



# **Awareness and Use of Mobile Devices for the Teaching and Learning of Physics, Amongst Undergraduate Students at the University of Port Harcourt, Nigeria**

Avwiri, Eseroghene<sup>1</sup> & Ewurufe Ufuoma Grace<sup>2</sup>

**Department of Curriculum Studies and Educational Technology  
Faculty of Education, University of Port Harcourt  
Port Harcourt, Rivers State, Nigeria  
08063783135: 08062523782  
eseroghene.avwiri@uniport.edu.ng**

## **ABSTRACT**

The purpose of this study was to check the awareness and use of mobile devices in the teaching and learning of physics among undergraduate's students of the University of Port Harcourt Rivers State, Nigeria. The study is a descriptive survey design. A sample of 140 final year undergraduate physics students was used for the study. The instrument used for the study was a validated questionnaire. The reliability of the instrument was tested using cronbach alpha method and a reliability coefficient index of 0.85 was obtained. Mean and percentage were used to answer the three research questions for the study. The findings revealed that Undergraduate students use different types of phones, and also use mobile devices as social media for activities such as online charting, learning, submitting assignments to gather relevant school material, get useful information anytime and anywhere for academic purposes. It was therefore recommended that every student should own an android phone to source for information. Phone manufacturers should produce more portable mobile devices. If possible, the school authority should provide free and uninterrupted data for students to access the internet.

**Keywords:** Mobile device, awareness and use

## **INTRODUCTION**

The need to eradicate illiteracy from the society can be achieve through the school, and that is while education is necessary in order to impart knowledge from the teachers to the students. The teaching and learning has been a face to face type. However, with the advent of Information and Communication Technology (ICT), education can now go beyond face to face to online teaching and learning through the use of mobile devices such as smart phones, lap top, and tablets.(Jee,2010). Mobile devices are handheld portable computing devices which uses wireless fidelity (WiFi) with which the internet can be accessed. Technology in 1940's were not mobile, not until Martin Cooper invented portable phones with Motorola. (West,2013). Park (2011), stated that the use of mobile devices for the purpose of gaining education has led to mobile learning. Wright,2017 noted that so many smart phones and other mobile devices has been introduced as a result of this digital development era. The choice of the type of mobile device used by students could be due to user specific needs such as high computational abilities, weight and size of phones, battery that can power the mobile device for longer hours. As emphasized by Rothaernal, (2016 ), that the manufacturers of mobile devices have become innovative to impute new features into the phones to gain an edge over their competitors. This devices, could enable the students easily get information and help to improve learning activity anywhere in the globe as emphasized by UNESCO 2002, that Information and communication Technology strengthens education in the 21<sup>st</sup> century.

The National Policy on Education (FRN,2004), stated some objectives of tertiary education which should be reflected in the society.

1. Individual intelligent capacity should be developed, for them to appreciate their environment.
2. The acquisition of an objective view of the local and external environment.
3. Encouraging citizens to acquire skills that will make them useful to themselves and the society.

The students need to be very much aware and respond to this digital age developments. As emphasized by Health, Vom Lehn, Hindmarch, Svensson. Sanchez and Luff, (2002), that awareness is being able to respond to the happening in the environment where the need arises, for the students to be able to respond to the use of mobile devices for educational purposes shows integration to the aspect of practical. To acquire all these, the schools must be well equipped with standard classroom, libraries, laboratories and the teachers must be well trained and must be computer literate, more especially as ICT is involved.

Physics as a science subjects has led to the development of technology. It exposes students to all aspect of life such as the study of matter, energy and its interactions. The knowledge of Physics is very useful to the physical sciences, such as chemistry, engineers, computer science, and to other disciplines like agricultural, biological, and environmental sciences, even astrophysics and cosmology – are not left out.

There are new instruments and equipment that have been produced through the knowledge of physics clinical and medical appliances such as ultrasonic imaging and laser surgery. The economy has improved through the agricultural development of modern equipment and in the area of climate change.

The introduction of online learning and teaching is very important in the educational system. Information and Communication Technology (ICT) which refers to technologies that provides access to information through telecommunications. The use of online learning and teaching is very important in the educational system. As emphasized by Wylie, 2015 that students use their mobile devices and most ICT tools to support their academics work.

Williams and Adesope (2017) affirmed that students use social media through their mobile device for educational purposes. This study hinges on the theory of connectivism. Connectivism theory relates how internet technology creates new opportunities which enables people learn and share information across the globe, (Downes and Siemens 2005). The tools needed to share this information to the world wide web are social networks on line forum discussion which are added with mobile devices. It also hinge on engagement based theory propounded by Kearsley and Schneiderman 1999. The theory emphasized creating collaborative learning, interaction with learning materials, activities and communities. It entails the students relating, creating and donating as they form a team work. As with mobile device, communication gets to one another were ideas will be related and sheared amongst learners.

