

# Assessing the Impact of the Internet as a Learning Resource among Students At Some Selected Polytechnics in Northeast Nigeria.

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## ABSTRACT

The primary goal of this work is to assess the impact of the internet as a learning resource among students of polytechnics in northeast Nigeria. This study, which is attached on the uses and indulgence, adopted a survey among 380 students out of total population of 2,930. The students perceived that the lack of digital willingness among their staff and institution, the absence of digital library for easy accessibility to journals from the scientific database, and ineffective cybercafé and internet facility within their polytechnics locations were the main problem depressing the impact of internet within their institutions. Nonetheless, they continue to try to find ways to use the internet to help their studies through self-organization, flexibility, and inventiveness. The majority of them stated that they use their smartphones/handsets to access the internet through other internet providers' subscriptions. The most popular search engines were discovered to be Google and Google Scholar. The students agreed that using the internet allowed them to conduct research ahead of time, complete multiple assignments, broaden the scope of reading and learning, promote self-learning, encourage and enhance peer learning, and improve students' exam preparation. It was suggested that tertiary institutions in Nigeria, particularly Polytechnics, establish a digital library where students can easily access scientific journals from databases such as Elsevier, Springer, Taylor & Francis, Wiley, and Emerald. This will lessen their reliance on Google and Google Scholar while also allowing them to explore other related scientific papers, improving their educational research and learning.

**Keywords:** Internet Access, Internet Facilities, Digital Library, Polytechnics, Nigerian Students, Research and Learning.

## I. INTRODUCTION

The Internet "is not a single technology; rather, it is an assemblage of various technologies that work in tandem" Turcu, (2018). The International Telecommunications Union offers a more formal definition: "enabling advanced services by interconnecting (physical and virtual) things using existing and evolving interoperable information and communication technologies." Wortmann, (2015). More specifically, According to Chou (2001), the internet has facilitated in improving how people seek information, conduct research, and conduct commercial transactions, Particularly, previous research has shown that the internet is now an absolutely vital component of the educational system for both students and lecturers (Rüzgar, 2005). It has been considered to be a great tool in this study with easy access to pertinent information, and it is progressively used by tertiary education students (Bond, fever, & Pitt, 2006). This backs up a recent study finding that internet use has become an essential element of all students' lives (Deniz&Geyik, 2015).

As a result, there are four essential characteristics for a device to be considered in the context of the Internet. [1. The device must be capable of collecting and transmitting data: internet devices must be able to collect data and send it to other devices that are direct on the Internet. 2. The device must be able to respond to actions: internet devices can be programmed to respond to specific conditions. 3. The device must be able to receive

data from the network: Internet devices must be able to receive data from the network. 4. The device must be capable of communicating. [Elkhodr, Shahrestani, Cheung, (2013)]. By definition, Internet devices are part of a network of devices that can communicate with one another via other nodes in the same network.

There is an indication that the early history of internet of things devices has long been related to higher education because the internet is a useful tool to facilitate educational tasks. over the years. As a result, its incorporation into polytechnics has been demonstrated to improve E-publications and provide access to information and communication technology. John, Fagbe, and Egbeyemi (2018). The use of internet resources for teaching, learning, and educational purposes has grown rapidly, and many institutions of higher learning now want to incorporate these technologies into their teachers' learning environments. It has become prevalent to see web pages containing course documents and other key information. material that supplements traditional classroom courses. Ko, & Rossen, (2017). It has been observed that internet resources has become a part of students' lives and a tool that is used for more than just delivering lectures, sharing ideas, and communicating with one another, but also for retrieving information about studies, conferences, seminars, projects, and other academic activities.

Todd (2008) finds that students prefer to use the internet to complete schoolwork due to the benefits of doing so in terms of completing a good research project and homework. Undoubtedly, the latest advancement of the internet and its resources has completely changed the academic setting. As a result, to take advantage of the vast resources available on the internet, a student must possess a moderate level of technological literacy, Communications technology literacy has been defined as a comprehensive knowledge of how and when certain needed data is required, where to obtain it, and how to evaluate and apply it to achieve specific goals. Apuke,(2020). This shows that information and communication technology extends beyond simply investigating and reviewing online sources to actually using them, thereby generating information and exchanging ideas (Todd, 2008).

### Statement of Problem

The internet is observed by way of cutting-edge technology with both positive and negative implications. In a negative dimension, the positive aspects of recent technology may be dissatisfactory. For example, the internet as a tool

for message delivery had also transformed the way society interacted in society, bringing in new methods of providing lectures and making everything so much easier. However, extensive research evidence confirms that the rapid development of information technology and the growth of the internet have had no impact on students' approaches to research and learning in technologically dynamic educational settings, which include both graduate and undergraduate students.

Lack of proper use of the Internet for educational purposes such as Virtual communications, sourcing, and sharing of research discoveries, this has transformed higher educational training while also improving educational growth and research has been abused by students for learning purposes.

