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# Factors determining the adoption of mobile communication devices for research and academic purposes among students of Delta State Polytechnic, Otefe-Oghara

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**This study is on the factors that determine the adoption of mobile communication for research and academic purposes by students of Delta State Polytechnic, Otefe-Oghara. The study adopted descriptive design. The population of the study consists of 1,102 second year students of 2022/2023 academic session in the higher national diploma studies (HND 2) drawn from the three schools of the polytechnic namely schools of Applied Sciences and Technology, Business Studies and Engineering. A sample size of 285 was drawn for the study through random sampling technique. The study adopted mixed method approach to collect quantitative and qualitative data using questionnaires and interview methods. The objectives of the study are - to examine the purposes for which Delta State Polytechnic, Otefe-Oghara students' use mobile communication devices. To identify the mobile communication devices used by Delta State Polytechnic, Otefe-Oghara students' and to examine the factors that determines the adoption and use of mobile communication for research academic purposes by Delta State Polytechnic, Otefe-Oghara students'. The results from the findings indicate that the adoption of mobile communication is hindered by poor ICT infrastructures in the polytechnic. Another major hindrance is inability of majority of students to connect to the internet. The study therefore recommends the polytechnic management acquires ICT gadgets and install internet for the effective use of mobile communication devices for academic and research purposes at the Delta State Polytechnic, Otefe.**

**Keywords:** mobile communication, Delta State Polytechnic, Otefe-Oghara; higher national diploma; ICT.

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## INTRODUCTION

The importance of communication cannot be over stressed in human endeavors and more so in tertiary education. Gladly enough the advancement in communication technology has reduced the arduous challenges of information communication, transmission and sharing, to a surmountable one. Consequently, people in all works of life and social statues are taking advantage of the opportunities presented by mobile communication to better their lives. Moreover, the

ever-increasing number of applicants seeking admission to institutions of higher learning is an indication that people are aware of the importance of getting formal education, so also, is the awareness and adoption of mobile communication. Needless to say, the widespread use of cell phones and other ICT tools for communication which cut across people of every social statue from every society. The current generation is using this technology in all aspects of their lives, and expects a similar experience when they step onto a college campus (Communications Whitepaper, 2018). With the high rate of awareness of and use of mobile communication inherent among members of the society especially youths it will be worthwhile to adopt mobile communication for research and academic purposes in Delta State Polytechnic Otefe-Oghara.

Education on the other hand is a two-way interactive process that requires the active involvement of both the learner and the teacher for meaningful result. The institution has the responsibility to provide and deliver her educational resources and services in a user-friendly mode.

Moreover, the work of tertiary institutions has become more challenging as students' population increases every year, increasing responsibility while the lecturers do not. The introduction of a means of managing the institution for effectiveness is a welcome relief. Ozuorcun and Tabak(2012) therefore suggested that a good implementation of mobile communication for teaching and learning will complement and add value to existing formal learning, teaching, assessment and educational administration and management in tertiary institutions. Some mobile communication technologies used in education as identified by Maiti and Tripathy (2012) include mobile phones, Smart phones, PDAs, MP3/MP4 players, e-book readers (e.g. Kindle), notebooks, tablets (e.g. iPad, Galaxy Tab), hybrid tablet/Smart phone gadgets (e.g. Galaxy Note), laptops and specialist portable technologies used in science laboratories. These are used to for information access and sharing, they are unique because they do not need to remain in one place to perform their functions. The adoption of mobile communication therefore, will promote collaborative learning, extends learning beyond lecture theatres and diminishes barriers such as distance and space significantly. It shall also create avenue for learners to share information and interact with one another and share knowledge any time (Shaibu, Mike, Solomon and Jarkko, 2016).

**Statement of problem/Justification**

The advancement in information communication technology is on a steady rise. Mobile communication technologies have progressed and experienced developmental changes spanning through first, second, third and fourth generations. We are presently experiencing the wake of the fifth generation. Devices such as the mobile phone are visibly an everyday commodity for millions of people worldwide. The extensive use of mobile communications devices is also visible among members of most tertiary institutions. All these observations made above are true to the situation of the students in Delta State Polytechnic Otefe-Oghara. Moreover, with the growing cost of living and health challenges that have disrupted the general flow of life globally, are Delta State Polytechnic, Otefe students able to meet up with research and academic work with the existing learning method? With these challenges, are the students able to attend lectures up to the requirement of the institution? In addition to the above the authors as librarians have observed with dissatisfaction the poor state of projects output of some students submitted to library. It is assumed that students lack what it takes to put proper academic project in the Polytechnic. However, it has not been ascertained yet what factors are responsible for the drawbacks observed. Against this backdrop, this study shall examine the factors determining the adoption of mobile communication for research and academic purposes among students of Delta State Polytechnic, Otefe-Oghara. The study shall attempt to examine the impacts the adoption of mobile communication shall have on the research and academic works of the polytechnic students and attempt to get a broad understanding of the effects of having lecturers to engage students remotely through mobile communication devices.

