M-Learning utilities handheld computer, smartphones and other technological gadgets as devices for learning. Trifonavo and Ronchetti (2006) define m-Learning as personal digital assistant (PDA), digital cell phone and general mobile devices which can be small, autonomous and unobtrusive enough to accompany in every movement of life and that can be used in learning. Crompton (2013) sees m-learning across multiple contexts through social and content interactions, using personal electronic device. M-learning has grown in popularity in recent years. The use of wireless mobile, portable and handheld devices are gradually increasing and diversifying across every sector of education. This was observed by Traxler (2007) from the frequency of dedicated conferences, seminars and workshops all over the world in series to include: M learn 2002 in Birmingham; M learn 2003 in London; M learn 2004 in Rome M learn 2005 in Cape Town; M learn 2006 in Bannff, Alberta among others. In the same vein, many countries have initiated to provide mobile learning technologies to their citizens. For instance, according to Wylie (2014), the National Council for Curriculum and Assessment (NCCA) in Ireland is currently in phase 3 of experimenting with the use of cell phones at a number of Irish schools. The NCCA program aimed at increasing the level of oral fluency in Irish language by providing students with cell phones to support them in language classes. Students are sent text messages with Irish vocabulary words to use during classes, and call a number with voice-response system to leave answer to the teacher questions. Also, estimates put mobile subscription at more than 6 billion globally with at least 75% of these being in developing countries (Nigeria inclusive) and nearly 2.5 billion of the world population can now access the internet through mobile device alone (Ally and Tsinakos 2014). These are significant efforts in line with the UNESCOS goal of education for all in 21<sup>st</sup> century.

In the same direction, Umoru and Okeke (2012) listed M-learning devices among others to include mobile phones, iPods, mp3, personal digital assistants (PDA), USB drive, e-book reader, ultra-mobile pc (UMPC), smart phones, and tablets. These technologies seem to be playing important roles in university student's academic lives. Devices such as smartphones, tablets and e-book reader connect users to the world instantly, thereby heightening access to information and enabling interactivity with others. Applications that run on these devices let users not only consume but also discover and produce content (Dehlstrom 2012). Thus redefining the primary purpose of the mobile devices from making and receiving to retrieving the latest information on any subject. Shawe (2013) identified 12 benefits of M-learning devices as follows:

1. Access to content, peers, experts and previous thinking on relevant topics.
2. Performance of knowledge.
3. Increased collaboration with access to the cloud, all data sources and project materials are constantly available.
4. Transparency through natural products of connectivity, mobility and collaboration.
5. Learning by doing
6. Asynchronous learning which allows educational environment to move anywhere, anytime.
7. Self-actuated where learners plan topic, sequence, audience and application.
8. Divergent thinking where audiences are diverse, thinking is diverse as are the environment.
9. Evidence storage and management where learners adopt these technologies, store files, compare and evaluate publish thinking and connect learners.
10. Blending the learning style through physical movement, personal communication, learning styles and digital interaction.

11. Always-on-classroom never full where 24hr learning is self-activated, spontaneous and interactive.
12. Authentic learning which enable experiences that are truly personalized.

These technology rich activities can sustain high level of student engagement and peer collaboration compared to less technology focused activities (West, 2013). Mobile learning makes it possible to extend education beyond the fixed time period of school day, allow students to access content from home, communicate with teachers; and work with other people online.

Research according to Wylie (2014) has shown that academic performance of students can be improved with mobile learning devices. Unfortunately, most institutions in Nigeria restrict the use of mobile devices in classes. The issue of restricting mobile learning devices in classes does not allow students to harness the potentials of these devices in learning. Regrettably, Wylies stated that when the world inside schools looks so different from the world outside schools, when students are restricted, rather than embrace real technologies, students are left: (1) ill-equipped to know how to harness the power of technology for learning;(2) unprepared to develop a respectable digital footprint; and (3) without adequate knowledge to safely navigate the social web.

