

IMPLEMENTING MOBILE-LEARNING IN NIGERIA TERTIARY EDUCATIONAL SYSTEM – A Feasibility Study

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Abstract - This paper reports the pilot study on the feasibility of mobile-learning (m-learning) in Nigeria Tertiary Educational system. It investigates the level of availability and usage of mobile devices among students in Nigerian Tertiary Institutions. University of Ilorin- a Federal University and Kwara State University were the case study. One hundred students (100); fifty (50) from each of the universities were randomly sampled for the study. Structured questionnaire was used to elicit the kind of mobile devices being use by the students and the use to which they are currently putting them. T-test statistical inference was used to analyze the mobile and computer usage patterns among the students, the calculated mean for the mobile devices usage pattern (9.43) is greater than that of computer usage pattern (5.30). This shows that students use mobile devices to perform more functions than computer systems. This result was further analyzed using paired samples correlations which show that there is a very weak correlation (0.241) between mobile devices and computer usage patterns. Also, the t-calculated is 18.888 and using degree of freedom of 99 and confidence interval of 0.050 in t-distribution table, the table value is 1.980. It was therefore inferred that since the table value is less than the t-calculated value, there is a

significant difference between the mobile devices and computer usage patterns. The various types of mobile devices, and operations or usage to which they are being put to by students were summarized.

Furthermore, the academic relevance of these devices was discussed in relation to relevant theories of learning such as; behaviourism, constructivism, and socialism [11] that is enhanced by the usage pattern of mobile devices. It was concluded that the overall intention of blended learning, distance learning or e-learning is becoming more feasible in Africa especially in Nigeria via an emerging concept of m-learning. The green signal is the product of the general advancements in mobile communication technology, the availability, affordability and popularity of mobile devices among the digital native and digital immigrants [9] in Nigerian higher institutions of learning.

Keywords: Mobile Learning, mobile devices, digital natives, digital immigrants, learning theories.

I. INTRODUCTION

The delivery of a learning, training or education program by electronic means is known as Electronic Learning (e-learning) [10]. It is the application of network technologies to create, foster, deliver and facilitate learning anytime and anywhere. It could be a platform for Distance Learning when it is used solely for educational delivery. Furthermore, it could be a tool for enhancing the quality of education and complementing the traditional methods of education in what is known as Blended Learning. However, because of the complexity of e-learning paradigm, its implementation in the developing world encounters a lot of hitches. These challenges range from technological, attitudinal, curriculum and pedagogy, institutional readiness, teachers / learners competence, maintenance to sustainability.

Though, the attitudinal reasons were consequential in the sense that some of the current operators of the education sector are “Digital immigrants” [9] and 21st century illiterates, which according to Alvin Toffler as cited in [13] “will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn”. A good number of current operators in the education sectors are not comfortable with new technologies. According to [6], “the older people feel more threatened by new technologies”. Some have computer phobia while others might be looking at the retirement age being closer hence learning new skill is not worthwhile. So in order to be relevant while still in service, such group would try all they could to maintain the status quo.

Other challenges to the implementation of e-learning are the technological, technical and the

infrastructural problem. This is because, as the management struggles to get the unwilling pal to embrace the technology, soon they realized that the platform itself is having technical hitches. Or that it is becoming too expensive to manage the infrastructure. Since the initial capital for Information Technology projects in this part of the world are usually via statutory budget of government, donation or foreign intervention by the World Bank, UN, USAID and so on [8].

However, the advent of Mobile technologies - the 2nd and 3rd generation Global System for Mobile communication (2G/3G GSM), General Packet Radio Service (GPRS), Wireless Application Protocol (WAP), Infrared Data Association (IrDA), Bluetooth, IEEE 802.11, Wi-Fi, WiMAX and so on, which together with its corresponding mobile devices, are being adopted in Africa at a rate that is among the highest globally [2]. Mobile technology have the power to make learning even more widely available and accessible to learners across Africa, especially the vulnerable populations that could not benefit from e-learning projects due to lack of infrastructure and other factors. The depth of penetration of Mobile technologies globally is well captured in the following words of Ellen Wagner, in May 2005, as quoted in [4]:

“Wherever one looks, evidence of mobile penetration is irrefutable: cell phones, PDAs, MP3 players, portable game devices, handhelds, tablets, and laptops abound. No demographic is immune from this phenomenon. From toddlers to seniors, people are increasingly connected and are digitally communicating with each other in ways that would have been impossible only a few years ago”