The idea of this study is born out of the fact that mobile communication and the internet have gained so much popularity and are extensively used by people across all works of life. As part of her educational policy, the United Nations' Educational, Scientific and Cultural Organization (UNESCO) (2011) has suggested mobile devices as important tools in teaching and learning. It is therefore important to investigate how mobile communication can be used to enhance research and academic work of the students of Delta State Polytechnic, Otefe-Oghara, the outcome of the study shall be useful and the factors that encourage its adoption by the students.

The outcome of this study shall be useful as it will highlight the impact of the adoption and use of mobile communication will have on research and academic work of Delta State Polytechnic Students by providing useful information on students' readiness for the change. Another envisaged outcome of the study is that it will reveal areas where students and lecturers may need assistance as they use mobile communication in teaching and learning. It is also important to note that studies of this nature are limited about Delta State Polytechnic Otefe-Oghara, it is therefore significant as it will add to existing body of knowledge on impact of mobile communication in education.

**Objective of the study**

The objectives of the study are to –

To examine the purposes for which Delta State Polytechnic, Otefe-Oghara students' use mobile communication devices.
To identify the mobile communication devices used by Delta State Polytechnic, Otefe-Oghara students'.
Examine the factors that determine the adoption and use of mobile communication for research academic purposes by Delta State Polytechnic, Otefe-Oghara students'.

**The study was guided by the following research questions:**

For what purpose do Delta State Polytechnic, Otefe-Oghara students' use moble communication devices?
What types of mobile communication devices are used by Delta State Polytechnic students Otefe-Oghara?
What factors will encourage the adoption and use of mobile communication for academic and research purposes by Delta State Polytechnic, Otefe-Oghara students'?

**Literature Review**

Since its inception in the early 1960s, mobile communication systems have experienced unprecedented popularity and rapid development enabled by technological advancement (Abatan and Maharaj, 2016). Over the years, it has undergone several transition phases. The different transition phases are marked with evolutionary developments which built and improved on existing ones. The first generation (1G)was introduced in 1981, second generation (2G) introduced in 1992 which witnessed the introduction of Global System for Mobile Communications (GSM), third generation (3G) introduced in 2001 and the fourth generation (4G) introduced in 2010. The fifth generation (5G) mobile communications technology introduced in 2020 is gradually gaining grounds (Agarwal1 et al., (2019); Naghmash and Abed (2018); Dunnewijk, and Hulte (2007)). The aftermath of these evolution and upgrades of mobile communications technologies is its extensive diffusion into every aspect of human life. A study conducted in 2011 on global ICT trends, 87% of the world's population now has a mobile phone (ITU, 2011). In a report of mobile cellular subscription by World Bank (2016) it was pointed out that the mobile device is going universal which is revealed by their report which recorded a rapid increase in the number of mobile subscribers per 100 people from 12.075 in 2000 to 98.622 in 2015. Another study by UNESCO (2012), reports over 5.9 billion mobile phone subscriptions worldwide. In Africa, it was reported that the number of mobile phone users, totaled 600,000 in 1995, and this number is expected to surpass 735 million before the end of 2012. This increase was attributed to the declining cost of owning a phone.

In Nigeria, Pew Research (2017) revealed that 80% of adults in Nigeria owned some type of mobile phone, though the most common phone type was a basic mobile phone which does not connect to the internet (Oyelola 2021).In a release by the Nigerian Communication Commission (NCC) 2018, there are was an increase the in the number of active mobile communications user from 85% in 2012 to 88% by 2016. Similarly, in the same period the International Telecommunication Union (ITU) (2018), reported a rise in the number of mobile communication subscribers from 41% in 2012 to 83% in 2016. The indication from these reports point to the fact increasingly the Nigerian society is becoming savvy of the importance of mobile communication. A hick in the penetration of mobile communication has already been predicted for 2025 to an estimate of about 130 million or about 60 – 65% of the total population 2025 from about 50% in 2018 (Eyelola, 2021).

