
Use of Mobile Devices by Undergraduates of Physics and Physics-Related Courses in University of Port Harcourt, Rivers State

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Abstract

This study investigated the use of mobile devices by undergraduates who offer physics and physics-related courses in the University of Port Harcourt. The design for this study was descriptive survey design. Three research questions guided the study. Purposive random sampling technique was used to select one hundred and twenty (120) undergraduates from the faculties whose students offer physics and physics-related courses. The research instrument was a validated questionnaire titled 'Mobile Devices in Physics Learning Questionnaire' (MDPLQ) with a reliability coefficient of 0.75 obtained using Cronbach alpha formula. Mean, percentage and ranking were used to analyze the data generated for the study. Findings revealed that the mostly used mobile devices by the undergraduates are Smart Phones, Ipads, and Tablet Phones. The study further reveals that the undergraduates use mobile devices for communication, business transactions, entertainment, academic purpose, location of places, accessing mails, reading online newspapers, chatting and streaming of online events. They however do not use mobile devices for flight booking. Concerning academic activities, the undergraduates use mobile devices to download physics textbooks, download physics-related videos, obtain animations, download materials for academic research, obtain graphics, download simulations for learning physics and for video conferencing. It is therefore recommended that lecturers should engage undergraduates in physics learning activities and experiences as well as assignments with the use of mobile devices. Undergraduates should also be encouraged to meaningfully use more of the time they spend on their mobile devices to learn physics more than other activities.

Keywords: Mobile Devices, Mobile Learning, Physics, Physics-related Courses.

INTRODUCTION

Mobile devices are portable, handheld and wireless technologies such as cell phones, smart phones, laptops, ipads, notebooks, ipods, mp3, pen drives and personal digital assistants (PDAs). Mobile devices offer unique affordances of portability, social interactivity, context sensitivity, connectivity and individuality (Klopfer, Squire & Jenkins, 2002). Mobile devices have gained so much popularity among youths and adults that some people cannot do without its services in a day. Crabtree, Nathan and Roberts (2003) discovered that 90% of the youth and 75% of the general population own mobile phones in United Kingdom. Similarly, Jacob

and Issac (2008) discovered that 88% of the students involved in their study possess pen drives, 78% of the students possess cell phones, 74% of the students possess laptops, 46% of the students possess mp3, 24% of the students possess ipods, 20% of the students possess smart phones while 14% of the students possess PDA. In the same vein, Abuhassna and Amin (2014) found that 17% of the students involved in their study use mobile technologies every day, 20% of the students use mobile technologies frequently, 17% of students use mobile technologies often, 9% of the students use mobile technologies occasionally (so 63% of the students use mobile technologies) while 36% of them never used mobile technologies.

In many endeavors of life, mobile devices enable broad range of uses and situated activities. These devices have become interface through which people learn, entertain, book flights, shop, bank, research and communicate with one another (Nyiri, 2002). Jacob and Issac (2008) discovered that students use mobile devices to send and receive emails, instant messages, short text messages and multimedia messages. The students also use mobile devices to transfer files from one place to another, play interactive games and transfer photo / audio or other data. Similarly, Obafemi and Fomsi (2017) found that lecturers of physics and physics-related courses use mobile devices for different purposes such as communication, business transactions, entertainment, accessing resources for research and teaching of physics, download physics textbooks, download physics teaching and learning videos, obtain animations, download materials for academic research, obtain graphics, and download simulations for teaching of physics and for video conferencing. The lecturers however do not use mobile devices to administer physics assignments.

In this technology-driven age, learning is no more confined to the four walls of the classroom thus the emergence of mobile learning. Mobile devices enable mobile learning as well as individualized learning experiences, making learners responsible for what they learn. Mobile devices enable mobility of the learner and learning on the go. They can learn anywhere and anytime, using their mobile devices. Robinson and Stubberud (2012) found that for the delivery of educational material, students preferred customized notes which are posted online and use of multimedia materials to textbook. Similarly, Aviles and Eastman (2012) found that students' choice of technology of learning is the Smart phone.

