EFFECT OF BLENDED MOBILE PHONE APPLICATION ON ACADEMIC PERFORMANCE OF ADULT LITERACY LEARNERS IN ONDO STATE

AYELAGBE, SINA OPEOLUWA (PH.D) & KAREEM, IBRAHIM AHMED (PH.D)
Department of Educational Technology,
Adeyemi College of Education Ondo, Ondo State, Nigeria.
Department of Curriculum and Instruction, School of Education,
Federal College of Education (Special) Oyo, Oyo State, Nigeria.
E-mail: oayelaabge@yahoo.com & iaabdulkareem2009@gmail.com
Phone No: +234-803-370-3168

Abstract
The study investigated the application of blended mobile phone application on academic performance of adult literacy learners in Ondo State. It addressed three research questions and three hypotheses using a quasi-experimental, pretest- posttest control group design. Sixty (60) adult literacy learners (twenty (20) for control and twenty (20) each for the two (2) experimental groups) were purposively sampled from Ondo State for the study. The two research instruments designed for the study was validated by experts from Department of Educational Technology University of Ilorin and Psychometric using the Cronbach's Alpha which yielded 0.96 and 0.80 respectively. Mean and standard deviation was used to analyse hypothesis one and t-test statistical analysis was used to test hypotheses two and three. The three hypotheses were derived from the three research questions. All hypotheses were tested at 0.05 level of significance. The study revealed that, there was significant difference in the performance of adult learners exposed to Blended Mobile Phone Application (BMPA) and conventional teaching method for learning basic literacy and numeracy skill. Male adult learners using blended Mobile Phone Application performance significantly better than the female t (20) = 2.476, P<0.065., and there was significant difference between the performance of adult learners in urban and rural areas exposed Blended Mobile Phone Application. t (20) = 3.702, P<0.05 in favor of urban learners. Based on the findings, it was recommended that adult basic and post literacy curriculum should be reviewed to incorporate the use of blended MPA for learning, and primers should be written to incorporate the use of blended mobile phone application for effective teaching/learning process.

Introduction
Information and Communication Technology (ICT) has distributive power to organise and develop information, allowing the students to ask questions, receive answers, take in findings and use a broad range of resources for information. Through ICT, students can develop a courageous attitude to their work by using real and relevant data and presenting work in a polished available format. A positive experience of ICT in the classroom, developing student's self-confidence in working as individual and with others, should contribute to the broad quality of their learning (Loveless, 2011). Onasanya (2009) enumerated some of the uses of ICT in the university system as a guide to lecturers in exploring new frontiers in the basic and fundamental research. ICT facilitates research in any discipline as it can be utilized for mathematical and statistical calculations; and provides researchers with timely and immediate avenue for the distribution of research reports and findings. Information and Communication Technology has become a global occurrence of great significance and concern in all spheres of human behaviour, especially in the educational sector. Yusuf and Onasnaya (2009) opine that, for teaching and learning to be more effective, it is essential that ICT allows for students' participation in the learning process to enhance teamwork, more self-study- a self-education-oriented teaching and learning.

The hallmark of ICT is their distributive power and ability to reach a large number of learners in different locations. To meet new adult literacy challenges in present-day Nigeria, particularly in Ondo State is indispensable. Through ICT, basic education, skills and knowledge can be made available to adult learners who cannot be reached by the existing system of education (Andrew, 2004). United National Educational, Scientific and Cultural Organization (UNESCO) (2006) enumerated some of the technological tools currently utilized in the teaching-learning process. Such technological resources are audio devices, video, television and radio broadcasts, computers, internet, database, fax, e-mail, mobile phone, network and online libraries.

There are obvious definitions and conceptualization of mobile learning or m-learning, purely in terms of technology and hardware, suggesting it is learning delivered or supported only or mostly by hand-held and mobile technologies such as personal digital assistants (PDAS), smart-phone or wireless laptop PCS (Traxler, 2009). Furthermore, it is defined as any service or gadget that supplies a learner with broad electronic information and learning content that aids the attainment of knowledge regardless of locality and time (Lehneer & Nosekabel, 2011).

Vavoula and Sharples (2010) suggested three traditions in which learning can be considered mobile learning. It is mobile in terms of space; different areas of life; with respect to time. These assertions imply that mobile learning system should deliver learning content anytime and anywhere the learners need it.