Some scholars however are of the view that the rate of adoption and use of mobile -communication is slow in the Nigerian society (GSMA, 2015; Gillwald et al., 2018; Forenbacher; Husnjak; Cvitic and Jovovic,2019), suggesting investigation of the determinants of mobile communications adoption. This is in comparison with developed countries and sub-Saharan countries like Kenya, South Africa and Ghana (Ozuorcun and Tabak, 2021). It is comforting to know that there is an increase which studies have identified to be steady. According to Sophonhiranrak (2021), mobile communication devices are likely to the most prominent among the 21$^{st}$ century learning tool. The penetration rate of mobile communication (smart phones) devices among millennial and Gen Z according to Communications Whitepaper (2018), is 97% and (rising). This clearly has changed information communication landscape. Commenting on the perceptions of GSM on the Nigerian economy, Ajiboye, Adu, and Wojuade, (2007), concluded that the implementation of GSM standards has contributed directly and indirectly to the global economic growth, it contributed to the creation of new jobs opportunities and have enhanced the Gross Domestic Product of every nation. UNESCO (2012) identified several features associated with the adoption of mobile communication for research and academic purposes. Mobile communication devices have the potentials of breaking boundaries' barriers and reaching students outside the reach of

conventional educational systems. Secondly, mobile devices can serve as an effective tool to support lectures, administrative and information communication for both lecturers and students.

The portability of mobile communication devices and their facilitation of quick access and retrieval of information, collaborative learning, situated learning (Gikas and Grant, 2013) and the ability to reach out remotely make it a promising research and learning device (Davies et al., 2012). Indeed, mobile communication devices have become more available and are increasingly owned by youths (Ezemenaka, 2013). Considering the increasing number of people that are using mobile communication in their daily lives it will be worthwhile to explore how these devices might be used to improve research output and enhance academic performance of students, hence this study.

## METHODOLOGY

The study adopts the descriptive survey method because it sought to explore the factor that determines the adoption of mobile communication for research and academic purposes among students of Delta State Polytechnic, Otefe-Oghara. The population of the study consists of 2022/2023 session second year students in the higher national diploma studies (HND 2 students) drawn from the three schools of the polytechnic namely schools of Applied Sciences and Technology, Business Studies and Engineering and school of engineering. The choice of HND2 students is that they are at the peak of their studies in the polytechnic and are more engaged with writing of seminar papers and projects. The school of applied sciences and technology has a total of **455** students (which comprises of science laboratory technology (SLT) (280 students), computer science (CS) (155 students) and statistics (STAT) (20 students)). The school of business studies comprise of departments of business administration and management studies (BAM) (191students), accountancy (ACC) (110 students,) and banking and finance (B/F) (112 students) totaling **413** students. Finally, the school of engineering has **234** students with three departments where HND programs (computer engineering (53 students), electrical/electronic engineering (95 students) and mechanical engineering (86 students)). The total population for the study therefore is **1,102** students. A sample size of **285** was drawn for the study. The sample size was determined using the information oriented purposive sampling technique. Hence students selected were representatives from all departments from the three schools in the polytechnic. The study used a mixed method in gathering data for this research project. This according to Cresswell and Clark (2015) increases the understanding of the problem of a study by gaining divers corresponding data and enhances data validation. The major data collection means was through self-constructed questionnaire titled “Factors determining the adoption of mobile communication for research and academic purposes among students of Delta State Polytechnic, Otefe-Oghara (DSPO) Questionnaire”. A face to face interview was used to collect data to complement data collected from questionnaire.

A pre-test was conducted before the actual test. This was used to ascertain the reliability of the research instruments and to validate the data before the final instrument was developed and administered.

Table I shows the distribution of the population of the according to their various schools and departments and the sample size drawn for the study.

**Table 1.** Study population and sample size

| **School** | **Applied sciences and technology** | | | **School of business studies** | | | **School of engineering** | | | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Departments** | CS | SLT | STAT | ACC | BAM | BF | CE | E/E | MECH | |
| **Population** | 150 | 280 | 20 | 117 | 191 | 112 | 50 | 95 | 85 | 1,100 |
| **Total** | | 450 | | | 420 | | | 230 | | |
| **Sample size** | | 112 | | | 110 | | | 63 | | 285 |

Qualitative and quantitative data collected were prepared using thematic analysis and statistical analysis respectively by the help of SPSS. Simple frequency counts and percentage are generated. All results are presented in charts and tables.

***Findings, analysis and discussion***

**Table 2.** Response rate

| School | Total population | Response rate |
|---|---|---|
| Applied sciences & Tech | 112 (39.3%) | 105 (36.8%) |
| Business studies | 110 (38.6%) | 107(37.5%) |
| Engineering | 63 (22.2%) | 53 (18.6%) |
| Total | 285 (100%) | 265 (92.9%) |

The data presented in table 2 shows that out of the 285 questionnaires distributed 265 were returned and found useable for the study. 265 responses gave a response rate of 92.9%. Maxfield and Babbie, (2015) opine that a response rate of this rage is appropriate in a study to represent the entire population. This is also supported by Fincham (2008) who asserts that a response rate of 80% is expected and acceptable for a survey research intended to represent an entire population.

