Analysis of Mobile Phone Impact on Student Academic Performance in Tertiary Institution

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Abstract— The usage of Internet enabled mobile phones is a 21st century experience which covers various operations. This research work examines phone usage and identified the effects internet enabled mobile phones have on the academic performance of students at the tertiary institutions using the Federal Polytechnic students of Ilaro, Ogun State in Nigeria as a case study. The research work was performed so as to understand and also find the correlation between academic performance of students and the usage of mobile phone during class hours which is general believed to be an avenue of distractions to students. The information from this work was carried out using structured questionnaires administered to 45 students to get their individual views. In addition 15 extensive interviews were done concurrently to have a grounded knowledge of the students with the data gathered during the course of this study. Our findings indicated that students are influenced negatively to a great extent by the mobile phone because attention is focused on chatting, music and others while their academic activities are neglected and left to suffer. Also, this study discovered that the use of mobile phone is uncontrollable among students which are the leading cause of poor academic performance among students.

Keywords—Internet enabled Mobile Phones, Usage, Effect, Academic Performance, and Tertiary Institutions.

I. BACKGROUND OF STUDY

Mobile phones have become an almost essential part of daily life since their rapid growth in popularity in the late 1990s. A nationwide survey conducted in 2010 shows that mobile phones are the most necessary medium of communication for adolescents. It has virtually affected the society's accessibility, security, safety and coordination of business and social activities and has hence become a part of culture of the whole world.

The traditional agents of socialisation are families and schools. With the expansion of educational system as a result of the need for highly skilled workers lead to the school system taking increasing larger responsibilities in socialisation [1]. Surprisingly, research on the influence of mobile phone on our school today has not been given much attention.

There is the conflicting priority of young people, parents and teachers in relation to the mobile phone device, with teachers more concerned about issues such as discipline in the classroom and parents worried about means of contacting their children at every point in time [2].

According to majority of research done so far, it was discovered that the use of mobile phone in schools is problematic. As Ling and Helmersen states, the mobile phone is "at cross purpose with the mission of the school". While in school students are supposed take on their prescribed roles as student with full concentration on their studies and free from contact with the outside world. However, the mobile phone gives room to blending students' roles with other roles thus distracting and disrupting the students' academic work. In the past when fixed telephones were the norm in schools, there were minimum distractions and disruptions but presently with the invasion of mobile phone and the eagerness of parents to maintain contact with their wards, the device is becoming part of the classroom. Thus, the mobile phone has the power to undermine the schools' authority and weaken their control over students as well as affects their level of academic performances [3].

II. LITERATURE REVIEW

A. Mobile Phone

The mobile phone was originally made for adults for business use [4]. This is extremely similar to the fixed telephone in the early 20th century, where telephone engineers explained that the telephone was made for the business world and not for social conversation [5]. The growth of mobile phone technology is demonstrated by the fact that in 2002 the number of mobile phone users worldwide, surpassed those of fixed-phone users [2]. It has been predicted that by the end of 2005, the number of mobile phone subscribers worldwide will reach 2 billion (Deloitte Research, 2005) and in Australia will reach 19.2 million [6].

According to Rich Ling [7], the mobile phone has fundamentally affected our society, accessibility, safety, and security, co-ordination of social and business activities. It has become the part of culture of every region in the world. The craze of mobile phone started after 1980's, but it has now touched the level of esteem. First, it was just for a status symbol but now it has become a dire need of the day and is in the reach of everyone.

B. Mobile Phone and its Emergence in Nigeria

Mobile space handsets were not designed with the consumers' usage in mind at the beginning. As at that time it was quite expensive to own handset as individual and the performance of the device was not all that impressive. Back then, mobile phones were designed for the rich and businessmen and not for average people. This was so up to the 1990s even with Nokia and NEC entering the fray. Nokia's first handheld mobile phone, the Mobira Cityman 900, launched in 1989 and weighed just 800g which was a huge improvement over 1982's 9.8kg Mobira Senator model [8].