These assertion depicts what is obtainable in Nigeria higher institutions and it is corroborated in the words of [5] that “half of Africa’s one billion population has a mobile phone and not just for talking...” furthermore, “...mobile technology has had a positive effect increasing

the digital inclusion statistics and provides a medium for those with low self efficacy in ICT to access the Internet”, [7]. With this development, a new learning technique that rely on mobile technology is emerging, it is known as m-learning or mobile learning, it is an extension of e-learning. In his words, m-learning is e-learning through mobile computational devices. [2]

When Distance Learning method is combined with the Traditional method of schooling, the resultant method is known as Blended Learning. The relationship is as depicted below:

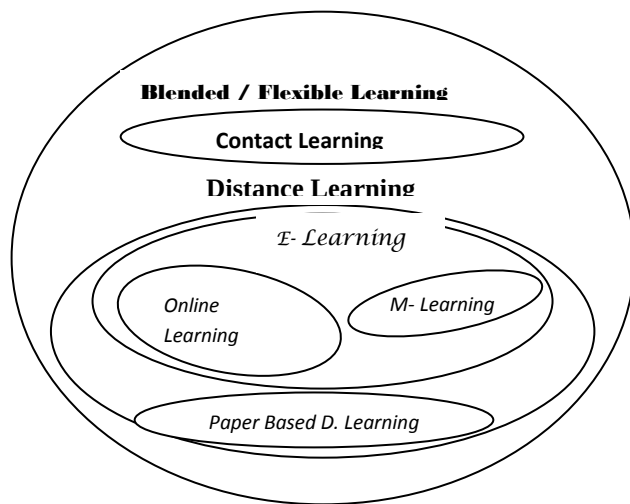


Diagram 1: Relationship between M-learning, E-learning, Distance learning and Blended learning. Adopted from [2].

The motivation for this study is therefore, the quest to establish the level of availability of mobile devices to Nigerian students, the need to identify the various type of mobile devices being used by them, and the need to ascertain how and what they are using their mobile devices for. The result of the findings would provide the clue to whether or not the mobile technology and its corresponding mobile devices could be a panacea for the actualization of the goals of blended learning, distance learning and e-learning in Nigeria. Particularly as it alleviate the problems associated with infrastructure,

technical knowledge for maintenance and operational literacy. Furthermore, the study aimed at establishing the educational or instructional relevance of the current usage pattern and ownership of mobile devices on the students. Finally, it is meant to infer whether or not our students at tertiary level of education in the country have imbibed the required digital attitudes and skills necessary to use the m-learning platform efficiently.

II. METHOD USED

The populations for this study are students of Nigerian tertiary level of education. One hundred (100) students were randomly sampled in all, Fifty (50) students each from University of Ilorin- a Federal University and Kwara State University. Structured questionnaires were used to elicit the kind of mobile devices being use by the students and the use to which they are currently putting the mobile devices. Some usage indices adopted from [3] and [12] include; Voice call, Send or receive SMS, Send or receive MMS, Google Internet / website access, Internet/instant messaging, Internet/download Applications, Play audio, Record audio, Watch video, Record video, Snap pictures, Play games, and Wireless data transfer

III. RESULTS AND DISCUSSION

What is the distribution of mobile devices and computer usage pattern among Nigerian Students? Table 1 below summarizes our findings

Table 1: Summary of mobile device and computer usage pattern among students

Usage in the current semester	n	Mobile	Computer
Voice call	100	100	9
Send or receive sms	100	100	13
Send or receive mms	100	44	10

Google Internet / website access	100	96	80
Internet/instant messaging - IM	100	56	47
Internet/download Applications	100	52	81
Play audio	100	98	78
Record audio	100	53	13
Watch video	100	67	61
Record video	100	39	8
Snap pictures	100	72	29
Play games	100	82	79
Wireless data transfer	100	84	22

Is there a significant difference between mobile devices and computer usage patterns among Nigerian Students? The responses of all 100 respondents were analyzed using T-test and the result of the analysis is shown in Table 2, 3 and 4 below:

T-test of mobile devices and computer usage patterns among students

Table 2: Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 MOBILE	9.43	100	1.458	0.146
COMPUTER	5.30	100	2.018	0.202

Table 3: Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 MOBILE & COMPUTER	100	0.241	0.016

Table 4: Paired Samples Test

	$\bar{X}$	Std. Dev.	Std. Err.	95% Confd. Interval of the Diff.		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 MOBILE – COMPUTER	4.13	2.187	0.219	3.70	4.56	18.888	99	0.000

From table 2 above, the calculated mean for the mobile devices usage pattern (9.43) is greater than that of computer usage pattern (5.30). This shows that students use mobile devices to perform more functions than computer system. This result was further analyzed using paired samples correlations in table 3 which shows that

there is a very weak correlation (0.241) between mobile devices and computer usage patterns. Also, in table 4, the t-calculated is 18.888 and using degree of freedom of 99 and confidence interval of 0.050 in t-distribution table, the table value is 1.980. Since, the table value is less than the t-calculated value this means that there is a significant difference between the mobile devices and computer usage patterns.

