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By

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Abstract

This study aims at establishing the use of smart phones for information seeking by undergraduate students in a Nigerian Specialised University. A descriptive survey design was adopted**.** Five objectives and five research questions were formulated to guide the study. A stratified random sampling technique was used to select one thousand four hundred and three (1,403) respondents across the two colleges for the study whereas 84% were retrieved. The data collected were analysed using descriptive statistical tools such as frequency, percentage and means. The outcome of the study revealed that apple iOS topped the highest types of smart phone used for information seeking by undergraduate students follow by Google android, blackberry, open WebOS, MeeGo, window phone, Symbian and others. The result also, discovered that factors affecting the use of smart phones for information seeking by undergraduate students include poor battery, high rate of theft on campus, lack of technical experts on repairs when faulty within campus, high cost of data subscription/ Internet access,

phone crashes, fragility, poor usage skills, unstable power supply for regular charging, among others. The paper concluded that undergraduates students at all levels should be encouraged to use smartphones for academic works and regular training should be conducted for undergraduate's students on how to maximize access to information using their smart phones.

Introduction

Since the advent of mobile technology in April 1973 they have been widely adopted by professionals from different fields as it the most pervasive technology that has great impacts on humans. A smartphone is a category of mobile phone that provides the functions of a small computer. Smartphones run complete operating system (OS) software that provides a standardized interface and platform for advanced third-party apps. Popular smartphone OSes include Google's Android and Apple's iOS (Phone Scoop, 2017).

Smartphone's and the applications (Apps) that can be downloaded to Smartphone's are inventions that keep individuals connected to society, especially undergraduate students (Jesse, 2015). According to Smith and Tran (2017), the number of Nigeria's mobile subscribers has reached 150 million, and the number of its internet users has climbed to 97.2 million at penetration rates of 81% and 53%, respectively, according to a new report published by Jumia, Nigeria's largest online retailer. A large percentage of mobile and internet subscribers are undergraduate students who are digital natives. These young stars require information to be informed, get a better understanding of their field of study, get latest news and happenings around, get sports updates and keep communication with friends and family.

Web 2.0 integration in smart phones has made them very interesting to use by undergraduate students as it boosts communication, aid research, enhanced information sharing and enable them to get updated with news and happenings around them. Study materials can be downloaded to a smart phone, saved in folders and used later even without internet connectivity. According to Kowalski (2016), mobile devices make it easy for students to type and organize notes, while calculator apps can help with math problems. Similarly, mobile devices can even replace heavy paper textbooks as e-books, e-journals and electronic databases can be accessed and read with the use of smart phones. The usage of smart phones has a lot of prospects for undergraduate students as they can go online with ease to seek information that meet their needs, communicate with friends and family members, make and receive calls, send

and receive sms, record, watch and upload video, take pictures, play games and enjoy other entertainment features. Inspite of these enormous benefits in the use of smart phones by undergraduate students, a lot of students are addicted to the use of Smartphone's which have hampered their concentration in their academics to a very large extent.

Currently there is no study on the use of Smartphone's for information seeking by undergraduate students in Nigeria. This gap in knowledge prompted the need for this study to ascertain the different uses of smart phones by undergraduate students as well as the challenges facing the use of Smartphone's by undergraduates in Nigeria.

A brief background of federal university of petroleum resources, (FUPRE) Library.

Federal University of Petroleum Resources, (FUPRE), Delta State, Nigeria. First in African sixth in the world was established in March 2007, under a Federal Government of Nigeria initiative. It is aimed at building a specialized University to produce a unique high level manpower and relevant expertise for oil and gas sector in Nigeria and worldwide. The ground work for the commencement of the University Library started with the assumption of duty by a principal librarian, Mr. Mathew I. Okoh on September 6th, 2010. However, the library became operational in October 2011 after the recruitment of staff. At the time of opening to users, the library had in stock the following titles: books- 3000, journal- 85 and a database of over 2000 electronic journal articles in Oil and Gas, General sciences, Engineering, ICT and Earth Science.

Presently the library serves its constituents colleges of science and that of technology. An e-library with functional internet facilities that provides access to varieties of educational materials is in place. FUPRE library is the hub of academic activities of the institution. Students, staff and researchers make use of the library for learning, teaching, research and development. According to FUPRE Library Handbook, the services of the library include:

- Loan Service
- Reference Service
- Inter- Library Loan Service
- E- Library Service
- Current Awareness Service
- Training Service

The library operates shift duties in order to ensure that staff, students, and researchers make maximum use of the materials. Relevant information is downloaded from databases that were subscribed by the library and made available to academic staff and students. The library organizes orientation program and also gives referral letters to students for research activities to other libraries.