Mobile learning is seen as present solutions to several challenges presently facing the education sector, especially adult literacy education. According to Kismohok (2008) mobile learning can develop the quality of learning by: providing contact to a range of resources and equipment which may not otherwise be available, for example graphic, sound, animation, and multimedia, giving power to students over when and where they study, providing a student centered education atmosphere which can be adopted to meet the education of individual student, providing striking multimedia learning without any tutor, making it easier to adjust and renew materials. Also, creating an atmosphere that promotes on active advance to learning, dropping learning time, providing time for more energetic, appealing and interactive forms of learning. And supporting better communication between teachers and students, as well as amongst students, providing regular and timely individual response. For example, through computer-assisted and positive reinforcement, motivating students through the suitable use of interactive courseware, supporting and cheering collaborative learning, supporting economic revenue of high-quality costly resources, Also, encouraging students to take accountability of their learning, so the relevance of mobile learning is that it been used by both male and female for obtaining instructional contents irrespective of their locations (kismohok, 2008). Mobile phone has various features that support research. Features such as game or a camera, among others, it can also be used for accessing and browsing the internet; mobile phone may also include computer programs for word processing or spreadsheets. It can be used to check e-mail or access the document and some of the mobile phones has full-size keyboard as features. (1), other features included on the mobile phone are a video, game, player, and short message service (SMS) among useful applications.

Short message services (SMS) as a communication device, has been seen as an everywhere, immediate, convenient, unobtrusive, and cheap mode of communication. It can be used as learning support device. SMS can be used to send information related to a learning content for student (Mellow, 2005). Mellow (2005) highlighted three modes in which SMS can be used to send educational content. First, the push mode involves the instructor sending

instructional SMS to the students. Second, the pull mode, in which students order specific instruction SMS through pre-specific electric or paper list of content and the interactive mode, in which the instruction question are pushed by the instructors or pulled by the students. Then answer and response could be exchanged between the student and the instructor (Mellow, 2005).

Mobile technology is calculated as the next form of e-learning using mobile phones to enable teachers and learners to perform their learning process anytime. Alzaza and Yakubu (2011) carried out a study on students' awareness and necessities of mobile phones in higher learning environment. The study found that the higher education environment now has the necessary mobile technology infrastructure to use mobile phone. The result of the study showed that students have adequate knowledge and good awareness to use the mobile phones in their classroom environment. It was noted that students use mobile phone application individually to check the examination result, course registration and keep in touch with their classmates and lecturers. Mobile phone can help adult learners for learning basic literacy and numeracy skills in their various study centers. This study, effect of mobile application on academic achievement of adult literacy learners would therefore, enable learners to integrate the use of mobile phone application as a supplement to face to face teaching, and exposes the learners to the use of mobile phone in sending and receiving message for educational purposes.

Aderinoyo, Ojokheta and Olojede (2007), revealed that teaching and learning in adult literacy programmes are characterized by the conventional method of teaching where the instructor dominates the class (teacher centred), while the learners remain passive. This does not give room for effective interaction, thereby leading to a poor attitude of adult learners towards learning.

The radio broadcasts were used to supplement the face-to-face interactive sessions with the learners. Learners were to listen to radio twice in a week and meet at a specific time and location with specifically designed primers that used diagrams and sign to guide learners in acquiring literacy and numeracy skills in the language of the environment with the facilitators at the centre locations (Champion, 2010).

The location of the learner, whether urban or rural is expected to have certain effects on the performance of adult literacy learners due to the differences in organizational and social environment as well as resources available (Hannaay & Talber, 2012). The educational inequality in urban areas suggests that large achievement gaps could exist between the learners in these centres and their peers in rural centres because of the environmental and infrastructural facilitates in urban setting (Kozol, 2008; Lee, 2011).

On gender, studies such as Asuquo and Onasanya (2009) stress the view that gender differences predict academic outcomes in favour of the male adult learners and students' achievement in computer technology instruction. It was revealed that the differences may depend on the unit of study. Boys performed better than girls in graphics design module while girls do better in the broadcasting module. Also, Okeke (2004), Udousoro (2011), and Ezeudu and Obi (2013) concluded that gender differences exist in student achievement in science and other subjects. Adesoji (2002) also gave three explanations as identified by most studies in Euro-America region on gender difference; these are biological, social and psychological. Muhammet (2010) stated that gender bias in education dates back to the colonial period when the only minority of upper- and middle-class female students have access to formal education. It was reviewed that the male performed better than the female

in terms of the academic outcomes. Therefore gender is considered in this study as a moderating variable.

Phone has various features that support research. Features such as game or a camera, among others, it can also be used for accessing and browsing the internet; mobile phone may also include computer programs for word processing or spreadsheets. It can be used to check e-mail or access the document and some of the mobile phones has full-size keyboard as features. Other features included on the mobile phone are a video, game, player, and short message service (SMS) among useful applications.

