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Problems and prospects of mobile learning devices among undergraduate students

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Abstract
This study is an exploration of the problems and prospects of mobile learning devices in the Department of Curriculum Studies and Educational Technology, Faculty of Education, University of Port Harcourt. The analytic descriptive survey design was adopted. A sample of 100 undergraduate students took part in the study. A questionnaire was used for data collection. The Cronbach alpha reliability test model was used to establish the reliability of a questionnaire to obtain an index of 0.72. The study was guided by two research questions. Mean and Standard Deviation (SD) were used for data analysis. The mean rating of the students showed that they encountered some possible challenges while using their mobile learning devices for academic purposes, 2.53, SD=0.76. The key challenges of using mobile learning devices for academic purposes was that it has short battery lifespan (M=3.42, SD=0.73). This was followed by the fact that mobile learning devices are very expensive (M=3.33, SD=0.83), while the least was that it is time-consuming (M=2.81, SD=1.07). The students rated the possible ways to improve on the challenges of using mobile devices for learning purposes, 2.89, SD=1.13 above the criterion mean of 2.5 The key possible solution for the challenges was the constant power supply (M=3.87, SD=0.34). This was closely followed by low subscription rates for online courses (M=3.63, SD=0.52) while the least was the provision of learning materials (M=3.40, SD=0.65). It was recommended among others that government through the various school authorities should ensure that there is constant power supply at all times as these devices cannot operate without electrical power.

Keywords: problems, prospects, mobile, learning, devices

Introduction

The changes brought about by the development in Information and Communication Technology (ICT) and evolving learners' behaviour which requires learning institutions to continuously re-evaluate their approaches to pedagogy, both in the physical and the virtual classroom spaces do not go without some form of challenges. In the recent past, there has been an increasing interest in Mobile Learning using varying devices in sizes from the large, such as notebooks, laptops, to small like mobile phones and PDAs (Personal Digital Assistant). Although there are negative perceptions towards the use of mobile phones in education, the potential of mobile phones to support teaching and learning has been discussed frequently in academic literatures.

Basically, Mobile Learning is the use of any mobile or wireless device for learning on the move that can aid the acquisition of knowledge, regardless of location and time" Aderinoye, Ojokheta, and Olojede (2007) [1]. By implication, Mobile Learning systems should be capable of delivering instructional content to learners anywhere and anytime it is required. It also implies that students do not need to be of a specific group or at the specific geographical area to participate in learning opportunities.

As Kennedy, Krause, Judd, Churchward & Gray (2006) [2] posited, ''Mobile devices, without doubt, are almost ubiquitous with a greater percentage of the university students born since 1980- the digital native (people born during or after the introduction of digital technologies) generation-having some sort of access to a mobile device.'' Indeed, many scholars/studies have tried to define the learning patterns of this generation. In that bid, Prensky (2005) [19] coined the term ''digital native,'' describing their learning as ''short burst, casual, multitasking.'' Moreover, as Kennedy *et al*., (2006) [5] inferred, that digital natives learning can be characterized by a preference for receiving information quickly, coupled with the ability to process it rapidly which is a bias towards multi-tasking and non-linear access to information thereby relying so much on ICT for information and communication which obviously a preference for active involvement in learning over passive learning in lectures.

Fundamentally, the concept of Mobile Learning is still emerging and still not very clear. How it will eventually be conceptualized will be determined by the perceptions and the expectations of the users. The users in this context are the community of educators and learners. Learning is determined by the various technologies that have been utilized in the past and in the present. In the immediate past, the basic traditional method for instructions were textbooks but recently and in this modern technological era the acquisition of knowledge is dependent on the ability to utilize the emerging technological devices for educational purposes. These emerging technologies have paved way to the paradigm shift in the way educational practices are attained with the resultant of enhancing the learning process in such a manner that was not possible before now with its own challenges. Suffix it to state that the internet has provided the opportunities for communication and by extension made learning experiences better. Thus, this development led to the current shift in

information retrievals through books to laptops and now to mobile devices which result in Mobile Learning.

