

Mobile Phones and Students' Academic Performance in Educational Technology

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ABSTRACT

This study was carried out to ascertain the veracity of speculations that the use of Mobile Phones (MP) inhibits students' concentration and academic performance. To this end, the ex post facto design involving 200 out of a population of 867 year three undergraduate students offering Educational Technology (EDU 3101) in the University of Calabar, Nigeria was used to determine the effect of mobile phones on students' academic performance. Two research hypotheses were formulated to guide the study. A well validated 20 item students Utilization of Mobile Phones Questionnaire (SUMPQ) and a 20 item Educational Technology Performance Test (ETPT) were the two instruments used for data collection, with reliability index of 0.68 and 0.66 respectively. Data obtained were analyzed using independent t-test at 0.5 level of significance and 198 degree of freedom. The results of the study showed that the mean score of students exposed to mobile phones was 19.16 against 17.86 for those not exposed to this technology. There was a significant difference in academic performance between high and low frequency users of mobile phones as indicated by the mean scores of 20.18 and 16.06 respectively. From these findings, it is obvious that when responsibly used, this technology provides a "leading edge" for optimal learning. Based on the results, it was recommended that students should be encouraged to constructively use mobile phones as a back-up learning technology to enhance their academic performance.

Keywords: Mobile Phones, Students, Academic Performance, Educational & Technology

Aims Research Journal Reference Format:

Ekpo=Eloma, E.O., Ebuta, C.N & Effiong, A.A. (2016): Mobile Phones and Students' Academic Performance in Educational Technology. *Advances in Multidisciplinary Research Journal*. Vol. 2. No. 4, Pp145-150

1. BACKGROUND TO THE STUDY

Technological advances are sweeping past the world of education significantly altering the processes and settings of instruction. Technologies (beginning from low-cost to the highly sophisticated) are increasingly used in a variety of settings for a variety of reasons, but most especially to enhance a rich, effective and collaborative learning (Heiphetz, 2011). Besides personal computers and laptops, mobile phones have become a more ubiquitous, portable and affordable tool among youths in the acquisition and sharing of knowledge. In the field of educational technology, two broad categories of educational media are integrated into the pedagogical process. The first category falls within the descriptive rubrics of "media-by-design" (MBD) and the second category is "media-by-utilization" (MBU).

Media by design are those media that are originally fabricated specifically to enhance teaching and learning. They include textbooks, educational films, learning modules, instructional games and simulations etc. According to Inyang-Abia (2004), they facilitate purposeful formal learning and evaluation. Media by utilization, on the other hand are those media which are not originally designed for teaching and learning but over time and for obvious reasons have been coopted into the pedagogical process. Examples are radio, computer, television, realia telephones (including mobiles phones). These media are used as coursewares to support and shape learning.

In recent times, telephones (mobile phones) of various configurations and make (Nokia, Techno, Samsung, Erickson, Blackberry) and the network providers like MTN, Glo, Zain, Etisalat, Visafone etc. have been highly patronized especially by students in their daily quest for knowledge. Global systems for Mobile Communication (GSM) started its operation in Nigeria on 7th August, 2001. According to Wikipedia (2010), Africa by 2010 had an estimated 415.3 million subscribers with Nigeria having a total of 18.62 of the total figure. This however, suggests that nearly half of Nigeria's population have access to mobile phones. Some scholars however, maintain that the use of mobile phones inhibits students' concentration and academic performance. According to Katz (1999), the use of mobile phone does not contribute to learning, hence children should not be allowed to use this facility in school. Corroborating the idea, Wallace (1999) maintains that mobile phones constitute a source of distraction, while Kuboy (2001) also asserts that mobile phones adversely affect students' academic performance. For this reason and more, most successive governments including heads of institutions have prohibited the use of mobile phones in almost all the primary and secondary schools in Calabar and Nigeria at large. In most Nigerian universities, students are strongly advised to put off their phones in the course of instruction for maximum concentration.