When mobile phones were launched in the year 2001, Nigerians were liberated from the bondage and epileptic national telecoms monopoly NITEL. Nigerians jubilated and were highly relieved when Econet (now Airtel) and MTN Nigeria launched their mobile Phones and mobile services in 2001. Mobile Phones have not only contributed immeasurably and positively in enhancing economic activities of the nation but have also improved the quality of living of an average Nigerian. Citizens now benefit from services such point on sale payment electronic payment (POS), internet banking, mobile banking, mobile TV, inexpensive internet services, mobile tracking services and affordable international call.

One of the added advantages of mobile phones is that it has made internet more accessible and affordable than ever before, thus giving people a voice on the internet. Lots of Nigerians now access the internet through their mobile Phones or mobile Phones enabled device.

Nigerians have also joined the rest of the world on Facebook, Twitter, Yahoo, Gmail, and Google with quite a huge number of them visiting the sites daily all thanks to mobile Phones. Nigerians are so active in these sites that some of them are considering their sites for Nigeria, all which would not have been possible without affordable internet services offered by mobile Phones operators. The mobile Phones have empowered thousands of Nigerians through the internet to make money. A large number of Nigerians make honest living on the internet as web publishers, bloggers, apps developers, internet security consultants, social media consultants, and online marketing consultants.

Having more people accessing the internet now creates the possibilities of businesses going online, hence creating more opportunities for web developers, application developers, graphics designers, and consultants. Shops are not left out in utilizing the opportunity offered by the internet.

C. Uses of Mobile Phone

The usefulness of cell phones are numerous and this includes keeping contact with friends, members of the family, conducting business and others. Many people possess more than one mobile phone for different purposes, which could be for business purpose or personal purpose. A number of people are also taking the advantage of multiple SIM cards for benefit of different calling plans since a calling plan might provide cheaper local calls, long-distance calls, international calls, or roaming. The following are other benefits;

Distributing content: Mobile phone is also used in this regard. In 1998, an example of distributing and selling media content through the mobile phone was the sale of ringtones by Radiolinja in Finland. Later, other media content emerged which includes news, video games, jokes, horoscopes, TV content and advertising. In 2006, the total value of mobile-phone-paid media content exceeded Internet-paid media content and was worth 31 billion dollars. The value of music on phones was worth 9.3 billion dollars in 2007 and gaming was worth over 5 billion dollars in 2007.

Mobile banking and payment: the advantage of mobile phones is taken in many countries to provide mobile banking services, such as ability to transfer cash payments through safe SMS text message. This service also allows customers to hold cash balances recorded on the SIM cards, deposits or withdraws cash. Some countries also use mobile phone banking for loan disbursement and repayment [10]. A couple of cell phone can operate mobile payments through direct mobile billing schemes [11]. This requires the co-operation of manufacturers, network operators and retail merchants to enable contactless payments [12].

Tracking and privacy: cell phones are also often used to gather location data. As long as the phone is switched on, the geographical location of a mobile phone can be determined easily, with the help of a technique known as multilateration to calculate the differences in time for a signal to move from the cell phone to each of several cell towers near the owner of the phone [13]. The movements of a mobile phone user can be tracked by their service provider and, if desired, by law enforcement agencies and their government. Both the SIM card and the handset can be tracked [14].

China has proposed using this technology to track commuting patterns of Beijing city residents. In the UK and US, law enforcement and intelligence services use mobiles to perform surveillance. They possess technology to activate the microphones in cell phones remotely in order to listen to conversations that take place near the phone [15].