Mobile Learning devices include devices that can make and receive calls over radio link, iPod-the great apple device used for playing and storing music, photos and much more, Mp3player-an electric device that can play digital audio file, personal digital assistant-handheld devices that can combine elements of computing telephone/fax, internet, and networking in a signal device, Ultra Mobile devices Pc, Smartphones, Tablet Pc. These digital devices can efficiently process information at a fast rate. The implication is that many of their applications (apps) can be easily assessable. They include among others, SMS, cell phones games, video, video conferencing, video teleconferencing, chatting, podcasting, television. Implying that, with the acquisition of the Mobile Learning technologies, all these apps can be utilized for learning purposes.

In addition, the availability of these mobile and wireless devices is to enable people to communicate in different ways, to the extent that mobile communications are no longer restricted to companies that can afford the large investment in hardware and specialized software. Presently, individuals have easy and inexpensive access to mobile telephones and the cost of mobile access to the internet is rapidly reducing. Mobile technologies have largely affected the way of communicating. This is typified by young people, for whom mobile communications are part of their normal daily interaction, who is 'always on' and connected to geographically-dispersed friendship groups in 'tribal' communities of interest. Peters (2007) [8].

The depth of penetration of mobile technologies globally is well captured in Killian (2011), [6] where he stated that half of Africa's one billion populations have mobile phones. He further said that mobile technologies have had a positive effect in increasing the digital inclusion statistics and provides a medium for those with low self-efficacy in ICT to access the internet. Bryant (2006) sees mobile technologies as tools to "expand the discussion beyond the classroom and provide new ways for students to collaborate and communicate within their class or around the world.''

Consequently, as Thomas (2005) [14] stated, ''through the application of mobile technologies within the learning design, students can be further empowered to undertake 'user-led education', creating their own content and collaborating with peers and communities within and beyond the classroom.'' Invariably, the application of mobile technologies within learning design increases the learner's motivation and engagement.

According to Rafiu, Kayode and Raphael (2011), ''mobile learning 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 mobile learning paradigm, its implementation in the developing world encounters a lot of hitches.'' These challenges range from technological, attitudinal, curriculum and pedagogy, instructional readiness, teacher/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 (individuals born before the existence of digital technologies)' and 21st century illiterates, which according to Alvin (2012) [2], 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, some have computer phobia while others might be looking at the retirement age being closer hence learning a 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 mobile learning are technical, social and educational problems. The Technical challenges include among others, the problems of connectivity and battery life, screen size, meeting required bandwidth for non-stop/fast streaming, number of files format supported by a specific device, multiple operating systems, limited memory, and 'Digital divide,'' who has the purchasing power, how to access learning outside the classroom, how to support learning across many contexts, developing an appropriate theory of learning for the mobile age, design of technology to support a lifetime of learning, tracking of results and proper use of this information, including the ''risk of distraction'' in use Mobile Learning system device. security. Furthermore, a few social and educational challenges may include, accessibility and the purchasing power of the end users with the result of creating the unfortunate problem of ''Digital divide.'' Invariably, Mobile learning has enhanced upon e-learning by taking it a step further and allowing students to learn virtually anywhere a mobile signal is available (Rick, 2012) [10]. Besides many students of the University of Port Harcourt own mobile phones and may also have their own challenges, and that is the essence of this study.

Although, the concept of mobile learning is still emerging and still very unclear but how it is conceptualized will be determined by the perceptions and expectations, of different stakeholders. There are different stakeholders and factors at work in this process of conceptualizing mobile learning and the outcome is uncertain. Certainly, learning in institutions have been shaped as well as influenced by the various types of technologies that have been witnessed in the past and present. The traditional method for instructions were textbooks during the paper-based dispensation, now in the technology era, the acquisition of knowledge is depicted as a process that is mediated by a device. These emerging technologies pave the way to the progress of numerous prospects that enhance the learning process in such a manner that was not possible before now.