However, the Federal Republic of Nigeria (2004) strongly advocates the use of innovative instructional materials in the teaching-learning process for improvement of education. Mobile phones constitute such innovative materials and their use in the pedagogical process has been positive. In their study, Chen, Kao and Shen (2003) reported that students who used mobile phone as a tool for learning outperformed their counterparts who refrained. Johson, Bhana and Ur-metzer (2005) and Thornton and Houser (2004) in Tolotunlike (2010) further stated that it can be used to supplement and classroom interaction. That with it, teachers can take notes, pictures, interview and surveys into their mobile phones as they have been found to possess media gathering capacities (Ajileye, 2012).

According to Yusuf (2012), when responsibly used, these media provide "a leading edge" rather than a "bleeding edge" in the teaching-learning process.

Heiphetz (2011), outlines the advantages of mobile phones in teaching and learning to include:

- i. Make contents universally accessible (anytime, anywhere)
- ii. Adapts to students and employee needs
- iii. Increases knowledge, retention and saves time
- iv. Encourages knowledge sharing and gathering
- v. Adapts to the needs of the organization (academia and business).
- vi. Creates best practices.

He further contends that mobile learning provides educational opportunities without forcing learners into bricks-and-mortar classroom experience by personalizing learning schedules. According to Nasmith, Lonsdale, Varoula and Sharples (2013), mobile phones are easily carried about in our pockets or bags for use in addressing specific curriculum areas. And that, they have an enhanced capabilities for rich social interactions, context awareness and internet connectivity. The behaviourists maintain that learning can be reinforced through the association of a particular stimulus and a response. Thus, mobile phones stimulate activity and learning, more than ordinary words of mouth and hours of classroom sermonization. Attewell (2005) further outlines the importance of mobile devices generally for learner-centred learning to include:

- i. Learners can interact with each other and with the particular instead of hiding behind large monitors.
- ii. It is easier to accommodate several mobile devices in a classroom than desktop computer.
- iii. Mobile devices can be used anywhere including homes, in train and allows personalized learning.
- iv. It helps to facilitate individual and collaborative learning experiences.
- v. It can be used to remove some of the formalities which non-traditional learners may find unattractive, frightening and can make learning fun.

Mobile phones have the potentials to enhance effective learning in time and space, especially in a world which is fast shrinking into a global village as predicted by McLuhan.

1.1 Statement of problem

According to the Federal Republic of Nigeria (2004), educational activities shall be learner-centred to develop the practice of self learning and enhance maximum self-development and self-fulfillment. This paradigm shift is achievable, among other things, through the integration of innovative curriculum materials like mobile phones in the pedagogical process. For Sharples (2003) and Kartz (1999), the use of mobile phones constitutes a source of distraction and poor concentration of learners.

It is, however, argued that if this back-up technology (mobile phone) if responsibly used, it will enhance students' academic profile rather than becoming a source of distraction and academic doldrums. Research findings have equally shown that most students fall back on mobile phones for research, facts findings, calculations and collaborative learning in all subject areas (Serno and Karmel, 2011). The use of mobile phones like most other technologies has the potentials to individualize learning, ensure productive interactivity and provide opportunity for access to educational materials irrespective of disability or geographical restriction (Yusuf, 2012). Ajileye (2012) maintains that GSM phones have in-built facilities like internet access, games, calendar, calculators, stop-watch, countdown timer, pictures editor, composer, reminders and alarm clock, which can be utilized for educational purposes. In spite of this fluidity, most governments and school administrators have slammed down on the use of mobile phones in schools because of its perceived systemic danger on students' goal-seeking effort. This study examines the effect of use of mobile phones on students academic performance in the University of Calabar, Cross River State, Nigeria.

1.2 Purpose of the study

The purpose of this study is to examine:

- i. The effect of use of mobile phones on undergraduate students' academic performance.
- ii. The effect of frequency of use of mobile phones on undergraduate students' academic performance.

1.3 Research questions

The following research questions were generated to guide the study.

- i. What is the effect of the use of mobile phones on undergraduates students' academic performance?
- ii. How does undergraduates students frequent use of mobile phones influence their academic performance?