#### Statement of the Problem

The world has indeed become a global village with the aid of the internet it is expected that one can get the needed information for everyday life. This therefore emphasized the proper use of mobile devices by teachers and learners. Most often the students are seen playing games with their phones, chatting with friends, (Ashawani,2014). Are the students aware they could use their phones for academic purpose such as getting study materials from the net and discussing assignments. Most cases, they chat and waste their time instead of doing meaningful academic pursuit. Could it be they are not aware that they could get academic materials from the net? Therefore, this study is out to investigate the awareness and use of mobile devices for the teaching and learning of physics among undergraduate students at the University of Port Harcourt.

#### Aim and Objectives

The aim of this study is to investigate the use of mobile devices in the teaching and learning of physics among undergraduate students at the University of Port Harcourt, Rivers state, Nigeria.

Specifically, the objectives of this study are to:

1. Find out the types of mobile devices used by physics undergraduate students.
2. Investigate the use of mobile devices among undergraduate physics students.
3. Ascertain the level of awareness among university students on the use of mobile devices for the teaching and learning of physics.

**Research Questions**

The following research questions were formulated to guide the study.

1. What are the types of mobile devices used by physics undergraduate students?
2. How do physics undergraduate students use mobile devices?
3. What is the level of awareness among physics students on the use of mobile devices for the teaching and learning of physics?

**METHODOLOGY**

The study is a descriptive survey. Purposive sampling was used to get the sample. Physics undergraduate students from the University of Port Harcourt in Obio Akpor local government area of Rivers State were used for the study, The population of the study comprises of 140 final year undergraduate Physics students which also serve as the sample since they are few. The instrument for the study was a structured questionnaire which is titled, Physics Students Awareness and Use of Mobile Devices for Learning Questionnaire. (PSAUMDLQ). The reliability of the instrument is 0.83 using Cronbach Alpha statistical technique. It was developed by the researcher to investigate the awareness and use of mobile devices for learning of physics among undergraduate. The instrument has two section; section A and section B. section A described the demographic characteristic of respondents and section B intends to gather information from the respondents on the type of phones used, awareness and the use of mobile device for learning of physics among undergraduate. Two research assistants assisted the researcher in administering the questionnaire. The respondents are to respond to the questionnaire items on modified 4 likert scale Strongly Agreed (SA=4), Agreed (A=3), Disagree (D=2) and Strongly Disagree (SD=1). Very High Level (VHL=4), High Level (HL=3), Low Level (LL=2), Very Low Level (VLL=1). The criterion mean is gotten from the weighted mean responses,  $(4+3+2+1) \div 4 = 2.5$  (Criterion mean). The criterion mean and percentage was used in answering the research.

The study focuses on the use of mobile devices in the teaching and learning of physics among undergraduate physics students at the University of Port Harcourt, Rivers state, Nigeria.

**RESULTS**

**Research Question 1:** *What types of mobile devices are being used by undergraduate physics students?*

**Table 1. Responses of students on the types of mobile devices**

S/N	ITEMS	FREQUENCY	PERCENTAGE
1	INFINIX	26	18.46
2	SAMSUNG	21	14.91
3	TECHNO	15	11.4
4	IPHONE	14	9.94
5	HUAWEI	13	9.23
6.	FERO	9	6.39
7	NOKIA	6	4.26
8	SONY	6	4.26
9	HTC	4	2.84
10	LG	4	2.84
11	BLACKBERRY	4	2.84
12	AMAZON	2	1.42

Total number of respondents = 140

Table 1 shows that Infinix (18.46%), Samsung (14.91%) Techno (11.4%) Iphone (9.94%) and Huawei (9.23%) are the commonly used phones by Physics undergraduate students in the University of Port Harcourt.

**Research question 2:** *What are the ways Physics undergraduate students use mobile devices?*

Table 2. Responses on ways in which physics students use mobile devices

Frequencies in percentages

S/ N	STATEMENT	Strongly Agree	Agree	Disagree	Strongly disagree	Total score	Mean	Remarks
1	I use mobile devices during online courses	68 (46.57%)	44 (31.43%)	26 (18.57%)	2 (1.43%)	456	3.24	Accept
2	I use mobile devices to get materials for exams.	50 (35.57%)	40 (28.57%)	30 (21.43%)	20 (14.29%)	400	2.86	Accept
3	I usually download materials online for my study	80 (57.14%)	40 (28.57%)	14 (10.00%)	6 (4.28%)	474	3.39	Accept
4	I do carryout my own research after lectures using mobile device	62 (44.27%)	43 (30.71%)	18 (12.82%)	17 (12.14%)	430	3.07	Accept
5	Mobile devices is very effective when I am taking notes in class.	16 (11.43%)	35 (25.00%)	65 (46.43%)	24 (17.14%)	323	2.30	Reject
6	I use mobile devices to get information for my seminar and project work	82 (58.57%)	40 (28.57%)	14 (10.00%)	4 (2.86%)	480	3.43	Accept

Grand mean = 3.05

Total number of respondents = 140

Table 2 shows that 78.00% of the respondents strongly agree or agree they use their mobile devices to register their courses online.