Considering the importance of the knowledge of Physics in nation building, the teaching and learning of the subject which hovers around talking and copying of lecture notes and strictly confined to the four walls of the classroom can no more suffice to achieve the objectives of teaching the subject in Nigerian schools. Mobile devices can provide the variety of learning experiences desired by physics learners. It is therefore high time lecturers stepped up their game by integrating mobile devices in the teaching and learning of physics and physics-related courses. McGee and Diaz (2007) noted that social media (accessed through mobile devices) provides opportunity for communication with students, sharing of learning materials with students and encourage interaction among them.

As versatile and convenient as mobile devices are, much concerns have been raised about the disadvantages of the use of mobile devices in learning such as the distracting nature of these devices to students. This is because undergraduates who are mostly youths spent so much of their time browsing, chatting and doing all sorts of things through mobile devices at the detriment of their academics. Some students who participated in the study by Jacob and Issac (2008) commented that mobile learning through mobile devices may cause distraction to students, gives some students opportunity to miss lessons, may not be sufficient for learning and may not be affordable to many students.

The youths of today are excited about emerging technologies such as mobile devices and as such spend much time on them. Meanwhile, enrolment in physics has persistently been low while majority of students who offer physics do so because physics is a requirement for the professions or discipline they are studying making many of them struggle to obtain good

grades in the subject. In what ways do undergraduates use mobile devices? Could mobile devices be employed in learning physics? This study therefore is aimed at investigating the use of mobile devices by undergraduates of physics and physics-related courses in the University of Port Harcourt.

Purpose of the Study

The purpose of this study is to investigate the use of mobile devices by undergraduates of physics and physics-related courses in the University of Port Harcourt. Specifically, the objectives of the study are to:

- Identify the types of mobile devices being used by undergraduates of physics and physics-related courses.
- Investigate the ways in which undergraduates of physics and physics-related courses use mobile devices.
- Ascertain the academic activities for which undergraduates of physics and physics-related courses use mobile devices.

Research Questions

- What types of mobile devices are being used by undergraduates of physics and physics-related courses?
- In what ways do undergraduates of physics and physics-related courses use mobile devices?
- What are the academic activities for which undergraduates of physics and physics-related courses use mobile devices?

METHODOLOGY

In this study which is a descriptive survey study, purposive random sampling was used to select twenty undergraduates from year 3 to year 5 from each of the six faculties whose undergraduates offer Physics and Physics-related courses. This summed up to 120 undergraduates. These faculties are Faculty of Basic Medical Sciences, Pharmaceutical sciences, Engineering, Sciences, Education (Physics Education) and Agriculture. The research instrument was a validated researcher-developed questionnaire titled 'Mobile Devices in Physics Learning Questionnaire' (MDPLQ) with a reliability coefficient of 0.75 obtained using Cronbach alpha formula. The instrument has two sections. Section A was used to gather information on the respondents' bio-data and Section B contained statements addressing the use of mobile devices in the learning of physics and physics-related courses. The responses were based on the modified 4 - point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) scored 4, 3, 2 and 1 respectively. Mean, percentages and ranking were adopted in the analysis of the data. A criterion mean of 2.50 was used to make decisions to accept or reject the statements.

RESULTS

Research Question One: What types of mobile devices are being used by undergraduates of physics and physics-related courses?

Table 1: Types of mobile devices used by undergraduates of physics and physics-related courses

S/N	Devices	Frequency	Total Respondents	Rank
1	Tablet Phones	40 (33.33%)	120	3 rd
2	Smart Phones	50 (41.66%)	120	1 st
3	Ipads	45 (37.50%)	120	2 nd
4	Digital Video Cameras	14 (11.66%)	120	5 th
5	Mobile Phones	39 (32.50%)	120	4 th
6	Digital still cameras.	5 (4.16%)	120	7 th
7	Smart Cards	14 (11.66%)	120	5 th

Table 1 shows that the mostly used mobile devices by the undergraduates are Smart Phones, Ipads, and Tablet Phones and Mobile phones with the percentages of 41.66%, 37.50%, 33.33% and 32.50% respectively while other mobile devices were minimally used by the undergraduates.