Consequently, Innovative educators should know that teaching and learning is shifting. Educators more especially business educators in Nigeria need to figure out how to harness mobile platforms for instructional purpose and employ them to boost educational learning. This is because almost all students in the universities (Federal, State and Private) in Nigeria own mobile device and the extent to which they apply these technology rich devices for education may differ according to the institution type. Sovlberg and Rismark (2012) explained that students in M-learning environments make choices to when they want to access the resources for learning purpose, where they learn and how they use the learning materials. However, to improve the teaching and learning quality, there is need to identify and analyze students' application of mobile learning devices for education with the view of designing learning material in line with mobile devices.

## 1.2 STATEMENT OF PROBLEM

The growing use of wireless technology and mobile devices suggest that training and education cannot ignore the use of these devices in learning and training process. Educators need to design learning materials for the mobile devices and look for safe and productive ways to integrate mobile devices into curriculum. Although many students in tertiary institutions in Nigeria own mobile devices, the purpose for which these devices are used is not guaranteed. Hence mobile devices such as smart phones, iPod, and mp3 among others seem to be used by students for mere leisure than study. Chen and Denoyelles (2013) found that there is a gap between students owing mobile devices and actually using them for academic purposes. This study, therefore, aimed at determining from business education students' point of view the extent they apply mobile-learning devices for education in universities in Nigeria as well as whether significant difference exists in their mean ratings based on the type of institution.

## 1.3 Research Question

A research question was developed and answered by this study:

What is the extent of application of mobile learning devices among business education students in south east universities in Nigeria?

## 1.4 Hypothesis

A null hypothesis was formulated for the study and tested at 0.05 level of significance:

There is no significant difference in the mean ratings of business education students from Federal, State and Private Universities in south east Nigeria on the extent of application of mobile learning devices for education.

## 1.5 Method

Descriptive survey research design was adopted for this study. According to Maduekwe (2011) descriptive survey research is for the study that use questionnaire to explore opinions of a given population or its representative sample on existing phenomena. The area of study was the south east zone of Nigeria comprising of five states namely Abia, Anambra, Ebonyi, Enugu and Imo. These states are regarded as education advantaged states in Nigeria. The people of these states are predominantly Igbos. The Igbos are known for hard work and academically inclined. The study population consisted of 1,102 students in south east universities in Nigeria that offer business education programme. The sample size was determined using Yaro Yamane formula for a finite population. Stratified sampling technique was used to draw 293 respondents that represented the sample frame for the study. The instrument used for data collection was a self-structured questionnaire validated by three experts in faculty of Education, Nnamdi Azikiwe University, Awka, Anambra State. The questionnaire was structured on a 5-point rating scale of: Very High Extent (VHE), High Extent (HE), Low Extent (LE), Very Low Extent (VLE) and Not Applied (NA) with corresponding values of 5, 4, 3, 2 and 1 respectively. The instrument has reliability coefficient of 0.84 obtained using Cronbach Alpha reliability test. Data collected were analysed using arithmetic mean and standard deviation for answering the research question as well as determining how close the responses were to the mean. Analysis of Variance (ANOVA) was used for testing the null hypothesis at 0.05 level of significance.

In taking decision on the research question, boundary limit was used. The null hypothesis of no significant difference was accepted for items whose F-calculated (F-cal) values are less than the F-table (F-tab) value of 3.00 at 0.05 level of significance. On the other hand, the null hypothesis of no significant difference was rejected for items whose F-calculated (F-cal) values are greater than the F-table (F-tab) value of 3.00 at 0.05 level of significance.

## 1.6 RESULTS

The results for this study were obtained based on the research question answered in Table 1 and hypothesis tested in Table 2.

### Research Question

What is the extent of application of m-learning devices among

business education students in south-east universities in Nigeria? Table 1.

The data for answering the research question are presented in

**Table 1: Mean Ratings of the Responses of Business Education Students in Federal, States and Privates Universities on the Extent of the Application of M-Learning devices in South-East Nigeria**