**Table 3.** Gender of respondents **N =265**

| | Frequency % | | |
|---|---|---|---|
| **School** | **Female** | **Male** | **Total %** |
| **Applied & tech. sciences** | 47 | 58 | 105 (39.6%) |
| **Business studies** | 77 | 30 | 107 (40.4%) |
| **Engineering** | 17 | 36 | 53 (20%) |
| **Total** | 141 (53.2%) | 121 (46.8 %) | 265 (100%) |

The data presented in table 3 shows that respondents consist of more female students (141, 52.1%) while the male students were 121 (46.8%). A closer look at the data shows that the school of business administration has the highest number of female students (77) while school of Applied Sciences and technology has the highest number of male students (58), with the school of engineering recording the lowest number (17) of female students. This supports the assumption that females are more inclined to studying disciplines in the arts and social sciences and humanities than the sciences.

**Research Question One**

Research question one sought to find out what types of devices are used by the students of Delta State Polytechnic students Otefe-Oghara. Respondents were allowed to tick more than one option as applicable to them.

**Table 3.** Type(s) of mobile device owned by respondents **N=265**

| Types of mobile communication | F | % |
|---|---|---|
| Smart phone | 115 | 43.4 |
| Feature phone (small cheap button phones) | 215 | 81.1 |
| Ultra-mobile PC | 7 | 2.6 |
| iPad or iPod | 25 | 9.4 |
| Tablet computer | 7 | 2.6 |
| E-reader | - | - |
| PDA (personal digital assistance) | 3 | 1.1 |
| Notebook | - | - |
| Smart watch | 13 | 4.9 |
| Others specify | - | - |

The findings as presented on table 3 shows that the highest percentage (81.1%) of the respondents has feature phones (small cheap button phones). This is followed by smart phone owners (43.4%). Other categories of mobile devices owned by the other respondents include iPad or iPod owned by 9.4% of the respondents, smart watch owned by 4.9%, ultra-mobile PC and tablet computer are owned by 2.6% each and 1.1% owned PDA (personal digital assistance). The high number of respondents who indicated ownership of feature phone shows that most of the

respondents own more than one type of mobile device. It is also clear that less than half of the entire respondents own smart phones, and yet a fewer number indicated ownership of other sophisticated devices which can be used to connect internet. It is significant to note however that all of the respondents indicated to have a mobile device irrespective of its quality.

**Research question 2:** For what purpose do you use your mobile communication? Research question sought to find out the purpose for which respondents use their mobile devices.

**Table 4.** purpose of using mobile devices

| Purpose of use of mobile device | Most times | Rarely | Sometimes | Never |
|---|---|---|---|---|
| **Entertainment** | | | | |
| Play games | 176(66.4%) | 43(16.2%) | 43(16.2%) | 3(1.1%) |
| Watch movies | 100(37.7%) | 5(1.9%) | 10(3.8%) | 150(56.6%) |
| Play/listen to music | 65(24.5%) | 7(2.6%) | 178 (67.2%) | 15(5.9%) |
| **Social activities** | | | | |
| Sending text messages | 265(100%) | - | - | - |
| Chatting with friends on whatsapp | 113(42.6%) | - | 2(0.8%) | 150(56.6%) |
| Instagram | 55(20.8%) | - | 33(12.5%) | 27(10.2%) |
| Facebook | 95(35.8%) | 10(3.8%) | 10(3.8%) | 150(56.6%) |
| Youtube | 76(28.7%) | 5(1.9%) | 30(11.3%) | 4(1.5%) |
| Twitter | 55(20.8%) | - | 33(12.5%) | 27(10.2%) |
| **Academic purpose**s | | | | |
| Taking/recording of lecture notes | 35(13.2%) | 20(7.5%) | 55(20.8%) | 155(58.5%) |
| Doing assignment | 75(28.3%) | 3(1.1%) | 30(11.3%) | 157(59.2%) |
| Submitting assignments | 30(11.3%) | - | - | 235(88.7%) |
| **Research purpose** | | | | |
| Searching for information for my seminar/project work | 112(42.3%) | - | 3(1.1%) | 150(56.6%) |
| Collaborating with classmates for group project and conferencing | 87(32.8%) | 13(4.9%) | 10(3.8%) | 155(58.5%) |
| Others specify | | | | |