Research Question Two: In what ways do undergraduates of physics and physics-related courses use mobile devices?

Table 2: Use of mobile devices by undergraduates of physics and physics-related courses

S/N	ITEMS	SA	A	D	SD	Total score	Total Respondents	Mean	Decision
1	Communication	107 (89.16)	3 (2.50)	1 (0.83)	9 (7.50)	448	120	3.73	Accepted
2	Business transactions	86 (71.60)	19 (15.53)	6 (5.00)	9 (7.50)	422	120	3.52	Accepted
3	Entertainment	110 (91.66)	9 (7.50)	0 (0.00)	1 (0.83)	468	120	3.90	Accepted
4	Academic purpose	109 (90.83)	3 (2.50)	0 (0.00)	8 (6.66)	453	120	3.77	Accepted
5	Flight booking	26 (21.66)	25 (20.23)	38 (31.66)	31 (25.83)	286	120	2.38	Rejected
6	Location of places	61 (50.83)	40 (33.33)	11 (9.16)	8 (6.66)	394	120	3.28	Accepted
7	Access mail	95 (79.16)	15 (12.50)	0 (0.00)	10 (8.33)	435	120	3.63	Accepted
8	Reading online newspapers	92 (76.66)	9 (7.50)	9 (7.50)	10 (8.33)	423	120	3.53	Accepted
9	Chatting	108 (90.00)	8 (6.66)	4 (3.33)	0 (0.00)	464	120	3.86	Accepted
10	Streaming of online events	53 (44.16)	36 (30.00)	19 (15.83)	12 (10.00)	370	120	3.08	Accepted

Table 2 reveals that 91.66% of the undergraduates use mobile devices for communication, 87.13% of the undergraduates use mobile devices for business transactions, 99.16% of the undergraduates use mobile devices for entertainment, 93.33% of the undergraduates use mobile devices for academic purpose, 41.89% of the undergraduates use mobile devices for flight booking, 84.16% of the undergraduates use mobile devices for location of places, 91.66% of the undergraduates use mobile devices for to access mails, 84.16% of the undergraduates use mobile devices for read online newspapers, 96.66% of the undergraduates use mobile devices for chatting and 74.16% of the undergraduates use mobile devices for streaming of online events. The mean values of all the items were greater than 2.50 the

criterion mean except item 5. Consequently, all the items except flight booking were accepted by undergraduates as ways in which they use mobile devices.

Research Questions Three: What are the academic activities for which undergraduates of physics and physics-related courses use mobile devices?

Table 3: Mean and percentage scores of academic activities for which undergraduates use mobile devices

S/N	ITEMS	SA	A	D	SD	Total Score	Total Respondents	Mean	Decision
11	Download physics textbooks.	82 (68.33)	13 (10.83)	13 (10.83)	12 (10.00)	405	120	3.37	Accepted
12	Download physics videos.	62 (51.66)	33 (27.50)	13 (10.83)	12 (10.00)	385	120	3.20	Accepted
13	Obtain animations.	59 (49.16)	39 (32.50)	14 (11.66)	8 (6.66)	389	120	3.24	Accepted
14	Download materials for academic research.	98 (81.66)	10 (8.33)	6 (5.00)	6 (5.00)	440	120	3.66	Accepted
15	Obtain graphics.	53 (44.16)	54 (45.00)	9 (7.50)	4 (3.33)	396	120	3.30	Accepted
16	Download simulations for learning physics.	49 (40.83)	40 (33.33)	18 (15.00)	13 (10.83)	365	120	3.04	Accepted
17	Video conferencing	57 (47.50)	38 (31.66)	12 (10.00)	13 (10.83)	379	120	3.15	Accepted

Table 3 reveals that 79.16% of the undergraduates use mobile devices to download physics textbooks, 79.16% of the undergraduates use mobile devices to download physics videos, 81.66% of the undergraduates use mobile devices to obtain animations, 89.99% of the undergraduates use mobile devices to download materials for academic research, 89.16% of the undergraduates use mobile devices to obtain graphics, 74.16% of the undergraduates use mobile devices to download simulations for learning physics while 79.16% of the undergraduates use mobile devices for video conferencing. The mean values of the items were greater than 2.50 the criterion mean. Consequently, all the items were accepted by undergraduates as academic activities for which they use mobile devices.