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Mobile phone being carried by both literates and illiterates nowadays can be used to solve the problems encountered using radio and television. Mobile phone enables learning to take place anywhere and anyplace. Also, mobile phone can be used to supplement face-to-face interaction with the adult learners. Therefore, this study examined the application of blended mobile phone application on the academic performance of adult literacy learners using Yoruba Language as a medium of communication in Ondo State, Nigeria.

Research Questions

The study sought and provided answer to the following research questions:

(i) To what extent does blended mobile phone application influence academic performance of adult learners in basic literacy?

(ii) Is there any relationship male and female academic performance of adult learners in basic literacy?

(iii) Does urban and rural areas of adult literacy learners influence the academic performance in basic literacy?

Research Hypotheses

The following research hypotheses were formulated and tested at 0.05 level of significance:

HO_1: There is no significant difference in the performance of adult learners taught basic literacy using blended mobile phone application and those taught using conventional teaching method;

HO_2: There is no significant difference in the performance of male and female adult learners taught basic literacy using blended mobile phone application;

HO_3: There is no significant difference in the performance of adult learners in urban and rural areas taught basic literacy using blended mobile phone application.

Methodology

The research design for this study is a quasi-experimental design. It is a pre-test, post-test control group. The population of the study was made up of all adult learners in different study centers in Ondo State, Nigeria. Based on the nature of the research a three – stages sampling techniques was adopted. First, a purposive sampling was adopted to select three study centres in Ondo State. Second, random sampling techniques was used to select two study centres, and 60 Adult learners for the study. Lastly a random sampling technique was used to allocate 20 Adult learners each to the two experimental groups and 20 adult learners to control group.

Blended mobile phone application consisted of alphabets and numeracy which were subdivided into five lessons namely: Alphabets, vowels, consonants, vowels and consonants and numerals. All these were installed in the mobile phones. Blended mobile phone is the main instrument for the actual treatment for the experimental groups. The instrument for data collection was researcher adopted Adult Basic Literacy and Numeracy Academic Performance Test consisting of 25 multiple choice objective items. The instrument was validated by educational technologist experts from Adeyemi College of Education Ondo and Federal College of Education (Special) Oyo, Oyo State, Nigeria and the Blended mobile phone application was given to six computer programme experts from ICT in Adeyemi College of Education, Ondo and Federal College of Education, Oyo. The blended mobile phone application was trial tested on 20 Adult Learners in Oyo Study Centre. Cronbach's Alphas Statistics was use to analyse the responses of adult learners pilot tested which yielded 0.96 and 0.80 respectively. The data for testing the hypotheses was collected from pre-test and post-test administered to the Adult Learners in the study centre. Eighteen weeks was used for teaching and administration of the test. Hypothesis one was tested using mean and standard deviation which was derived from research question one while t-test statistical analysis was used to test hypotheses two and three which was derived from research questions two and three. All hypotheses were tested at 0.05 significant level.

Results

Research question one to three were used to formulate the hypotheses one to three.

Hypothesis One: There is no significant difference in the performance of adult learners taught basic literacy using blended mobile phone application and those taught using conventional teaching method.

Table 1: Estimated Marginal mean on performance of Adult learners taught using mobile phone application, blended mobile phone application and conventional method

Variables		N	Mean	Std. Error
Intercept				
	Pre-Performance	60	38.18	-
	Post-Performance	60	60.00	2.19
Treatment				
	Mobile Phone Application	20	64.96	3.35
	Blended Mobile Phone Application	22	69.07	3.53
	Conventional Method	18	45.92	4.46
Gender				
	Male	27	60.72	3.55
	Female	33	59.28	2.56
Location				
	Urban	34	60.59	3.21
	Rural	26	59.41	2.99

Table 1 reveals that the mean score for the performance of the adult learners before the experiment was 38.18 while it became 60.00 after the experiment. Also, the table reveals the mean scores for the performance of adult learners in the three groups as follows: mobile phone application ($\bar{x}$ = 64.96), blended mobile phone application ($\bar{x}$ = 69.07) and conventional method ($\bar{x}$ = 45.92). The mean scores for both the male and female adult learners are shown as: male ($\bar{x}$ = 60.72) and female ($\bar{x}$ = 59.28). Again, the table shows the mean score of the adult learners from the urban and rural areas as follows: urban ($\bar{x}$ = 60.59) and rural ($\bar{x}$ = 59.41). As it can be seen from the result, there is appreciable difference between the mean value of those in mobile phone application and those in conventional group and, between the mean value of those in blended mobile phone application and those in conventional group. There was no much difference between the mean value of those in mobile phone application and those in blended mobile phone application. However, it can be inferred that there is significant difference among the three groups in their mean scores.