1.4 Research hypotheses

The following hypotheses were formulated to guide the study.

1. There is no significant effect of use of mobile phones on undergraduate students' academic performance.
2. There is no significant effect of frequent use of mobile phones on undergraduate students' academic performance.

2. METHOD

The following research design, procedures and strategies were adopted in the course of carrying out this study.

2.1 Research design

The ex post facto research design was adopted for the study. This is because the event under consideration had occurred and the researchers intend to examine the effect of mobile phones on undergraduate students' academic performance using questionnaire and performance test for data collection.

2.2 Study area

This study was carried out in the Faculty of Education, University of Calabar, Calabar. The University is located in Cross River State of Nigeria. It was established by a charter to produce high level manpower in the critical sectors of the economy. It is one of the foremost second generation Universities in Nigeria and has made giant strides in the areas of teaching, research and community service. The faculty of education is made up of seven departments, at the time of this study, as shown in Table 1 and more departments are being contemplated in the not too distant future.

2.3 Population of the study

The population of the study is made of 867 year three undergraduate students offering (EDU 3101) Educational Technology as a compulsory faculty course in the first semester of 2012/2013 academic session.

2.4 Sampling technique

The stratified random sampling technique was adopted in the selection of the respondents. One of the three researchers took advantage of his status as lecturers in the faculty and course lecturer of Educational Technology

(EDU 3101), a faculty wide course to use the students for this study. However, the selection of 200 students was done randomly. First, the entire Faculty of Education was stratified into departments which are seven in number. Based on the enrolment of students into these seven departments, one of the researchers who coincidentally doubles as the course lecturer of Educational Technology (EDU 3101) called for research assistant volunteers, department by department, according to the number on the table above.

2.5 Sample

The sample consisted of 200 third year undergraduate students of the 2012/2013 academic session offering Educational Technology (EDU 3101) semester course. A total of two hundred (200) undergraduate students out of a population of eight hundred and sixty seven (867) students were sampled. Of this sample, 104 were males and 96 females as shown in the Table below.

Table 1: Showing distribution of sample used for the study.

S/No	Department	Male	Female	Total
1.	Adult Education	14	14	28
2.	Curriculum and Teaching	18	14	32
3.	Educational Administration and Planning	15	14	29
4.	Edu. Foundations, Guidance and Counselling	14	13	27
5.	Human Kinetic/Health Education	13	14	27
6.	Library and Information Science	14	14	28
7.	Vocational/Special Education	16	13	29
	Total	104	96	200

(Field Survey, 2014)

2.6 Instrumentation

Two instruments were used for data collection namely a 20-item Students' Use of Mobile Phones Questionnaire (SUMRQ) and also a 20-item Educational Technology Performance Test (ETPT). The questionnaire consisted of sections A and B. Section A ferreted responses on students demographic information – age, sex, year of study, department etc. Section B elicited information on the use and frequency of use of mobile phones in the pursuit of their academic endeavours. The 20 item performance test consisted of one correct option and three detractors on utilization of mobile phones.

2.7 Validation of instruments

The two researcher designed instruments were presented to two Professors in the Faculty of Education for face, content and construct validation. In the final analysis, items that were adjudged to validity measure what was intended to be measured were retained, while irrelevant ones were discarded. The modifications effected by these experts attested to the validity of the instruments.

2.8 Reliability of instrument

The instruments were pilot-tested on 30 students 300 level undergraduate students from the population but who were not involved in the actual study. Data obtained were subjected to item split half and analyzed using Spearman Brown's prophecy formula to obtain a reliability coefficients of 0.76 for the questionnaire and 0.73 for the performance test.

2.9 Administration of instrument

The two instruments were administered shortly after the normal class for a period of 20 minutes. Coincidentally, that class was a revision class in readiness for the first semester examination. The researcher personally supervised the distribution and collection of the instruments and a 100% return rate was recorded.

3. RESULTS AND DISCUSSION

The results of the study are presented hypothesis-by-hypothesis as follows.