D. Impact of Mobile Phone on Education

The aim of this research is to assess the impact of mobile phones in learning as they enhance students' learning in different ways. Mobile phones easily promote collaborative and different types of learning through their wireless connection to the internet. Their adoption in learning processes by the higher institution management as student-learning and communication device tools is useful. In the classroom mobile phones motivate students to be more engaged to the lesson promoting learner-centered participation. This indicates the dynamic support that the mobile phone has brought to students' learning practice. According to Barker, Krull, and Mallinson [16], the impacts of mobile phone technologies on learning are portability, collaboration and motivation enhancing students, parents and teachers' education system. The mobile phone portability enables student learning to be ubiquitous in obtaining or retrieving course information through their mobile phones as they are carried from class to class or wherever. Their portability can improve a wide variety of learning settings, namely a field trip, the classroom, or outside the campus [16]. Collaboration Social networks such as Facebook and Twitter accessed on students' mobile phones allow students to form groups to distribute and add together their knowledge, and share information with ease, and this could result in a more successful collaborative learning.

The use of mobile phones results in increasing parents' involvement in education, and thus their children's learning and capabilities [16]. Motivation where mobile phones are incorporated in a large classroom, students appear to be more engaged in learning processes. Mobile phones in education increase students' will to learn. They take the initiative in using the device as a learning tool. Teachers report that the use of mobile phones in learning increases group participation in activities done during learning in class [16].

E. Mobile phone Technologies available for Mobile learning

According to Eteokleous and Ktoridou [17], the benefits of mobile phones integration into student learning on campus are useful with the mobile phone capabilities that are easily supporting learning.

Which are: SMSs (text messaging): Short Message Services allow users to send/receive messages of up to 160 characters between mobile phones. MMSs: Multimedia Messaging Service serves the same purpose as SMSs, but it allows the inclusion of graphics. GPRS (General Packet Radio Service): This mobile data service is available to users of specific phone types; it can be used for WAP service, SMS, MMS, email, and access to the World-Wide Web. Wireless access points WAPs: There are two types of wireless standards: *Wireless Fidelity*: (Wi-Fi) and WAP (Wireless Application Protocol). They are primarily for internet access on mobile phones.

Bluetooth: A short-range wireless communication between PCs, PDAs, mobile phones, camera phones, printers and digital cameras, and lots more. Bluetooth uses Radio Frequency (RF) for communication between multiple devices within a 30-foot range. It uses a globally available frequency band (2.4GHz) for worldwide compatibility. 3G and 4G phones: 3G technologies enable network operators to offer users services: wireless voice telephony, video calls, broadband wireless data with data transmission capabilities enabling speeds up to 14.4 Mbit/s on the download and 5.8 Mbit/s on the upload. The 4G mobile phones provide up to 100 megabits per second transmission adequate for multimedia operations [16].

F. Possibilities in Mobile Learning

It is known that mobile technologies have changed life preparedness; today using a GPS (Global Positioning System) means you will never get lost again. The mobile phone technology connectedness is continuing to swing across different landscapes. Soon the importance of deploying mobile technologies in both learning and teaching will be obvious and unavoidable. A few decades ago graphic calculators were a revolutionary addition in the classroom environment, but are now often used for statistics and business classes. Using portable devices in educational cycles is not a new practice.

This paradigm will come up with new practices, tools, applications, resources and designing strategies to understand the situations of ubiquitous, pervasive, personal and connected learning. This connection could be in a formal education experience, or an informal education experience for situated learning. There is no disconnection when using mobile technologies. Mobile technology devices allow the user to have relationships with information in their own ways; learners are uniquely served by mobile learning. This makes the learning experience more memorable relating new information to the old information already known.

There is a great possibility that mobile learning will have a direct positive effect on learning, as technology helps to strengthen students' motivations, focuses attention, and validates the relevance of learning to performance [18].

III. METHODOLOGY

The study subjects are students from the Federal Polytechnic, Ilaro. Quantitative research method was used to properly analyze and give a clear picture of the study. The population for the study comprised 40% students of the institution during the 2012/2013 academic session. This was used as sample for the study. The data obtained for the survey was collected between October and November 2013. It was collected by issuing out questionnaire to the respondents. Close-ended questions were adopted which provided answers that are easy for interpretation and tabulation. A total of 45 copies of questionnaire were distributed to students of the institution including those from the department of Computer Science and a total of 40 were returned giving a response rate of 88.9%. The returned copies of questionnaire were analyzed using percentage and frequency count.