What are the available mobile devices among Nigerian Students? Table 5 below summarizes our findings:

Table 5: Summary on the kind of mobile devices use by Students

Voice call enabled mobile devices	n	yes	%
Mobile phone (ordinary)	100	20	20
Internet enable phones and smart phones	100	69	69
Black berry	100	13	13
Others in addition to the above	n	yes	%
IPOD	100	16	16
PDA	100	20	20
MP3 player	100	33	33

Table 5 above shows that every respondent has at least one mobile device which implies that 100% of the sample has at least one mobile device. It further shows that 82% of the students have Internet enabled mobile devices, and the remaining 20% have non-WAP enabled mobile phones. The results also indicate that the students also have some mobile devices in addition to their voice call enable devices, it shows that 16% of the populations have IPOD, 20% have PDA and 33% have mp3 player.

What are the educational implications of the available mobile devices and usage pattern among Students?

The instructional relevance of some of these devices which corroborates the work of [4] includes:

iPod – a media player with facilities for downloading music, audio books, podcasts, photos and video, it can therefore be used by the students to download podcast of lectures, listening to audio books and lectures and read e-books.

Personal Digital Assistant (PDA) – is a programmable system that has computing capability, Internet access, Wi-Fi and pen/stylus interface. It can be used by students for all that were mentioned for iPod plus going online for Internet browsing

MP3 player – is a digital audio player that can be used by students to listen to recorded lectures and audio books. Some of its versions have integrated voice recorder which can be used to record lectures for future use.

Smart phone – is a mobile device that combined telephone capability with all the features of a PDA, camera, mass storage, MP3 player all in one compact system.

Furthermore, the relevance of the mobile device usage pattern to learning can be discussed in terms of the three main philosophical theories of learning; Behaviourism, Cognitivism and Constructivism [11].

The Behaviourism theory of learning

The behaviourism focuses on the objectively observable aspect of learning; it has to do with skill development [1]. Critical analysis of the mobile device usage pattern among Nigerian students, revealed their new ways of life. It reveals their new behaviors and new culture of downloading, uploading, sending and receiving text messages, digital photographing, video and audio recording, Internet browsing and so on. All these are pointers to the various methods that could be employed to observe and ascertain the

extent of knowledge they have acquired in any subject.

The Cognitivism theory of learning

The Cognitivism approach to learning is based on the fact that learning is purely a mental/neurological process and that it involves Perception, Decision making, Attention, Memory, & Problem Solving steps [11]. But, “Different kinds of experiences lead to different brain structures“, says Dr. Bruce D. Perry of Baylor College of Medicine as quoted in [9]. Browsing the Internet via the mobile devices seamlessly expose the students to ocean of contents, games, activities and videos, far beyond what is possible in the classroom. This consequently improves the students’ intellectual capability.

The Constructivism theory of learning

Constructivism views learning as a process in which the learner actively constructs or build new ideas or concepts. It is also known as Social constructivism which indicate that knowledge is constructed when individual engage socially in talk and activity about shared problem or task [11]. Versions of Constructivism include Active learning and Discovery learning. In all, the learner is expected to be actively involved. Hence, it is learner-centred. The usage pattern of mobile devices among the students enhances constructivism theory. They join different Forums and Networks to share ideas and other resources. They could post issues, gather information and methods from which they could build up their own knowledge.

IV. CONCLUSIONS, SUGGESTIONS AND RECOMMENDATIONS

The result of this research clearly shows that the students in Nigerian universities are well prepared for m-learning. They have imbibed the

required interest and attitude in terms of acquisition of various types of mobile devices. They have also demonstrated high level of operational skills for successful implementation. It is also deducible from the study that mobile technology could save the management from the trouble associated with Computer and Internet Infrastructure which is the channel for instruction delivery and tracking. Hence, Government and Management in the education sector could concentrate on building m-learning platform for other components such as authoring, publishing and content development which are the backend components to be handled by the teachers.

If well implemented, m-learning-enhanced blended learning will improve the quality of education in the developing world, as it provides the required supplement to what is obtainable with the traditional system of learning. It will as well leverage on the students' non-academic usage pattern, teach and actualize the goal of the curriculum.

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