The internet has provided opportunities for communication and by extension made the learning experience better (Sharples, 2000) [11]. The traditional way of classroom lectures, acquiring information via the use of books at the library has been made easier in higher institutions of learning by the advent of e-learning. In recent times, the evolution of mobile phones which come in various shapes, sizes and functionalities has further enhanced learning in various ways Eloho (2013). This predominance of mobile phones and its importance will outnumber the use of personal computers and other previous devices (Sharples, Taylor and Vavoula (2005) and (Kalba, (2008). This development has led to a current shift in information retrieval via books, to laptops and now to mobile devices which results in mobile learning.

The concept of mobile learning is facilitated by mobile devices. Mobile learning according to Sharples and Jeffery (2002) [12] ''is an emergent paradigm in a state of intense development fuelled by the confluence of three technological streams: ambient computing power, ambient communication and development of intelligent user interfaces.'' Quinn (2007) defined mobile learning as the intersection of mobile computing (the application of small, portable and wireless computing, and communication devices) and e-learning (learning facilitated and supported through the use of information and communication technology).

Mobile learning is that which takes place via such wireless devices as mobile phones (devices that can make and receive telephone calls over a radio link while moving around a wide geographical area), iPod (great Apple device used mainly for playing and storing music, photos and much more), Mp3 player (an electronic device that can play digital audio files), personal digital assistants (handheld devices that combine elements of computing telephone/fax, internet and networking in a signal device), Ultra-Mobile Pc (mini computers or tablets with touch screen and keyboard option), Smartphones (combines both mobile phone and hand held computer to a single device allowing users to store information, install programs, along with using mobile phones in one device), tablet Pc (are a type of notebook computer that has a liquefied crystal display screen on which one can write using a stylus). These digital devices can efficiently process information at a fast rate. This implies that many applications are easily accessible: SMS, cell phone games, video, video conferencing, video teleconferencing, chatting, podcasting and television. The employment of a specific type of technologies is the only thing that differentiates mobile learning from other forms of learning.

However, the advancement from the usual paper and textbook kind of learning into the use of mobile devices for academic learning purposes is not all rosy as they are accompanied by an array of challenges. According to Rafiu, Kayode and Raphael (2011) mobile learning 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 mobile learning paradigm, its implementation in the developing world encounters a lot of hitches. These challenges range from technological, attitudinal, curriculum and pedagogy, instructional readiness, teacher/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 (individuals born before the existence of digital technologies)' and 21st century illiterates, which according to (Alvin, 2012) [2] 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, some have computer phobia while others might be looking at the retirement age being closer hence learning a new skill is not worthwhile. So, 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 mobile learning are technical, social and educational problems. Technical challenges include- connectivity and battery life, screen size and key size, meeting required bandwidth for non-stop/fast streaming, number of files/ asset format supported by a specific device, multiple operating systems, limited memory, and security. Social and educational challenges include – accessibility and cost barriers for end users: Digital divide, how to access learning outside the classroom, how to support learning across many contexts, developing an appropriate theory of learning for the mobile age, design of technology to support a lifetime of learning, tracking of results and proper use of this information, Risk of distraction.

Alongside the benefits, Mathew, (2015) [7] was of the view that mobile devices certainly come with their share of complications. For instance, teacher authority is one area that can be easily undermined when mobile technology is allowed in classrooms. In spite of that, one of the benefits of mobile devices in classrooms is that they allow simultaneous work to take place but that does not infringe on the teacher's lesson plan which some teachers are afraid of rather they should be trained on hoe to integrate ICTs into their lesson plans.

Another challenge that teachers and parents may encounter with the student and children/wards is the fact that Tech policies may be more difficult to implement on personal electronics than ones owned by the schools or colleges because a tablet that is owned by a particular school, for example, can come pre-installed with the right programmes and apps and would block any unnecessary programmes whereas a device that is owned by a student may not have the same rules. There are also privacy issues to consider, too, especially now that tracking cookies are so prevalent on personal mobile devices. These and more are some of the problems that need to be considered and control in the utilization of Mobile Learning devices in schools.