SN	M-learning resources:	Fed. Uni. (N= 93)		State Uni. (N= 102)		Private Uni (N= 98)		OVERALL (N= 293)		Rmk
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
1	Smart phones for processing information at a fast rate.	4.76	0.42	4.48	0.87	4.56	0.85	<b>4.60</b>	0.78	<b>VHE</b>
2	Flash drive for storing information	4.53	0.68	4.44	0.89	4.51	0.93	<b>4.48</b>	0.80	<b>HE</b>
3	MPs player to download podcasts and listen to lectures.	3.24	0.94	3.21	0.93	3.29	0.95	<b>3.24</b>	0.84	<b>LE</b>
4	E-book readers to download and store text-based instructional materials.	4.04	0.86	3.05	0.98	3.02	0.91	<b>3.37</b>	0.97	<b>LE</b>
5	Message box (MSB) drive for mass storage	3.83	0.97	3.06	0.97	3.00	0.87	<b>3.30</b>	0.95	<b>LE</b>
6	Personal Digital Assistants (PDAs) to edit text documents.	3.26	0.99	2.60	1.04	2.92	0.99	<b>2.93</b>	1.13	<b>LE</b>
7	Ultra-mobile PC to create and edit assignment.	3.44	0.87	2.65	1.19	2.90	0.95	<b>2.99</b>	1.06	<b>LE</b>
8	CD-Rom containing prepared lesson materials.	3.32	0.98	2.53	1.01	3.02	0.89	<b>2.96</b>	1.05	<b>LE</b>
9	Modems to access the internet.	4.22	0.76	4.20	0.91	4.32	0.94	<b>4.25</b>	0.93	<b>HE</b>
10	E-books software to conduct research.	3.34	0.83	2.42	1.07	2.69	1.01	<b>2.82</b>	1.19	<b>LE</b>
11	Tablet PC (ipad, surface RT for storage and research)	3.46	0.96	1.31	1.17	1.59	1.14	<b>2.12</b>	1.48	<b>VLE</b>

**Key:**  $\bar{X}$  = Mean; SD= Standard Deviation; N = Number of Respondents; VHE = Very High Extent; HE = High Extent; LE = Low Extent; VLE = Very Low Extent; Rmk = Remark.

The data presented in Table 1 shows that the overall mean ratings of the responses of the respondents on item 1 was 4.60 which fell within the boundary limit of 4.50 - 5.00 on 5-point rating scale. This indicated that item 1 that is; smart phones for processing information at a faster rate are to a very high extent applied as learning device for education by business education students in south-east universities. The mean values on items 2 and 9 were 4.48 and 4.25 respectively fell within the boundary limit of 3.50 – 4.49 on 5-point rating scale. This implied that the two items, that is flash drive and modems are to a high extent applied as learning resources for education by business education students in south-east universities. On item 11, the mean value was 2.12 which fell within the boundary limit of 1.50 – 2.49 indicating that tablet PC (ipad and surface RT) are to a very low extent applied as learning devices for education by business education students in south-east universities.

The mean values of the remaining seven items in the table ranged from 2.82 to 3.37 which fell within boundary limit of 2.50 – 3.49. This indicated that those identified seven mobile learning devices in the table are to a low extent applied as

learning devices for education by business education students in south-east universities. The standard deviation values of the 11 items in the table ranged from 0.78 to 1.48 which indicated that the responses of the respondents are close to one another and to the mean.

### 1.7 Hypothesis

There is no significant difference in the mean ratings of business education students from federal, state and private universities on the extent of application of mobile learning (m-learning) devices for education in southeast Nigeria.

The data for testing the hypothesis are presented in Table 2.

**Table 2: Analysis of Variance (ANOVA) of the Responses of Business Education Students from Federal, State and Private Universities on the Extent of Application of Mobile Learning (m-learning) devices for Education in Southeast Nigeria (N = 293)**

SN	M-learning devices	Total Sum of Square	Total DF	Mean Square	F-Cal	F-Tab	Rmks
1	Smart phones for processing information at a fast rate.	129.867	292	0.401	5.25	3.00	S*
2	Flash drive for storing information	130.328	292	0.452	0.72	3.00	NS
3	MPs player to download podcasts and listen to lectures.	207.201	292	0.699	4.16	3.00	S*
4	E-book readers to download and store text-based instructional materials.	277.242	292	0.815	10.15	3.00	S*
5	Message box (MSB) drive for mass storage	267.843	292	0.797	12.97	3.00	S*
6	Personal Digital Assistants (PDAs) to edit text documents.	310.055	292	0.969	9.01	3.00	S*
7	Ultra-mobile PC to create and edit assignment.	325.283	292	0.914	12.92	3.00	S*
8	CD-ROMs containing prepared lesson materials.	324.689	292	0.948	11.27	3.00	S*
9	Modems to access the internet.	258.758	292	0.887	2.58	3.00	NS
10	E-books software to conduct research.	290.587	292	0.764	8.17	3.00	S*
11	Tablet PC (ipad, surface RT for storage and research)	342.048	292	1.029	7.95	3.00	S*