Branch libraries

FUPRE Library has two branch libraries, and they are the College of Science Library and College of Technology library:

College of science: The College of science and college of technology library of the Federal University of Petroleum Resources was established in the year 2014 by the former Acting Librarian Mr. Matthew Okoh. The library was established to serve faculty members, students and other researchers in the sciences. The college of science library disseminates reference materials and other books related to sciences which includes; Mathematics, computer science, Geology and Earth Science, Physics, chemistry and Environmental Sciences.

College of technology: The College of technology library was established to serve faculty members, students and other researchers in the engineering and technology related fields. The library houses reference sources and other books related to engineering and technology which includes: Engineering Mathematics, Marine Engineering, Electrical and Electronics Engineering, Mechanical Engineering and Petroleum Engineering. The College of Science and College of technology libraries are in line with the library management mission to bring library services closer to its patrons with the aim of easing their stress of coming to the main library whenever they have information needs. (Federal University of Petroleum Resources, Library Handbook, 2014).

Objectives of the study

This study sought to establish the use of Smartphone's for information seeking by undergraduate students. To attain this goal, the study stipulated the following objectives:

- To find out the types of Smart phone's used for information seeking by undergraduate students.
- To ascertain how undergraduate students demand for information using their smart phones.

- To know the use to which undergraduate students put the information they get via their smart phones.

- Extent of the use of smart phones by undergraduate's student.

- To find out the factors militating against the use of smart phones for information seeking by undergraduates students.

Research questions

For the purpose of this study, the following questions have been formulated:

- What are the types of smart phone's used for information seeking by undergraduate students?

- How do undergraduate students demand for information using their smart phones?

- To what use do undergraduate students put the information they get via their smart phones?

- To what extent do undergraduate students use smart phones?

- What are the factors militating against the use of smart phones for information seeking by undergraduates students.

Literature review

The first concepts that eventually led to the invention of Smartphone date back to the 1970s. It was not however until 1992 that IBM came up with a prototype mobile phone that incorporated Personal Digital Assistant (PDA) features. The device was demonstrated the same year at a computer industry trade show called COMDEX. In 1994, BellSouth came up with a more refined version of the phone and called it the Simon Personal Communicator. This is the first device that could really be referred to as a Smartphone. The Simon Personal Communicator was able to make and receive calls, send faxes and emails, and more (The Snugg, 2014). This review deals with the relevant literature and studies on the use of smart phones by undergraduate students which covers topics on the types of smarts phones used by undergraduate students, how undergraduates students demand for information using their smart phones, the use of information derived from smart phones by undergraduates, extent to which undergraduates meet their information needs using smart phones and the factors militating against the use of smart phones by undergraduates.

Rung, Warnke and Mattheos (2014), investigated the use of smart phones for learning purposes by Australian dental students. The findings of this study revealed that out of the 232

respondents, 204 (87.9%) owned a Smartphone, and 191 (82.3%) had access to third generation (3G) mobile carriers and the most popular devices used by the students were iPhone and Android. Similarly, Farley, et.al (2015), carried out a study on how students use their mobile devices to support learning a case of Australian Regional University. The finding of this study revealed that 52% of respondents use Apple iOS, 44% Google Android while only 3% use a Window Phone. Sarraf, Brooks and Cole (2014), did a study to look at mobile device usage among college students. The study revealed that 68% of the respondents use Android IOS while 61% uses iPhone.

The study of Alson and Misagal (2016), on smart phones usage among college students revealed that Smartphone's are used to search information on Google, Bing and Yahoo, get school announcements, to get news and weather updates. It is least used in getting Sports updates. Catharine (2013), carried out a study on educational use of smart phone technology: A survey of mobile phone application use by undergraduate university students revealed that student demand for information from search engines, online encyclopaedias, and libraries. Purcell et al (2012), carried out a study on how teens do research in the digital world. The findings of this study revealed that 94% of the respondents demand for information using Google or other online search engine, 75% Wikipedia or other online encyclopaedia, 52% YouTube or other social media sites, 18% electronic textbooks. Similarly, the Study of Hanson, Drumheller, Mallard, McKee and Schlegel (2011), revealed that students in the library used email, instant messaging and web-surfing rather than checking the library's online resources. Although students want to make academics a priority, they have a difficult time balancing their school life with their need for financial and social support