David (2015) [3] studied opportunities and challenges of mobile learning in the University of Uyo, Nigeria. Using non-proportional stratified random sampling technique, the researcher drew a sample of 240 students who responded to a survey questionnaire termed mobile learning at the University of Uyo: opportunities and challenges (MLUUOC). The results showed that 80.0% of the students were of the view that mobile devices are expensive, 81.67% of the students were of the view that mobile devices have short battery lifespan, 75% of the students experience poor network connection when they try to use their mobile devices for learning. While David (2015) [3] used a non-proportional stratified random sampling technique to draw its respondents, the present study will use the simple random sampling technique. Though David (2015) [3] study was conducted at the University of Uyo, the present study will be conducted at the University of Port Harcourt. Similar descriptive statistics will be employed to analyze the questionnaire.

In a related study, Francis, Clive and Jey (2013) [4] studied prospects and challenges of mobile learning implementation in Nigeria. Using non-proportional stratified random sampling technique, the researchers drew a sample of 80 lecturers that responded to a survey questionnaire. The results showed that 75% of the respondents are of the view that poor learning environment is a barrier to mobile learning. 70.1% of the respondents agreed that security issues pose a barrier to the successful implementation of mobile learning. 64% of the

respondents attributed poor power situation in the country as a barrier to mobile learning implementation. While Francis *et al*. (2013) [4] used a non-proportional stratified random sampling technique to draw its respondents; the present study will use the simple random technique to draw its sample from the population. Though Francis *et al*. (2013) [4] study focused on educators, the present study will focus on students. Similar analysis technique will be used to analyze the questionnaire.

Statement of the problem

Generally, Mobile learning can make a positive difference in how students learn especially when used in the right way. It has the potential to help students learn more and understand what they are studying. In this 21st, ''the digital age,'' it is expected that every student should have his or her own mobile device that syncs information between school and home or as you go so that the students can make a significant gain in their academics, unfortunately, many developing countries are yet to get to that level.

Besides, the problems facing learning through the use of mobile devices is beyond owning mobile devices need more than technology to be fixed. Competent, professional is very important than ever in this information age to balance mobile educational benefits with effective instructional interactions with the students. It is in this bid that this study focuses on student learning and student success, the purpose of this paper is to provide a review of the challenges teachers, students and the various academic institutions face in the use of Mobile devices for academic learning purposes. Hence, this study which is centred on the problems and prospects of the use of mobile learning devices for learning purposes in the Department of Curriculum Studies and Educational Technology, Faculty of Education, University of Port Harcourt

Purpose of the Study

The main purpose of this study is to evaluate the problems and prospects of mobile learning in the Department of Curriculum Studies and Educational Technology, Faculty of Education, University of Port Harcourt.

In specific terms, the study intends:

1. To identify possible challenges students encounter while using their mobile learning devices for academic purposes.
2. To identify the possible ways to improve on the challenges students encounter while using their mobile learning devices for academic purposes

Research Questions

The following research questions will be answered to obtain the findings or results of the study:

1. What are the possible challenges students encounter while using their mobile learning devices for academic purposes?
2. What are the possible ways to improve on the challenges students encounters while using their mobile learning devices for academic purposes?

Materials and Methods

Design

The design of the study was the descriptive survey as data was collected from a sample of students in order to answer questions concerning the problems and prospects of using mobile learning devices for academic purposes.

Population, sample and sampling technique

The population of the study consists of all undergraduate students in the department of curriculum studies and educational technology, Faculty of Education, University of Port Harcourt with an estimated figure of 480 undergraduate students.