**key:** N= Total Number of Respondents; Level of Sig. 0.05; S\* = Significant; NS = Not Significant.

The data presented in table 2 on hypothesis testing showed that the F-calculated (F-cal) values on items 2 and 9 were 0.72 and 2.58 respectively which were in each case less than the F-table (F-tab) value of 3.00 at 0.05 level of significance. This indicated that there were no significant differences in the mean ratings of the responses of business education students from federal, state and private universities on the extent of application of the two mobile learning (m-learning) devices for education in southeast Nigeria. Therefore, the hypothesis of no significant difference in the mean ratings of the responses of the three groups of students was accepted on the two items. On the other hand, the F-calculated (F-cal) values on the remaining nine mobile devices in the table ranged from 5.25 to 12.97 which are in each case greater than the F-table (F-tab) value of 3.00 at 0.05 level of significance. This implied that there were significant differences in the mean ratings of the students from federal, state and private universities on the extent of application of the nine mobile learning (m-learning) resources for education in southeast Nigeria. Therefore, the hypothesis of no significant difference in the mean ratings of the responses of the three groups of students was rejected on the nine items of mobile resources.

### 1.8 Discussion of Results

The finding of this study generally revealed that mobile learning devices such as smart phones, mp player, e-book readers, message box (MSB) drive for mass storage, personal digital assistants (PDAS), ultra mobile PC to create and edit assignments, CD-ROM containing prepared lesson materials, e-book software to conduct research and tablet Pc (Ipad, sur-

face RT for storage and research) were to a low extent applied as learning devices for education by business education students in south east universities in Nigeria. This is because as reported by Wylie (2014), that educators do not really prepare students to know how to harness the power of technological devices for learning. When the world inside school looks so different from the world outside schools, students are left ill-equipped. The findings agreed with the submission of Manir (2009) who reported that classrooms in higher institutions are not adequately equipped for effective ICT usage, thus undermining teachers and students efficient access to mobile learning (m-learning) resources within Nigerian institutions of higher learning. Additionally, the findings corroborated the findings of Onah (2013) who found that computer students in southeast universities were deficient in digital e-learning activities

Although, the study found that smart phones for processing information at a fast rate, flash drive for storing information and modems to access the internet were to a "high extent" applied as learning devices for education by business education students in south-east universities in Nigeria, the findings agree with the findings of Mandala (2013) who found high rate of use of smart phones, flash drive, modern and PCs as ICTs resources for social and learning purposes among Nigerian students in higher learning. This findings also are in line with the findings of Traxler (2007), Ally and Tsinekos (2014), Dehlstron (2012) and Shawe (2013) on the benefits of mobile learning devices.

The result of the null hypothesis tested showed a significant difference in the mean ratings of business education students in federal, state and private universities on the extent of appli-

cation of mobile learning (m-learning) devices among students. This implies that the type of institution is a factor. Hence the finding substantiated the hypothesized report of Leem and Lim (2007) that federal, state and privately owned institutions may differ in their application of mobile learning resources for instructional delivery because, universities are seriously lacking in preparations for mobile learning.

### 1.9 Conclusion

Based on the findings of the study, it is concluded as follows:

1. The application of mobile learning devices among undergraduate in the area of study is low.
2. Students use mobile devices for leisure than study.
3. Students are not trained on how to explore the potentials of mobile learning devices for education.

### 1.10 Recommendations

Based on the findings of the study, the following recommendations are made:

1. Educators, especially business educators should acquire relevant competences on how to explore high technology devices and apply them for instructions in line with mobile learning.
2. Curriculum planners should integrate digital literacy in the curriculum as a course to include mobile learning to help students adopt knowledge and learning practices associated with digital media and technological devices.
3. Educators should embark on further research on strategies for integrating m-learning in the curriculum.
4. Government should provide fund for professional development and training for educators to update their knowledge on mobile learning and technology devices.

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