Also, Rung, Warnke, and Mattheos (2014), investigated the use of Smartphones for Learning Purposes by Australian Dental Students. The findings of the study showed that most of the respondents had intermediate Smartphone skills and used smartphones for a number of learning activities. Only (32.3%) had specific educational applications installed, (63.7%) used smartphones to access to social media and found it valuable for their education (P<.05). According to Nielsen (2013) a new study conducted by TRU provides a body of research which supports the idea that students use cell phones to learn, and also that schools are not acknowledging or supporting them fully, yet. The findings of the study revealed that Hispanic and African American middle school students are using the smartphones for homework more than Caucasian students. Nearly one half of all Hispanic middle school students (49%) report using smartphones for homework. Smartphone use for homework also crosses income levels

with nearly one in three (29%) of students from the lowest income households reporting Smartphone usage to do their homework assignments. Similarly, Noor, et al (2013), study on importance of smart phones usage among Malaysian undergraduates. The study find out that The most popular features on the smartphone that the respondents" used were mostly to send and receive text messages (97.9%), take pictures (97.1%), play music (96.1%), setting the alarm (95.8%), referring to the calendar (94.5%), recording videos (92.5%), play games (91.9%), and exchanging pictures via Bluetooth (91.7%). Similar with previous research (Thulin, and Vilhelmson, 2007), text messages had become important means that helped to maintain the respondents" interaction with others. Furthermore similar with this research, other research also reported that the most popular features were taking pictures and playing music (Thulin, & Vilhelmson, 2007).

Cavanagh (2013), undertook a study on smartphones a Standard for Majority of Students by High School. The new nationwide survey reveals the extent to which mobile devices have become an inextricable part of students. The findings of the study revealed that 65% of students use Smartphone on a daily basis, 28% uses Smartphone weekly and 6% use them less often. Thornton and Houser (2005), examined the extent to which mobile phones were being utilised for educational purposes. They used mobile phones to provide vocabulary instruction by Short Message Service (SMS) at a Japanese university, and created a website for English idioms. The results showed that the students who learned via SMS were twice as successful in the learning of vocabulary items when compared to those who received their lessons on a paper-based system. Likewise, Barrs (2011), conducted an investigation into the extent to which students use their smartphones for language learning in her classes. The students are reported to have used their Smartphone features and apps while learning a language. For example, they used the built-in voice recorder to record a pair-presentation practice; some used English language news apps like those made available by the British Broadcasting Corporation (BBC); where several of them used flashcard apps, and so on. Mamudu and Oyewo (2015), undertook a study on the use of mobile phones for academic purposes by Law Students of Igbinedion University, Okada Nigeria. The study shows that 13.5% spend between 30 minutes to 1 hour daily using their mobile phones to browse the internet, while 25% spend 2 hours and 48.7% spend 3 hours and above, daily. 12.8% of the respondents did not give any answer. From the above, the higher percentage of the students uses their phone to browse the internet for three hours or more daily.

Cawley (2015) affirm that there are seven common smart phone issues that get in the way of enjoying smart phone usage. The report detailed three particular categories' that show when

these issues typically occur: battery-related, speed-related, and storage space-related. He further listed some of the problems with smart phones to include but not limited to: overheating, too much trash, slow online speeds, not enough space, phone crashes, slow response time and finally, not enough standby time. The study of Joy, Uzezi and Emmanuel (2017), on use and impact of smart phones by Medical Students for Laboratory/ Educational Purposes at Ambrose Alli University, Ekpoma, Edo State revealed that that majority of the respondents indicated lack of technical experts on repairs when faulty within campus, operational difficulties/ poor usage skills, high cost of data subscription/ internet access from service provider and fragility (easily damaged). Others are: Insecurity of usage due to high rate of theft on campus, irregular/ unstable power supply for regular charging of battery on campus and distraction from unnecessary use of social media when studying were the other barriers facing the use of smart phones in medical education. Elder (2013), studies explored college students self-reported cell phone usage and beliefs and investigated the effect on student learning. The findings of the study reported that 85% of university faculty and students both said cell phones were distracting and 45% noticed that vibrating phones in the classrooms were problematic. Boruff and Stories (2014), affirmed that a poor usage skill is another serious barrier militating against the effective use of smart phones for medical education.