Sample and Sampling Techniques

A sample of 100 undergraduate students in the department of curriculum studies and educational technology, Faculty of Education, University of Port Harcourt was used for the study drawn using the simple random sampling technique. The 100 undergraduate students constitute the respondents for the study.

Instrumentation

The instrument for data collection of this research work was through the use of a carefully designed 16-item questionnaire. The questionnaire was constructed in such a way that would be relevant to the research questions stated earlier in this work. The questionnaire was divided into section A and B. Section A contained personal information about the respondent, while section B was on general data intended to elicit information from the respondents. The reliability of the instrument was determined through the Cronbach alpha reliability method to obtain a reliability coefficient of 0.72.

Method of data collection

Copies of the instrument were administered to the respondents by the researcher. Instructions guiding the filling of the questionnaire were explained to the respondents. The researcher supervises the filling of the questionnaires and retrieves filled copies on the spot.

Data Analysis

The research questions were answered using mean and standard deviation while the hypothesis was tested using regression analysis at 0.05 level of significance

Result

Research question 1

What are the possible challenges students encounter while using their mobile learning devices for academic purposes?

Table 1: Mean Rating and Standard Deviation on the Possible Challenges Students Encounter While Using Their Mobile Learning Devices for Academic Purposes

		N=100						
SN	**Challenges of mobile learning devices**	**SA**	**A**	**D**	**SD**	**Mean**	**SD**	**Decision**
1	Mobile devices are expensive	52	34	9	5	3.33	0.83	+
2	It is time consuming	37	20	30	13	2.81	1.07	+
3	It has short battery life span	55	34	9	2	3.42	0.73	+
4	Mobile devices are cheap	4	10	38	48	1.7	0.81	*
5	It has low memory space	54	13	19	14	3.07	1.13	+
6	It is boring while learning with it	11	18	29	42	1.98	1.02	*
7	Mobile devices has long battery life span	1	10	40	49	1.63	0.7	*
8	It has small screen size	13	35	20	32	2.29	1.05	*
9	It experiences poor network connection	57	30	11	2	3.42	0.76	+
10	I lack the manipulating skills	2	11	38	49	1.66	0.75	*
	Grand mean					2.53	0.76	+

Key: +Accepted, *Rejected

Table 1 shows that the mean and standard deviation of the possible challenges students encounter while using their mobile learning devices for academic purposes was 2.53, SD=0.76. The key challenges of using mobile learning devices for academic purposes was that it has short battery lifespan (M=3.42, SD=0.73). This was followed by the fact that mobile learning devices are very expensive (M=3.33, SD=0.83), while the least was that it is time-consuming (M=2.81, SD=1.07).

Research question 2

What are the possible ways to improve on the challenges students encounters while using their mobile learning devices for academic purposes?

Table 2: Mean rating and standard deviation on the possible ways to improve on the challenges of using mobile devices for learning purposes

		N=100						
SN	**Solutions to challenges of mobile learning**	**SA**	**A**	**D**	**SD**	**Mean**	**SD**	**Decision**
1	Provision of free internet connectivity in the school	57	43	-	-	3.57	0.49	+
2	Constant power supply	87	13	-	-	3.87	0.34	+
3	Low subscription rates for online courses	65	33	2	-	3.63	0.52	+
4	Provision of learning materials	47	48	3	2	3.40	0.65	+
5	High subscription rates for online courses	-	-	45	55	1.45	0.5	*
6	Epileptic power supply	-	-	43	57	1.43	0.5	*
	Grand mean					2.89	1.13	+

Key: +Accepted, *Rejected

Table 2 shows that the mean and standard deviation on the possible ways to improve on the challenges of using mobile devices for learning purposes was 2.89, SD=1.13. The key possible solution to the challenges was the constant power supply (M=3.87, SD=0.34). This was closely followed by low subscription rates for online courses (M=3.63, SD=0.52) while the least was the provision of learning materials (M=3.40, SD=0.65).