The study adopted the survey research design. We considered this method appropriate as it is useful for the study of non-observable events such as opinions, attitudes preferences or dispositions [19]. Specifically, the study was a correlation, non-contrived and cross-sectional survey having individuals (students of the Federal Polytechnic, Ilaro) as unit of analysis.

The design was such as to discover vital predictive relationship and degrees of association among variables. In order to analyze the information collected, the sampling method of research design was adopted. In this work, the simple random sampling method is adopted. Simple Random Sampling (SRS) is a simple random sample of a given size; all such subsets of the frame are given an equal probability. Furthermore, any given pair of elements has the same chance of selection as any other such pair. This minimizes bias and simplifies analysis of results. In particular, the variance between individual results within the sample is a good indicator of variance in the overall population, which makes it relatively easy to estimate the accuracy of results.

The study population consisted of all students of the Federal Polytechnic, Ilaro, Ogun State.

Thus students were randomly selected on campus to administer the questionnaire. It is expected therefore that the findings of the study will have equal applicability to other students in the schools. The survey questionnaire was accordingly, administered physically and taken back immediately and some after few days.

This is dependent on the choice of the individual making up the sample size. A self-administered process whereby the respondent himself reads the questions and records answer without the assistance of an interviewer. The questionnaire was designed to collect relevant information the questions were numbered for easy references and arranged so that the respondents can understand easily the reason and important attached each question.

The form of questionnaire used provided on easy quick way of collecting objective information from primary sources without necessary allowing the respondents to strain his or her brain for answers. This paper made use of the content validity to determine the validity of the work. Also we made use of test-retest method, in order to test for reliability, out of forty questionnaire returned, 15 questions were marked for test-retest.

IV. RESULT AND DISCUSSION

Statistical Package for Social Sciences (SPSS) was used to test the result of the questionnaire as given by the respondent and the tables and results below are originally generated by us in this paper. 45 Questionnaire were administered to students. Only 40 of the questionnaire were retuned. Table1 shows the relationship between mobile phone usage and Performance of Student. Correlation coefficient was used to determine the relationship between mobile phone usage and Student Grade point. Pearson's correlation is used to determine how the grade point of a student is dependent on their use of the mobile phones.

Table 1
The Relationship Between Mobile Phone Usage And Performance Of Student

	Phone Usage	Current CGPA
Phone Usage **Pearson correlation**	1	.0456**
		.003
Significant(2-tailed test)	40	40
Sample Size (N)		
Current CGPA **Pearson correlation**	.456**	1
	.003	
Significant(2-tailed test)	40	40
Sample Size (N)		

** Correlation is significant at the 0.01 level (2-tailed)

Correlation figure varies between -1 and +1.The larger the values, the stronger the correlation. The variable has a correlation of 1 within them and .456 with one another, which is a significant correlation at only 5%.It is therefore significant to note that poor academic performance of students is dependent on indiscriminate use of mobile phone.

A. Relationship between Social Network Usage and Performance of Student

Correlation coefficient relationship between social network addiction and Student Grade point is determined. Pearson's correlation is used to determine how the grade point of a student is dependent on their use of the social network.

Table 2
Relationship Between Social Network Usage And Performance Of Student

	Social Network Addition	Student Grade Point
Social Network Usage Pearson correlation	1	.523**
		.001
Significant(2-tailed test)	40	40
Sample Size (N)		
Current CGPA Pearson correlation	.523**	1
	.001	
Significant(2-tailed test)	40	40
Sample Size (N)		

**Correlation is significant at the 0.01 level (2-tailed).

Correlation figure varies between -1 and +1.The larger the values, the stronger the correlation. The variable has a correlation of 1 within them and .523 with one another, which is a significant correlation at both 1% and 5%. It is therefore significant to note that poor academic performance of students is dependent on indiscriminate use of social networks.