DISCUSSION OF FINDINGS

Table 1 reveals that the mostly used mobile devices by the undergraduates are Smart Phones, Ipads, and Tablet Phones and Mobile phones. This may be due to the portable nature of the devices and the fact that they allow for individuality. This finding agrees with Crabtree, Nathan and Roberts (2003) who discovered that 90% of youths own mobile phones in United Kingdom. It is also in line with the findings of Jacob and Issac (2008) that 88% of the students involved in their study possess pen drives, 78% of the students possess cell phones, 74% of the students possess laptops, 46% of the students possess mp3, 24% of the students possess ipods, 20% of the students possess smart phones while 14% of the students possess PDA.

Table 2 reveals that the undergraduates use mobile devices for communication, business transactions, entertainment, academic purpose, location of places, accessing mails, reading online newspapers, chatting and streaming of online events. They however do not use mobile devices for flight booking. This finding may also be due to the fact that mobile devices allow for social interactivity, context sensitivity, connectivity and individuality. This finding agrees with the view of Nyiri (2002) that mobile devices have become an interface through which people learn, entertain, book flights, shop, bank, research and communicate with one another. The finding is also in line with the findings of Jacob and Issac (2008) that students use mobile devices to send and receive emails, instant messages, short text messages and multimedia messages. The students also use mobile devices to transfer files from one place to another, play interactive games and transfer photo / audio or other data. It is also in consonance with that of Obafemi and Fomsi (2017) that lecturers use mobile devices for different purposes such as communication, business transactions, entertainment, academic purposes.

Table 3 reveals that academic activities for which the undergraduates use mobile devices are to download physics textbooks, download physics videos, obtain animations, download materials for academic research, obtain graphics, download simulations for learning physics and for video conferencing. This may be due to the fact that the undergraduates are digital natives who find it very easy to manipulate emerging technologies such as mobile devices. This finding agrees with that of Obafemi and Fomsi (2017) that lecturers use mobile devices for academic purposes such as accessing resources for research and teaching of physics, download physics textbooks, download physics teaching and learning videos, obtain animations, download materials for academic research, obtain graphics, and download simulations for teaching of physics and for video conferencing. The lecturers however do not use mobile devices to administer physics assignments. The finding also conforms with McGee and Diaz (2007)'s submission that social media (accessed through mobile devices) provides opportunity for communication with students, sharing of learning materials with students and encourage interaction among them.

Implication of findings

This study has shown that undergraduates of physics and physics-related courses use mobile devices for many purposes including the learning of physics. If this flair of the undergraduates for technology can be maximally harnessed in imparting physics knowledge and skills to them, the persistent issues of low enrolment and poor performance of students in physics will be overcome.

CONCLUSION

The undergraduates who are mostly youths are digital natives who spend much time on emerging technologies such as mobile phones for one purpose or the other. Also, the world has become a global village in which Nigerian undergraduates have found themselves to be competing with their counterparts in other countries of the world. It is therefore expedient that their flair for technology be harnessed in imparting physics knowledge to the youths. This can be achieved by engaging them in physics learning activities and experiences with the use of mobile devices. This will enhance their acquisition of physics knowledge and skills so much that they will not lag behind their counterparts in other countries of the world.

Recommendations

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

- Lecturers should engage undergraduates in physics learning activities and experiences as well as assignments with the use of mobile devices.
- Undergraduates should be encouraged to meaningfully use their mobile devices to learn physics more than other activities.
- Undergraduates should be encouraged to use more of the time they spend on their mobile devices to learn physics.

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