Discussion of Findings

The discussion of the findings of this study was done under the following sub-headings:

Possible challenges students encounter while using their mobile learning devices for academic purposes

Findings from this study as shown in Table 1 shows that the mean and standard deviation of the possible challenges students encounter while using their mobile learning devices for academic purposes was 2.53, SD=0.76. The key challenges of using mobile learning devices for academic purposes was that it has short battery lifespan (M=3.42, SD=0.73). This was followed by the fact that mobile learning devices are very expensive (M=3.33, SD=0.83), while the least was that it is time-consuming (M=2.81, SD=1.07). This means that a greater proportion of the respondents were of the view that mobile learning devices used for academic purposes have short battery lifespan and that mobile learning devices are very expensive. This finding is consistency with that of David (2015) [3], who studied opportunities and challenges of mobile learning in the University of Uyo, Nigeria. Using non-proportional stratified random sampling technique, the researcher drew a sample of 240 students who responded to a survey questionnaire termed mobile learning at the University of Uyo: opportunities and challenges (MLUUOC). The results showed that 80.0% of the students were of the view that mobile devices are expensive, 81.67% of the students were of the view that mobile devices have short battery lifespan, 75% of the students experience poor network connection when they try to use their mobile devices for learning.

In a related study, Francis, Clive and Jey (2013) [4] studied prospects and challenges of mobile learning implementation in Nigeria. Using non-proportional stratified random sampling technique, the researchers drew a sample of 80 lecturers that

responded to a survey questionnaire. The results showed that 75% of the respondents are of the view that poor learning environment is a barrier to mobile learning. 70.1% of the respondents agreed that security issues pose a barrier to the successful implementation of mobile learning. 64% of the respondents attributed poor power situation in the country as a barrier to mobile learning implementation.

Possible ways to improve on the challenges students encounter while using mobile devices for learning purposes

According to the findings of this study as was shown in Table 2 shows that the mean and standard deviation on the possible ways to improve on the challenges of using mobile devices for learning purposes was 2.89, SD=1.13. The key possible solution to the challenges was the constant power supply (M=3.87, SD=0.34). This was closely followed by low subscription rates for online courses (M=3.63, SD=0.52) while the least was the provision of learning materials (M=3.40, SD=0.65). These findings implied that majority of the respondents favoured constant power supply and low subscription rates for online courses. This finding is in agreement with the views of Sharples, (2000) [11] who opined that internet can provide opportunities for communication and by extension made the learning experience better if the authorities can make certain facility provided for the students to enhance learning through the use of mobile devices for learning purposes. The traditional way of classroom lectures, acquiring information via the use of books at the library has been made easier in higher institutions of learning by the advent of e-learning. In recent times, the evolution of mobile phones which come in various shapes, sizes and functionalities has further enhanced learning in various ways Eloho (2013). This predominance of mobile phones and its importance will outnumber the use of personal computers (Sharples, Taylor and Vavoula 2005) and other previous devices (Kalba, (2008). This development has led to a current shift in information retrieval via books, to laptops and now to mobile devices which results in mobile learning. Anuj *et al*. (2010), were of the view that more reliable electricity is associated with greater phone use, which could potentially translate into higher learning gains from mobile learning. Adil, (2015) argued further that internet for schools program continue to create a platform for students to unlock their potential.

Conclusion

Although, the use of mobile devices for mobile learning purpose has many challenges which range from high cost of mobile devices, short lifespan of device batteries, low memory space, time consuming etc., these challenges can be reduced and learning enhanced if there is provision of free internet connectivity in the school, constant power supply, provision of learning materials and low subscription rates for online courses. The implication of the established finding is that there appears to be a link between the problems and prospects of using mobile devices for learning purposes.

Recommendations

Based on the findings of the present study the following recommendations were made:

1. Government through the various school authorities should ensure that there is constant power supply at all times as these devices cannot operate without electrical power.
2. Authorities of various institutions of higher learning should assist in proving some mobile learning facilities like free internet access so as to encourage mobile learning among students and teachers.

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