



**NIGERIAN ONLINE JOURNAL OF
EDUCATIONAL SCIENCES
AND TECHNOLOGY (NOJEST)**

<http://nojest.unilag.edu.ng>

NIGERIAN ONLINE JOURNAL
OF
EDUCATIONAL SCIENCES
AND TECHNOLOGY

**Effect of Mobile Learning App on Undergraduates’
Performance in GNS Through A Blended Learning
Approach**

Koledafe Olawale Sunday
Centre for Open and Distance Learning,
University of Ilorin

Yusuf Mudasiru Olalere
Department of Educational Technology
University of Ilorin

To cite this article:

Koledafe, O. S., & Yusuf, M. O (2021). Effect of mobile learning app on undergraduates’ performance in GNS through a blended learning approach. *Nigerian Online Journal of Educational Sciences and Technology (NOJEST)*, 3(1), Pages 73-79

This article may be used for research, teaching, and private study purposes.

Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

Authors alone are responsible for the contents of their articles. The journal owns the copyright of the articles.

The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of the research material.



Effect of Mobile Learning App on Undergraduates' Performance in GNS through A Blended Learning Approach

Koledafe, O. S., & Yusuf, M. O

Article Info

Article History

Received:
29th July 2020

Accepted:
10 March 2021

Keywords

GNS, use of Library,
Gender, App

Abstract

This study examined the effects of a researcher-developed mobile learning app on performance of undergraduate students in a compulsory general study course in a Nigerian University. Mixed method was adopted in the study. A pre-experimental one group pretest-posttest design was used. The research population involved undergraduates in Nigerian universities. A sample of 21 year-one students, were purposively drawn among University of Ilorin undergraduate students. The group was subjected to pretest, followed by the administration of the treatment and then post-tested. Simple random sampling method was adopted in selecting the experimental group. It was found that there was a significant difference in the students' post-test score after they were exposed to the GNS App. $t(20) = 4.303, p = < 0.05$; and no significant difference was noticed in the male and female students' performance after being exposed to the treatment. The study concluded that the mobile App when used alongside traditional teaching and learning improved students' performance in GNS -Use of Library, irrespective of gender.

Introduction

The 21st century proliferation of digital technology has not only affected the humanity ways of life, but also creating a new paradigm in education. Teaching and learning in various educational classrooms around the world are progressively keeping pace with this technological revolution (El-Abbouri, Hildebrandt, & Puckett, 2014). Learners of the 21st century, being more of digital natives, are no longer comfortable with the traditional education, where learning is restricted to the four walls of the classroom. Jones and Shao (2011) submitted that the gap between students and their teachers is no longer fixed, neither is there a gulf so large that can't be bridged through 21st century computing.

Computing in the digital age has gone from a static, heavy machine, processing instruction at a fast rate, into a slim, simple mobile device, which processes instruction at a faster rate. The exploration in the use of Integrated Circuits (ICs) have enable manufacturers to refabricate the "big heavy machine" into a "small handy" one without being devoid of functionality. Thus, the gaps of accessibility to learning anytime, anywhere has been bridged through mobile learning with the aid of mobile technological devices. (Sarrab, Elgamel, & Aldabbas, 2012).

In its simplest form, mobile learning can be said to be the integration of mobile technology into teaching and learning processes. Mobile learning is a form of learning process delivered or supported by handheld and mobile technologies and which can guarantee learning anywhere and anytime (Laouris & Eteokleous, nd; Robinson & Reinhart, 2014; Traxler, 2007; United Nations Educational, Scientific and Cultural Organization, UNESCO, 2013). More so, the term mobile learning motion to any form of learning that transpires when the learner does not settle at a fixed, predetermined location. It is a form of learning that ensues when the learner key into learning opportunities offered by mobile technologies such as mobile phones and hand-held computers to enhance the learning process (Chanchary & Islam, 2011).

Mobile learning can be conceptualised from three major perspectives; learning delivered and supported by mobile computing devices; learning that is both formal and informal; and context aware and authentic for learners (Gikas & Grant, 2013). Mobile learning is a form of learning that utilize technologies of mobile computing devices such as WiFi, Short Message Services (SMS), GPS (Global Positioning System), and so on, in the delivery of instruction and supports for learners (Peters, 2007). It can be used as a supportive tool within the formal pedagogical learning process, and also as a viable tool in outside-the-classroom learning activities (Lai, Khaddage, & Knezek, 2013). Mobile learning also serve as bridge to gaps between formal and informal learning (Trentin & Repetto, 2013). Mobile learning as a context aware learning tool, provide instructional content to learners based on their history and location, providing a shift from the abstract concept to the contextualized learning (Crompton, 2015).