C. Test of Hypothesis I

1) *Research hypothesis:* Is there significant relationship between students CGPA and how students of the Federal Polytechnic Ilaro use mobile phone in lecture rooms during lecture hours?

2) *Statistical hypothesis*: Question (6) of part v: To test this research working hypothesis, the following statistical hypothesis is derived at.

H0: No significant relationship between student CGPA and how students of the federal polytechnic Ilaro use mobile phone in lecture rooms during lecture hours.

H1: there is significant relationship between student CGPA and how students of the federal polytechnic Ilaro use mobile phone in lecture rooms during lecture hours.

Table 3
Computation Of Test Statistical

Responses	O	E	O – E	(O – E)^2	(O – E)^2/E
YES	28	13.33	14.67	215.21	16.145
NO	9	13.33	-4.33	18.75	1.407
NO IDEA	3	13.33	-10.33	106.71	8.005
TOTAL	40	40	0.01		25.557

Where **E** stands for expected value and **O** is the observed value

$E = 40/3 = 13.33$
$X^2 = \sum \frac{\sum(O - E)^2}{E} = 25.55$ (H1)
X^2 table value $= (r - 1) = (3 - 1) = 2$
2 at 0.05 = 5.991 (H0)

Conclusion: since the X^2 calculated value of 25.55 is greater than the X^2 table value of 5.991. Hence, we reject H0 and accept H1 and conclude that there is significant relationship between the uses of mobile phone in the lecture room.

D. Test of Hypothesis II

1) *Research hypothesis*: Is there significant relationship between the usage of phones for academic purposes and other activities?

2) *Statistical hypothesis*: Question (8) of part v: To test this research working hypothesis, the following statistical hypothesis is derived at.

H0: No significantrelationship between the usage of phones for academic purposes and other activities.

H1: there is significantrelationship between the usage of phones for academic purposes and other activities.

Table 4
Computation Of Test Statistical For Academic Purpose Compared To Other Activities

	Observed N	Expected N	Residual
Yes	11	13.3	-2.3
No	26	13.3	12.7
No Idea	3	13.3	-10.3
Total	40		

Table 5
Test Statistics

	Is the Percentage of the usage of the Phone for Academic purpose higher compared to other Activities?
Chi-Square **df** **Asymp. Sig.**	20.450[a] 2 .000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected frequency is 13.3.

X^2 table value = (r −1) = (3 − 1) = 2
 2 at 0.05 = 5.991 (H0)

Conclusion: since the X^2 calculated value of 20.450 is greater than the X^2 table value of 5.991. Hence, we reject H0 and accept H1. There is significant relationship between the usage of the mobile for other activities like chatting on Facebook, Whatsapp and BBM compare to academic purpose.

Discussion of Findings

From the analysis of result in table above, the following findings were made during the research;

- 45 questionnaires were administered; 40 were collected while 5 were not collected.
- Most of the respondent blamed their poor academic performance on the indiscriminate usage of mobile phones.
- Most of the respondent believed that the biggest issue in mobile phone usage is the addiction to usage of social network.
- Most of the respondent believed that the students use their mobile phones on social network more than using it to learn eBooks.

Some also believed that if the use of mobile phone is managed and properly harnessed, it would definitely improve the academic performance of students.

V. CONCLUSION

Mobile phone is one the technology of our time. It has its positive effect as well as negative impact on own society. This study has demonstrated that the students of Federal Polytechnic Ilaro are aware of the social networking sites and had access to them. Findings also indicated that they are influenced to a great extent by the social media negatively because attention is focused on chatting, music and others while their academic activities are neglected and left to suffer. Also, this study discovered that the use of mobile phone is uncontrollable among students which are the leading cause of poor academic performance among students.

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