Methodology

Research design

A descriptive survey designs was adopted for this study because it was considered appropriate. It involves a systematic and comprehensive collection of information about the opinions, attitudes, feelings, beliefs, and behaviours of people (Aina and Ajiferuke, 2002).

Population

The population for the study comprises the registered users of the federal university of petroleum resources, Effurun (FUPRE) library numbering 2,313 (Registration statistics, 2017/2018 academic session). A total of 1,670 respondents were selected out of the total population.

Sampling technique

The stratified random sampling technique was used to select respondents across the two college libraries in the university. These are College of technology library and College of science library. This means that those qualified to participate in this research need to own a smartphone.

Prior to conducting the actual data collection. A sample of 1,403 (84%) respondents was drawn and used for the study.

Instruments for data collection

Questionnaire was designed and used for data collection. It was designed based on the objectives of this study. The questionnaire titled "use of smart phones for information seeking by undergraduate students". The questionnaire comprised two parts, the first part was designed to gather demographic information of the respondents while the second part of the questionnaire was administered to collect information in line with objectives of the study.

Reliability and validity of the instrument

A test retests method was used to measure the performance of the instrument and it provided a reliability coefficient of 0.80. The instrument was given to three experts in the field of library and information science at the University of Ilorin, Ilorin. The instrument was then modified in line with the suggestions by these experts. The researchers personally carried out a pilot study by administering 20 copies of the questionnaires among library users in Niger Delta University, Bayelsa State which is outside the study area. This was done to check the appropriateness of the instrument.

Results and discussion

Out of 1,670 copies of the questionnaire that were administered to the students, 1,403 (84%) were retrieved. The data collected in the study is presented below.

Demographic information of respondents

Table 1: Distribution of respondents by gender

Gender	Frequency	Percentage
Male	1021	73%
Female	382	27%
Total	1,403	100

The sample for this study consists of 1,403 respondents as shown in table 1.Respondents are made up 73% male while 27% are female. This represents the gender distribution of undergraduate students involved in the survey.

Table II: *Age distribution of the respondents*

Age range	Frequency	Percentage
18 -20	369	26%
21- 23	286	20%
24 -26	275	20%
27 -30	232	17%
Above 30	241	17%
Total	1,403	100%

Table 2 shows the age range of respondents. (83%) were between the ages 18 and 30 while (17%) were 30 above. This indicates that the majority of the undergraduate student's using the libraries are youths.

Table III:

Research question 1: What are the types of smart phone's used for information seeking by undergraduate students*?*

Types of smart phones	Frequency	Percentage
Apple iOS	289	21%
Google Android	277	20%
Blackberry	213	15%
Window Phone	119	8%
Symbian	119	8%
Open WebOS	176	13%
MeeGo	179	13%
Others	31	2%
Total	1,403	100

Table 3 shown that apple iOS 21% topped the highest types of smart phone used for information seeking by undergraduate students, google android 20%, blackberry 15%, open WebOS/ MeeGo 13%, window phone/ Symbian 8% and 2% others. This may be as a result of different feature smartphones. This finding substantiates the findings of Farley, et.al (2015) who found that 52% use Apple IOS, 44% Google Android while only 3% use a Window phone. In the same vein Sarraf, Brooks and Cole (2014) confirmed that 68% of the respondents use Android IOS while 61% uses iPhone**.**

Table IV:

Research question 2: How do you demand for information using smart phones?

Demand for information using smart phones	Frequency	Percentage
Search Engines	352	25%
Online Encyclopedia	275	20%
Online Dictionaries	211	15%
Social Media	281	20%
University Website	43	3%
Databases	73	5%
Educational Software's	53	4%
Institutional Repository	32	2%
Mobile Apps	61	4%
Others	22	2%
Total	1,403	100

Table 4 indicates that 25% of respondents demand for information through search engines, 20% online encyclopaedia/ social media, 15% online dictionary, 5% databases, 4% educational software's/ mobile apps while institutional repository and others 2%. Confirming this finding, Catharine (2013) found that student demand for information from search engines, online encyclopaedias, and libraries. Supported by Purcell et al (2012) noted that 94% of the respondents demand for information using Google or other online search engine, 75%

Wikipedia or other online encyclopaedia, 52% YouTube or other social media sites, 18% electronic textbooks.

Table V:

Research question 3: To what use do undergraduate students put the information they get via their smart phones?