Mobile learning helps in making learning more interesting, more interactive, widely available and flexible. It's cost-efficiency help students to learn more without traditional barriers. Furthermore, the possibility to integrate mobile learning systems into existing e-learning systems makes it easy to stay in touch with the newest advances made in teaching research (Sarrab, Elgamel, & Aldabbas, 2012). Mobile learning, offers opportunities for learning at any place and at any time thus making learning activities more flexible, accessible and personalisable (Shiyadeh, Rad, & Jooybari, 2013). Mobile technologies give learner new opportunities for improved educational activities in that they can be used across different locations and times (Uden, 2007).

The Ambient Insight rated the continent of Africa to have the highest mobile learning growth rate in the world with the five-year Compound Annual Growth Rate (CAGR) of 38.9% (Ambient Insight, 2013). Nigeria being one of the key drivers of the African growth rate has over the years witnessed a great influx of mobile devices from the developed countries. The country can boast of over 80 million internet traffic pullers, 95% of which is done via smartphones (Ojabo, 2015; Chidiogo, 2015). University of Ilorin, for example, took a giant step on 13th of May 2014, by providing the then fresh undergraduates with a tablet PC each, and the programme is repeated every year for the fresher, implying that all University of Ilorin students from year three to year one, have a tablet PC (University of Ilorin, 2014).

General Studies Programmes (GSP) equip undergraduate students all over the world, with diverse range of study and skills which are useful for the students' development and opportunity to grow, learn, and achieve while in the university and after graduating from the university (Northeastern University, 2009; Study.com, n.d.). The General Studies offer content which is aimed at stimulating and broadening student's awareness and knowledge in relevant fields outside his immediate area of specialization (University of Calabar, 2011).

General Studies Programme (GSP) in Nigeria is an aspect of the educational policy of the country covering a set of identified courses to be of general applicability to undergraduates of universities in Nigeria beyond their normal respective disciplines. The overall aim is to broaden the scope of all students and harness such acquired knowledge to impact positively the development of the country. The General Studies programme has been instrumental to broadening the scope of reasoning and body of knowledge of the young graduates (Ogenyi, 2015). It is an aspect of the educational policy of the country covering a set of identified courses to be of general applicability to undergraduates of universities in Nigeria beyond their normal respective disciplines. The overall aim is to broaden the scope of all students and harness such acquired knowledge to impact positively the development of the country (Ogbeide, 2018)

Historically, GSP was first introduced in 1989 by the National University Commission (NUC) in the Minimum Academic Standard (MAS) curriculum. It was later revised with the addition of entrepreneurship studies to form part of the Benchmark Minimum Academic Standard (BMAS) of the NUC in 2007 (Ogbeide, 2018). The approval of the BMAS made the GSP a compulsory course for all undergraduates in Nigerian universities. Table 1 presents the admission data of selected universities in the North-Central geo-political zone of Nigeria between 2018 – 2019.

Table 1: Number of candidates admitted through JAMB in 2018 and 2019 among selected universities in North-Central geo-political zone, Nigeria

#	Universities	Admitted candidates in 2018	Admitted candidate in 2019
1	UNIVERSITY OF ILORIN, ILORIN, KWARA STATE	12984	11616
2	UNIVERSITY OF JOS, JOS, PLATEAU STATE	8875	7704
3	NASARAWA STATE UNIVERSITY, KEFFI, NASARAWA STATE	6215	5576
4	KOGI STATE UNIVERSITY, ANYIGBA, KOGI STATE	5019	5016
5	FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGER STATE	4935	4775
6	KWARA STATE UNIVERSITY, MALETE, ILORIN, KWARA STATE	4620	4677
7	IBRAHIM BADAMASI BABANGIDA UNIVERSITY, LAPAI, NIGER STATE	3638	3765
8	FEDERAL UNIVERSITY, LAFIA, NASARAWA STATE	2023	2848
9	FEDERAL UNIVERSITY, LOKOJA, KOGI STATE	1656	1906

Source: JAMB
(https://www.jamb.gov.ng/Stats/PERCENTAGE_INCREASE_OF_ADMITTED_FEMALE_STUDENTS_BY_INSTITUTION_12112020.pdf)

From Table 1, University of Ilorin admitted most candidate to its year one programmes followed by University of Jos and Nasarawa State Universities. Each of these massive number of students take for GSP courses every year, in addition to those who had already been on campus. The data revealed an exceptionally large class of students

taking the GSP courses. Therefore, overcrowded lecture room, poor learners' engagement, and boring lectures have characterized the teaching and learning of GSP courses across Nigerian universities. (Ogenyi, 2015). There is therefore an urgent need to review the teaching of GSP courses in Nigeria universities in order to ensure the achievement of the programme goals and objectives. One way of doing this is to leverage on the affordances of Mobile learning application, hence this study.