The analysis on table 4 shows that under the purpose of social activities all the respondents (265) indicated that they use their devices most times for the purpose of sending text messages. This is followed by 178 respondents who indicated under entertainment purpose that they use their devices sometimes to play/listen to music and chatting on whatsapp which 113 respondents indicated they use most times. For academic purposes 75 respondents indicated doing assignment most times with their devices, 35 respondents indicated taking/recording lecture notes most time and also 30 respondents agreed to use their devices most times for submitting assignments. While for research purposes 112 respondents agreed they use their devices for searching for information for their project work, another 87 admitted using their devices for collaborating with classmates for group work most times as well. A closer look reveals that more than half of the entire respondents (150) indicated never using their devices to watch movies (entertainment purpose) and chatting on Whatsapp and Facebook (social activities purpose). Similarly majority of the respondents indicated they never used their devices for submitting assignments (235), doing assignments (157) and taking/recording lecture notes (150) (academic purposes). While under research purposes 150 and 155 respondents admitted they never used their devices for searching for information for their seminar/project works and collaborating with classmates for group project and conferencing respectively. It can be inferred from this result that majority of the students who participated in this study do not have devices that connect to the internet which can be used meaningfully for research and academic purposes.

**Research question 3**: What factors will encourage the adoption and use of mobile communication for academic and research purposes by Delta State Polytechnic, Otefe-Oghara students'?

**Table 5.** Factors that can encourage the use of mobile communication for research and academics

| Factors | Strongly agree | Agree | Strongly disagree | Disagree |
|---|---|---|---|---|
| Access to internet | 165(62.3%) | 100(37.7%) | - | - |
| Access to suitable mobile device | 215(81.1%) | 50(18.9%) | - | - |
| Knowledge of how to use mobile device for research and academic | 176(66.4%) | 89(33.6%) | - | - |
| Incorporate it in teaching/learning process | 120(45.3%) | 145(54.7%) | - | - |
| Encouragement by lecturers | 115(43.4%) | 135(50.9%) | - | 15(5.7%) |
| Enlightenment/awareness on the benefits of using mobile device for research and academic purposes | 156(58.9%) | 109(41.1%) | - | - |

The data presented in table 5 reveals 62.3% of the respondents strongly agreed while 37.7% agreed that access to internet connectivity will influence their decision to adopt mobile device for academic and research purposes. 81.1% and 18.9% of the respondents strongly agreed and agree respectively that access to suitable device can encourage them to adopt mobile devices research and academic purposes. Similarly all participants either strongly agreed or agreed that Knowledge of how to use mobile device for research and academic (66.4% and 33.4%), Incorporate it in teaching/learning process (45.3% and 54.7%), enlightenment/awareness on the benefits of using mobile device for research and academic purposes (58.9% and 41.1%). Finally 5.7% of the respondents strongly disagreed that encouragement by lecturers will encourage the adoption of mobile devices for academic and research purposes.

## CONCLUSION

The purpose of the study is to examine the factors that will encourage the adoption and use of mobile communication by students for research and academic purposes to the end that students' research productivity will be enhanced as well as their academic work. Concerning research question one; the study found that all the participants had at least one mobile device. Some respondents indicated having several mobile devices. This finding corroborates with the global phenomenon of mobile device use becoming practically universal worldwide (World Bank, 2016). It can therefore be assumed that the adoption and use of mobile device by Delta State Polytechnic Otefe-Oghara students will not pose too much problem as a significant number of them already have an mobile devices. Regarding research question two, it was also revealed that a considerable percentage of the participants already make use of their mobile devices for research and academic purposes. This is particularly significant because mobile devices features of portability, and its ability to facilitate rapid retrieval of information, collaborative and situated learning make them promising as veritable tool for research and academics (Daviies et al, 2012; Gikas & Grant, 2013).

Finally the findings regarding research question three reveals that the participants will embrace the use of mobile devices for their learning if the enabling environment is provided. This includes among others the information communication facilities (access to internet and access to suitable mobile devices). Other crucial factors are the incorporation of the use in teaching/learning process of the polytechnic and also enlightening students on the benefits of using mobile device for research and academic purposes. Based on the overall findings it can be said that the Delta State Polytechnic students are to adopt mobile communication for research and academic purposes.

## RECOMMENDATIONS

Based on findings it is recommended that the institution collaborates with the government and come up with a policy on making the use of mobile devices part of teaching/learning process. This will also include the institution and government providing the facilities to make the process work.It is also recommended that the institutions take it upon themselves to give students instructions and lessons on how to use their devices for research and academic purposes.

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