Hypothesis one

The hypothesis states that there is no significant effect of the use of mobile phones on undergraduate students' academic performance. To test this hypothesis, independent t-test statistics was applied at 0.05 level of significance and 198 degree of freedom and the result presented in Table 2.

Table 2: Summary of independent t-test analysis of the effect of mobile phones on students' academic performance (N=200)

Variables	\bar{X}	SD	t-value
Usage of mobile phones	19.16	2.03	4.64
Non-usage	17.86	1.99	

Significant at .05 level, df = 198, critical t= 1.96

The result of the analysis as presented in Table 2 reveals that the calculated value of 4.64 is greater than the critical t-value of 1.96 at .05 level of significance and 198 degree of freedom. The result further shows that the mean score of students exposed to the use of mobile phones (19.06) to be greater than those not exposed to its use (17.86). Thus, the null hypothesis has been rejected in favour of the alternate. This implies that students exposed to the use of mobile phones in the process of learning performed significantly better than their colleagues without such exposure.

The result of this study negates the positions of Katz (1999) and Wallace (1999) that the use of mobile phones does not contribute to learning but rather a source of distraction. It, however, corroborates the findings of Chen, Kao and Shun (2003), that students exposed to the use of mobile phones as a back-up technology for learning out-performed their colleagues who refrained from using it. According to Nasmith, Lonsdale, Varoula and Sharples (2013), mobile phones help address specific curriculum areas. That is why Yusuf (2012), asserts that when responsibly used, the media provide a leading ledge rather than "bleeding edge" in the teaching-learning process.

Hypothesis two

This hypothesis states that there is no significant effect of frequent use of mobile phones on undergraduate students' academic performance. To test this hypothesis, only the scores of students exposed to the use of mobile phones (100) were compared to determine the effect of frequency of use (high and low) of mobile phones on students' academic performance. The result is presented in Table 3.

Table 3: Summary of independent t-test analysis of frequency of use of mobile phones on students' academic performance (N=100).

Variables	\bar{X}	SD	t-value
High frequency users	20.18	2.07	4.78
Low frequency users	16.06	1.97	

Significant at .05 level, df = 98, critical t= 1.96

The result of the analysis in Table 3 shows that the calculated value of 4.78 is greater than the critical t-value of 1.96 at .05 level of significance and 98 degree of freedom. The result further shows that the mean score of students exposed to the frequent use of mobile phones (20.18) was greater than those of low frequent users (16.06). This result is in tandem with the position of Serno and Karmel (2011) that young peoples' networks improved their perception in education and training. Heiphetz (2011) asserts that the frequent use of mobile phones enhance students' learning and work force training.

4. CONCLUSION

The use of assorted configurations of mobile phones for different purposes, including education, is what is in vogue. Impliedly, it is one of the innovative curriculum emphasized by the Nigerian National Policy on Education. It is, however, argued that mobile phones expose students to tons of information and images that literary tear them apart. Despite the fact that the technology is seen as eroding students mental focus and concentration ability, the numerous studies, including this work, have shown that the use of mobile phones as information and global resource for learning has radically altered the stereotypical image of the classroom making it less boring and the learning, more of fun experience. Its proper use has continued to induce positive learning outcome. From the present study, it is also gleaned that high frequency users of mobile phones outperformed the low frequency users.

However, since mobile phones are popular among students and they move with them even into the classroom, it is only logical to expose them to the benefits derivable from the technology and to encourage them to use the device constructively as a catalyst for effective and efficient learning. It would be the height of hypocrisy to exclude from schools or deprive students from using mobile phones that have become a normal part of everyday life, in and out of school in this information age.

5. RECOMMENDATIONS

Based on the importance of mobile phones to students, the following recommendations are made:

1. Regular workshop and counseling services on the effective use of mobile phones for academic purposes should be mounted for all categories of students to enable them maximize the full benefits derivable from this technology.
2. Teachers should cultivate habit of giving assignments that would involve the use of GSM to promote interactive, participative and discovery learning amongst students.
3. Tariffs on GSM and air time should be bought low to enable students afford the learning technology.

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