Research Objective

The main objective of this study is to test the effectiveness of a researcher developed GNS App, a mobile learning application in the teaching and learning of GSP courses in Nigerian universities. Specifically, this study will find out if the app can influence undergraduate students performance with gender as a moderating variable.

Research Question

1. Are there any differences in the performance of undergraduates before and after they are exposed to the GNS App through a blended learning approach?
2. Does gender influence undergraduate students' performance when taught using the GNS App in a blended learning environment?

Hypotheses

Ho1: *There is no significant difference between the performances of undergraduate students before and after they were taught Use of Library using the GNS App through a blended learning approach.*

Ho2: *There is no significant difference in the performance of male and female undergraduates exposed to the GNS App through a blended learning approach.*

Methodology

The study was a pre-experimental design study of one group pretest-posttest design. The design involved an experimental group only, which was given a pretest, then exposed to the GNS-APP, then finally post tested. The design layout is as shown in Table 1.

Table 1: Research Design Layout

Groups	Pre-test	Treatment	Post-test
Experimental Group	O ₁	X	O ₂

O₁ stands for Pre-test for the Experimental Group

O₂ stands for Post-test for the Experimental Group

X Stands for the Treatment (GNS-App) given to the Experimental Group

The population for this study comprised of all undergraduates in Nigerian universities. The study was targeted at 100 level students in University of Ilorin, Ilorin Nigeria. The sample consisted of 21 undergraduate students, who were randomly selected, to make the experimental group. This selection was drawn from selected faculties in the university, containing both male and female students. Two research instruments were used in the course of this research, namely: GNS APP; Student's Performance Test in the Use of Library (SPTUL). The GNS App is a mobile application that run on both Android and Blackberry platforms. The App was designed to teach some selected topics in the Use of Library in the undergraduate curriculum. The design and development of the App was done by the researcher using instructional content adapted from the University of Ilorin's Use of Library Textbook, (one of the Unilorin GNS series) with the permission from the GNS Directorate. The Student's Performance Test in Use of Library (SPTUL) was also designed by the researcher. The test covered all the contents taught with the GNS App and it was used for both the pre-test and the post-test of the experimental group. The test instrument consisted of 20 multiple choice questions with four options ranging from A-D out of which there were three incorrect and one correct answer.

Data were collected with the help of a research assistant. Students were purposively chosen in the selected faculties to make the experimental group. The group was initially pre-tested and the score was kept by the researcher, then the treatment (GNS-App) was administered simultaneously with the conventional lecture room activities. Post-test was administered after a duration of four weeks using the SPTUL, then the score was compared with the initial score gotten from the pre-test.

Research question one was answered using a qualitative approach, while the analysis and interpretation of data obtained through the performance test was carried out using descriptive and inferential statistics. Hypothesis one and two were tested using inferential statistic, paired-sample t-test and independent sample t-test respectively.

Results

Ho1: There is no significant difference between the performances of undergraduate students before and after they were taught Use of Library using the GNS App through a blended learning approach.

To determine whether there was no significant difference between the student's performances before and after they were subjected to using the GNS App in a blended learning environment, the students were subjected to pre-test before being subjected to using the App and they were later post-tested. The scores obtained from both pre-test and post-test by each of the students are presented in Table 2.

Table 2: Scores obtained by students before and after they were subjected to the use of GNS App

Student	Pre-test	Post-test	Gain
1	10	10	0
2	10	13	3
3	11	14	3
4	13	15	2
5	9	15	6
6	9	16	7
7	8	14	6
8	9	16	7
9	10	11	1
10	8	18	10
11	10	10	0
12	14	11	-3
13	11	11	0
14	11	17	6
15	10	11	1
16	14	16	2
17	11	15	4
18	14	15	1
19	15	17	2
20	11	18	7
21	14	17	3
Mean	11.05	14.29	3.24

From Table 2, it can be observed that 21 students took part in the experiment, and a mean pre-test score was recorded at 11.05 while the mean score for the post-test was given at 14.29. Therefore, a mean gain was recorded at 3.24 and this imply that there is an improvement in the students' performance after there were subjected to the GNS App. The scores from both tests were also subjected to t-test statistical tool using the paired sample method and the results are presented in Table 3.