64.14% of the respondents strongly agree or agree that their mobile devices are used for gathering materials to write examination.

85.71% of the respondents strongly agree or agree that they use their mobile devices to download study materials.

74.98% of the respondents also strongly agree or agree that they use their mobile devices to conduct personal research after classes.

63.57% of the respondents strongly disagree to using their mobile device in taking note in class.

While 87.14% of the respondents strongly agree or agree that they use mobile devices to get information for seminar and project.

**Research question 3:** *What is the level of awareness among physics undergraduates on the use of mobile devices for the teaching and learning of physics?*

Table 3: Responses of undergraduates physics students on the level of awareness on the use of mobile devices for the teaching and learning of physics (Frequency in percentages).

S/N	STATEMENT	Very high level	High level	Low level	Very low level	Total Score	Mean	Remarks
1	I am aware mobile devices can be use to do assignments	82 (58.57%)	41 (29.11%)	13 (9.23%)	4 (2.84%)	480	3.43	High level
2.	Physics students are aware they can participate in group learning using mobile devices.	45 (31.95%)	31 (22.01%)	34 (24.14%)	30 (21.30)	371	2.65	High level
3.	I am aware mobile device can be used to simulate Physics concept.	70 (49.70%)	30 (21.30%)	14 (9.94%)	26 (17.75%)	424	3.03	High level
4.	Students are aware they can use mobile devices to access information and study materials anywhere in the globe.	70 (49.70%)	40 (28.40%)	24 (17.04%)	6 (4.26%)	454	3.24	High level
5.	I am aware mobile device, can be use for research	45 (31.95%)	39 (27.67%)	30 (21.30%)	26 (18.46%)	383	2.74	High level
6.	I am aware my knowledge of physics can increase with the use of mobile device.	39 (27.69%)	45 (31.95%)	30 (21.30%)	26 (18.46%)	383	2.74	High level
7.	I am not aware that I can discuss difficult physics concepts with my lecturers and colleagues using mobile device.	25 (17.75%)	38 (26.98%)	50 (35.50%)	27 (19.17%)	341	2.44	Low level

Grand mean = 2.90

Table 3 shows that 87.68% of the respondents accepted that they have a very high level of awareness for the use of mobile devices in doing assignment.

53.96% of the respondents accepted that the level of awareness by physics students to participate in group learning using mobile device is high.

71% of the respondents accepted the level of awareness on the use of mobile device to stimulate physics concepts is very high.

78.1% of the respondents accepted that the awareness of students on the use of mobile devices to access information and study materials anywhere in the globe is very high.

59.62% of the respondents accepted that the level of awareness of students' use of mobile device for research is very high.

59.64% of the respondents accepted that the awareness level of physics knowledge, been increased with the use of mobile device is very high.

54.67% of the respondents did not accept the awareness that they can discuss difficult physics concepts with their lecturers and colleagues using mobile device.

## DISCUSSIONS OF RESULTS

These phones Infinix, Samsung, Techno, Iphone and Huawei are the commonly used by final year Physics undergraduate students at the University of Port Harcourt. The interest of the students in using these phones could be their portability and fast internet accessibility and can deliver so many functions, this agrees with Rothaermel, 2016 that attractive and innovative features should be put into consideration by manufacturers of mobile devices.

The students use mobile devices for academic activities such as registry during online courses, to get materials for examinations, to download materials online for their studies and, to get information for seminar and project work. The grand mean 3.05 is higher than the criterion mean of 2.5. This agrees with Williams and Adesope (2017) and Wylie, 2015 that students use mobile devices for academic purposes.

The level of awareness among physics undergraduates on the use of mobile devices for the teaching and learning of physics is high. The grand mean 2.90 is higher than the criterion mean of 2.5. This agrees with Health, Vom Lehn, Hindmarch, Svensson, Sanchez and Luff, (2002), that the students are aware of the happenings in the digital era thereby making good use of their mobile devices for academic activities.

## CONCLUSION

The study reveals the awareness and use of mobile devices and the possibility of using it for effective teaching and learning of physics by undergraduate students, in the University of Port Harcourt. It was discovered that most of the students are aware of the technology involved in the phone, and they use it for academic purposes, such as, downloading educational materials for classwork, project and submitting assignment. The different types of phones used by the students was also investigated upon.

## RECOMMENDATIONS

Based on the research findings, it is therefore recommended that:

1. Smart phones commonly used by the students should be made available in the market.
2. Students should make use of the advantages and opportunities provided by mobile devices to search for Physics materials that are useful for the teaching and learning of physics.

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