Hypothesis Two: There is no significant difference in the performance of male and female adult learners taught basic literacy using blended mobile phone application;

Table 2: Summary of t-test showing difference in the performance of male and female adult learners taught using blended mobile phone application

Variable	N	Mean	Std. D	df	t-value	Sig(P)	Remark
Performance							
Male	10	76.00	7.24				
Female	12	68.50	6.94	20	2.476	.022	Significant

Table 2 shows the difference in the performance of male and female adult learners taught using blended mobile phone application. The table shows that there is significant difference

between the performance of male and female adult learners taught using blended mobile phone application for learning basic literacy and numeracy skills (df = 20; t = 2.476; p<0.05). Based on this result, hypothesis two is rejected.

Hypothesis three: There is no significant difference in the performance of adult learners in urban and rural areas taught basic literacy using blended mobile phone application.

Table 3: Summary of t-test showing difference in the performance of adult learners in Urban and Rural Areas taught using blended mobile phone application

Variable	N	Means	St.d	df	t-value	Sign (P)	Remark
Performance							
Urban	13	76.00	7.44	20	3.702	.001	Significant
Rural	9	66.00	3.74				

Table 3 shows the difference in the performance of adult learners in urban and rural areas taught using blended mobile phone application. The table shows that there is significant difference between the performance of adult learners in urban and rural areas taught using blended mobile phone application for learning basic literacy and numeracy skills (df = 20; t=3.702; p<0.05). Based on this result, hypothesis 3 is rejected. The adult learners in urban areas performed better than those in the rural areas.

Discussion

The mean and standard deviation result shows that there is a significant difference in the performance of adult learners that were taught using mobile phone application, blended mobile application and conventional teaching method. The findings corroborate Klob (2013) and Jacob (2014) that the experimental group which used short message service (SMS) for writing notes performed significantly better than that control group in both note taking and comprehension that was drawn from the note. This shows that student and teachers were applied of the use of mobile phone in taking notes in the classroom. Also, the finding supports Kismihok (2008) who opined that students have been using mobile phone education activities. Again, it was revealed that the male adult learners had a better level of understanding than the female ones. These findings support Saunders and Quirke (2002) that males made more call and sent more SMS message than females.

The results show that there was no significant effect of gender on the adult learners understanding on the use of the mobile phone application for learning basic literacy skills. It was revealed that the understanding of male and female adult learners differed significantly. This result is in agreement with of Awofala and Anyikwa (2014) who found out that both male and female adult learner have better understanding of the use of application. However, it contradicts the finding of Economides and Grousoupoulou (2008) who found that female take photographic, record sound using the mobile phone than male who used more of computers and the internet. Also, Oladokun (2009) found that female in their various locations were capable of using landline telephone more than any other ICT facilities, while their male counterparts were capable of using all other ICTs. The reason for this difference is that female in both locations was not educated as the men. The finding about male capability of use of other ICTs apart from landline telephone was support by Ugwuegby (2002). Ayelaagbe, (2016) compared the use of mobile phone application, blended mobile phone application and the use conventional method of teaching to teach basic literacy to adult literacy learners in Ondo state. And it was concluded that combination of conventional method and mobile phone application which resulted to blended mobile phone application made learning more effective and concrete in the classroom.

The t-test result show that there was significant difference between the performance of adult learners in urban and rural areas taught using mobile phone with the findings of Akintunde (2004), Falade (2007) and Pyramid Research performance. Adult learners in urban areas performed better than those in rural in the use of blended mobile phone application, because users are concentrated in the cities, while those in rural areas have limited spread of the communication networks and irregular or non-existence of electricity supplies are major barriers of the use of blended mobile phone application in rural areas. Also, the findings of Fahamu (2007) that inadequate power, poor infrastructure and poverty hindered the use of mobile phone by rural dwellers not easy.

Conclusion

Based on the findings of this study, mobile phone application was tested and found effective for learning basic literacy and numeracy skills by adult learners. The adult learners that were exposed to blended mobile phone application performed better than their counterparts taught in the conventional classroom. Equally, gender performance was also recorded because both the male and female learners that were involved in the experiments using the mobile phone application performed equally and the issue of gender influence or difference in learners' performance did not arise.

Recommendations

Based on the major findings of this study, the following recommendations were made:

(i) Instructors/facilitators should be encouraged to make use of mobile phone application in teaching/learning process especially in adult literacy classes.

(ii) National adult basic and post literacy curriculum should be reviewed to incorporate the use of mobile phone applications for learning.

(iii) Primers should be written to incorporate the use of mobile phone application for effective teaching/learning process.

(iv) The national adult basic and Post Literacy Commission should work hand-in-hand with web designers/computer programmers to develop and come out with relevant ICT based instructional strategy like mobile phone application for learning.

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