Table 3: T-test result showing the difference in the students' performance in pre-test and post-test

	\bar{x}	SD	df	T	<i>p-value</i>
Post-test – Pre-test	3.238	3.448	20	4.303	0.000

From Table 8, it can be construed that there was a significant difference in the performance of the students' before and after they were exposed to the treatment (GNS App). This is evident in the table, $t(20) = 4.303$, $p = 0.000$ and since the $p\text{-value} < 0.05$ therefore the null hypothesis is rejected.

Ho2: There is no significant difference in the performance of male and female undergraduates exposed to the GNS App.

To determine whether there was significance difference based on gender after the GNS App was introduced, the mean score of the female and male students were compared. The female students have a mean score of 14.2 while the male counterpart score an approximate mean of 14.4 therefore having a mean difference of 0.2 which is very negligible, as showed in Figure 2

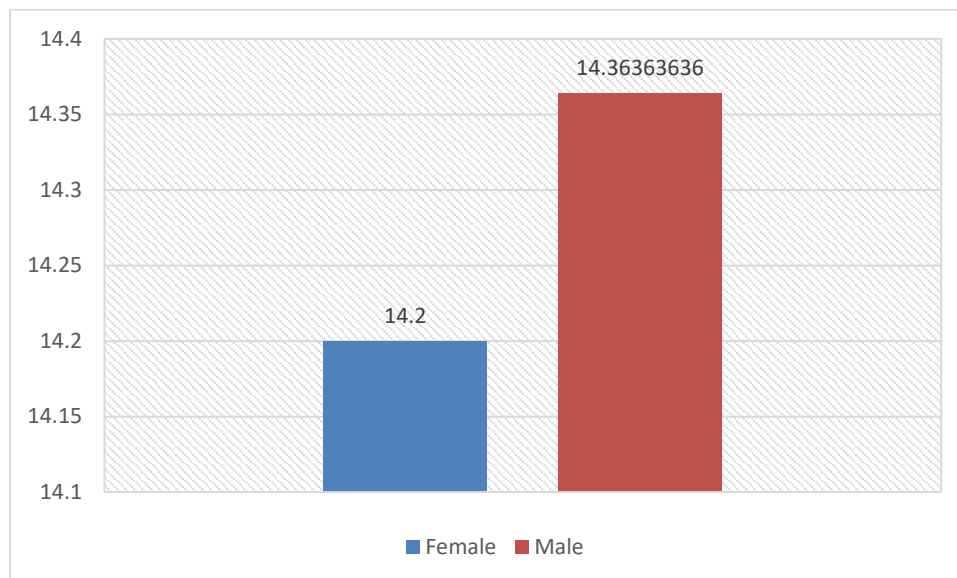


Figure 1: A chart showing the difference in Female and Male students scores after being exposed to the GNS App

More so, to further analyse if there was significant difference between the female and male students' performance after being exposed to the treatment, the post-test result was subjected to statistical analysis using the independent sample t-test at 0.05 level of significance as shown in Table 4.

Table 4: t-test Analysis of undergraduate students' performance based on gender

Gender	N	\bar{x}	SD	df	T	<i>p-value</i>
Female	10	14.20	2.396	19	0.137	0.893
Male	11	14.36	3.009			

From Table 4, it can be observed that there was no significant difference between the performance of male and female students after being exposed to the treatment. This reflected in the result: $t(19) = 0.137$, $p > 0.05$. Therefore, the null hypothesis is not rejected and it can be concluded that there was no significant difference in the performance of both the female and male students exposed to the GNS App, meaning that both male and female students improved in performance after being exposed to the treatment.

Discussions

From the data analysis and results obtained from this study, it was found that there was a significant difference in the students' post-test score after they were exposed to the GNS App. The students performed better in the post-test score than the pre-test score. This finding is in concordance with the earlier findings of Hartnell-Young and Heym, (2008) and Oliver (2005). In both cases, it was found out that use of mobile applications in teaching and

learning enhances students' performance in various subjects at all levels of educations. This finding also agrees with the findings of Vogel, Kennedy, Kuan, Kwok, & Lai (2007), where it was observed that mobile learning app have a positive support for students' performance enhancement.