Use of information gotten via smartphones	Frequency	Percentage
Educational advancement	88	6%
Personal self-development	89	6%
To get current news	111	8%
To know advancements in science and technology	86	6%
To get health related information	33	3%
Sport Updates	45	3%
Exchange picture via Bluetooth	108	8%
Play games	63	4%
Play music	33	2%
Take pictures	105	7%
Send/receive messages	627	45%
Others	15	1%
Total	1,403	100

Table 4 revealed that 45% send/receive message topped the highest use of information gotten via smartphones, 8% to get current news, exchange picture via Bluetooth and 7% take pictures among others. This finding corroborates with finding of Noor, et al (2013) find out that the most popular features on the smartphone that the respondents used were mostly to send and receive text messages (97.9%), take pictures (97.1%), play music (96.1%), setting the alarm (95.8%), referring to the calendar (94.5%), recording videos (92.5%), play games (91.9%), and exchanging pictures via Bluetooth (91.7%).

Table VI*:*

Research question 4: Extent of the use smart phones by undergraduate students?

Extent of the use of Smart Phones	Number of respondents	Percentage
Very large extent	565	40%
Large extent	357	25%
Little extent	263	19%
Very little extent	218	16%
Total	1,403	100

Table 5 shown extent of the use of smart phones by respondents 40% very large extent, 25% large extent, 19% little extent, and 16% very little extent. This finding is in consonance with finding of Cavanagh (2012) that 65% of students use Smartphone on a daily basis, 28% uses Smartphone weekly and 6% use them less often.

Table VII*:*

Research question 5: What are the factors militating against the use of smart phones for information seeking by undergraduates students

Factors militating against the use of Smart Phones	Frequency	Percentage
Lack of technical experts on repairs when faulty within campus	971	69%
Poor Battery	1,324	94%
Unstable power supply for regular charging	731	52%
Operational difficulties	532	38%
Poor usage skills	765	55%
High cost of data subscription/ Internet access	971	69%
Fragility	879	63%
High rate of theft on campus	1,234	88%
No Enough Space to store information	654	47%
Phone crashes	897	64%

Others	76	5%

N.B: *Respondents are allow to choose more than one options*

It is clear in table 6, that factors affecting the use of smart phones for information seeking by undergraduate students is poor battery 94%, high rate of theft on campus 88%, lack of technical expert on repairs when faulty within campus/high cost of data subscription/ Internet access 69%, phone crashes 64%, fragility 63%, poor usage skills 55%, unstable power supply for regular charging 52%, no enough space to store information 47%, operational difficulties 38% and 5% others. This finding substantiates the findings of Joy, Uzezi and Emmanuel (2017) who found that lack of technical experts on repairs when faulty within campus, operational difficulties/ poor usage skills, high cost of data subscription/ internet access from service provider and fragility (easily damaged). In the same vein Baidu (2015) listed some of the problems with smart phones to include but not limited to: overheating, too much trash, slow online speeds, not enough space, phone crashes, slow response time and finally, not enough standby time.

Conclusion

The use of smartphones in Nigeria is growing rapidly because of the multiple features embedded in them. Professionals in divers field uses smartphones to enhance their services and boost performance, same is applicable to undergraduate's students. The study was conducted to ascertain the use of smartphone for information seeking by undergraduate students of the college of science and college of technology, Federal University of Petroleum Resources, Effurun. The study revealed that a vast majority of undergraduate's students from both colleges in FUPRE uses apple iOS. Undergraduate students demand for information using their smartphones mainly from search engines, online encyclopaedia and online dictionaries. Students in FUPRE use the information they get via their smartphones for educational advancement, personal self-development, and to get current news. The factors in the top chart militating against the use of smartphones for information seeking by undergraduate students are Lack of technical experts on repairs when faulty within campus, Poor battery life, Unstable power supply for regular charging, operational difficulties, poor usage skills, high cost of data subscription to mention but a few.

Recommendations

Based on the findings, the researchers recommend the following:

- Undergraduates students at all levels should be encouraged to use smartphones for academic works.
- Smartphones repairers/ technicians should be encouraged to take a space within the campus to repair faulty phones.
- Regular training should be conducted for undergraduate's students on how to maximize access to information using their smart phones.
- Regular power supply should be made available on campuses to enable students to charge their smartphones and other electronic gadgets.
- The cost of smartphones should be subsidized for undergraduate students to increase their purchasing power.
- Internet provider should subsidize subscription prices of bandwidth for undergraduate students on campuses.

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