It was also found that there was no significant difference in the male and female students' performance after being exposed to the GNS App. This is in agreement with the submission of Grimus (2014) where mobile technology was regarded as one of the emerging technologies, which is becoming an integral part of students' life, regardless of their gender.

Conclusions and Recommendations

Mobile learning as a form of Technological Enhanced Learning (TEL), can improve the performance of students when deployed in a blended learning environment. More so, it can be concluded that mobile learning apps are non-gender bias. They improve the performance of both male and female students alike. Thus, making them an important tool in the arsenal of 21st century teachers and educators.

References

- Ambient Insight. (2013). *The 2012-2017 Africa mobile learning market*. www.ambientinsight.com.
- Chanchary, F. H., & Islam, S. (2011). Mobile learning in Saudi Arabia- prospects and challenges. *International Arab Conference on Information Technology*.
- Crompton, H. (2015). Using context-aware ubiquitous learning to support students' understanding of geometry. *Journal of Interactive Media in Education*, 13(1), 1-11. Retrieved from <http://jime.open.ac.uk/articles/10.5334/jime.aq/>
- El-Abbouri, M., Hildebrandt, J., & Puckett, J. (2014, April 24). *The evolution of a twenty-first-century digital classroom*. Retrieved from bcg.perspectives: https://www.bcgperspectives.com/content/articles/public_sector_digital_economy_evolution_twenty_first_century_digital_classroom/
- Federal University Ndufu-Alike Ikwo [FUNNAI]. (n.d.). *General Studies Unit*. Retrieved from Federal University Ndufu-Alike Ikwo: <http://www.funai.edu.ng/general-studies-unit/>
- Lai, K.-W., Khaddage, F., & Knezek, G. (2013). Advancing mobile learning across formal and informal context. *International Summit on ICT in Education*. Retrieved from http://www.curtin.edu.au/edusummit/local/docs/Pre-summit_brief_paper_TWG2_-_Mobile_learning.pdf
- Ogbeide, D. R. (2018). General studies programme and civic education: An examination of Nigeria's experience. *Journal of Public Administration and Social Welfare Research*, 26-34.
- Ogenyi, L. C. (2015). *School of general studies, university of Nigeria, Nsukka*. Retrieved from The Journal of Liberal Studies: <http://jls-online.com/about-us/history-of-the-school.html>
- Peters, K. (2007). m-Learning: Positioning educators for a mobile connected future. *The International Review of Research in Open and Distributed Learning*, 8(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/350/894>
- Sarrab, M., Elgamel, L., & Aldabbas, H. (2012). Mobile learning (m-learning) and educational environments. *International Journal of Distributed and Parallel Systems*, 3(4), 31-38. Retrieved from <http://airccse.org/journal/ijdps/papers/0712ijdps04.pdf>
- Shiyadeh, S. F., Rad, M. R., & Jooybari, M. G. (2013). The effect of mobile learning on the future of learning in Iran. *Research Journal of Applied Sciences, Engineering and Technology*, 6(14), 2668-2675. Retrieved from <http://maxwellsci.com/print/rjaset/v6-2668-2675.pdf>
- Trentin, G., & Repetto, M. (2013). *Using network and mobile technology to bridge formal and informal learning*. Cambridge, UK: Chandos Publishing.
- Uden, L. (2007). Activity theory for designing mobile learning. *International Journal of Mobile Learning and Organization*, 81-102.

University of Calabar. (2011). Calendar 2011-2015. Calabar, Cross River, Nigeria: UNICAL.

University of Ilorin. (2014, May 12). *Students' PC tablets now ready for distribution'*. Retrieved from Univeristy of Ilorin | Better By Far: <http://www.unilorin.edu.ng/index.php/en/component/content/article/237-unilorinnews/3768-students-pc-tablets-now-ready-for-distribution?highlight=WyJ1bmlsb3JpbiIsInRhYmxldCIzInBjIiwidGFibGV0IHBjII0=>

Yusuf, M., Abimbola, I., Fatoba, P., Oyelekan, O., AbdusSalam, N., Oyewumi, K., . . . Sulaiman, T. (2015). *Development of Unilon Nigeria Basic Science Curriculum Apps (Basic 7, 8 and 9)*. A Proposal Submitted to Institution Based Research (IBR).

Author Information

Olawale Sunday Koledafe

**Centre for Open and Distance Learning,
University of Ilorin**

Mudasiru Olalere Yusuf

**Department of Educational Technology
University of Ilorin**