In recent years, the internet is an integral part of today's educational system, and most institutions oppose the use of new technological devices for educational purposes. It has also been observed that many educational institutions now provide internet access to their students, instructors, and researchers but not utilized in a proper way.

It has been observed this day and age of technological advancement, Participants at institutions of higher learning are expected to be computer literate and to use the internet to help them learn and research however used it in different ways such as Facebook, Instagram etc.

The used of the internet which is meant for teaching, learning, besides research in polytechnics by the lectures and Students which absolutely executed in a wrong ways.

### Research Objectives

The main objective of the research is to assess the impact of the Internet as a learning resource Among students at some selected Polytechnics in Northeast Nigeria. As a result, the following goals will guide this work:

1. To find out the students' availability and experience to internet resources for educational research and learning among students of Polytechnic in north east Nigeria.
2. To establish the students' impacts of retrieving and engaging of digital resources in their research and learning among students of Polytechnics in north east Nigeria.
3. To determine the search engines and technological catalog frequently consulted for research and learning among the students of polytechnics in north east Nigeria.

4. To determine the challenges faced by students as regards the access and application of internet resources for research and learning among students of polytechnics in north east Nigeria.

#### **Research Questions**

The following are some of the research questions of the study are:

1. What is the availability and experience to internet resources for educational research and learning among students of Polytechnic in north east Nigeria.
2. What is the impacts of retrieving and engaging of digital resources in their research and learning among students of Polytechnics in north east Nigeria?.
3. How does realization of search engines and technological catalog frequently consulted for research and learning among the students of polytechnics in north east Nigeria?.
4. What are the challenges faced by students as regards the access and application of internet resources for research and learning among students of polytechnics in north east Nigeria.

## **II. BRIEF LITERATURE REVIEW**

### **Brief History of the Internet of Things**

Kevin Ashton invented the phrase "Internet" in 1999 while working on a standard for tagging objects with RFID for logistics applications. The concept of pervasive computing, on the other hand, dates back to the late 1980s. Researchers have since worked on a variety of systems, including tags and sensor networks, middleware and cloud technologies, and communication networks. When the Internet Engineering Task Force released IPv6, the protocol that enables the internet, it marked a significant milestone. Commercial engagement and work on reference architectures driven by major industries have recently boosted the internet. Weyrich, & Ebert, (2015).

Devices for machine-to-machine (M2M) communication standards such as Bluetooth, ZigBee, IPC Global's standards, and low-power Wi-Fi are commercially available from Google as Brillo, an OS for IoT devices in smart homes. Microsoft has announced that Windows 10 will include support for embedded systems for popular microcontrollers like the Raspberry Pi2 Samsung and other companies have unveiled a new generation of smart device chips. Many implementation reports have described networked microcontrollers acting as sensors, actuators, and tagging hubs. The Internet is also known as the

Industrial Internet resources in North America and Industry 4.0 in Europe. However, the Internet appears to be the preferred name. Lee, (2019).

### **The Internet and Higher Education**

Raiwani, (2013). which has been gaining ground, and advancements in telecommunications such as broadband expansion, the new IP protocol version 6, and nanotechnology integrated into countless electronic devices ranging from mobile devices, vehicles, appliances, and more. The idea behind the Internet of Objects is to integrate all of these devices into a network that can be managed from the web and, as a result, provide real-time information (we can know their status and features online) while also allowing interaction with people who use it. Education, like any other human activity nowadays, has been affected by this phenomenon, which began with e-learning and m-learning. Gómez, Huete, Hoyos, Perez, and Grigori (2013). Guinard, and Trifa (2009). Finally, the leap to general knowledge. Increased access to learning content and collaborative learning environments supported by computers at any time and from any location demonstrates the potential of ubiquitous learning. It also enables the optimal blend of virtual and physical spaces. Universal computing technology's primary goal is to improve learning processes. It is attempting to adapt learning resources for use by apprentices in a variety of contexts. Being in this area where the internet of objects plays an important role in formal and informal learning processes.

Students prefer to use the internet for school activities but they see the benefits in terms of completing a good research project and assignments. Indeed, the internet's recent evolution and manpower have completely transformed the academic environment Levin, and Arafah, (2002). As a result, to take advantage of the vast A student must have a reasonable level of technological literacy to access the resources available on the internet. Technological literacy has been defined as having a thorough understanding of when and why specified information is required, where to obtain it, and how to utilize it in specific situations. achieve specific goals. Bawden (2001). This demonstrates that technological literacy extends beyond searching for and evaluating information on the internet.

Ivwithghweta and Igere (2014) explore the impact of the internet on student's academic achievement at a few Nigerian tertiary institutions. A survey research approach was used, and a questionnaire was used to collect data. The study received responses from 5000 students. The study

results revealed that the majority of respondents were internet savvy and used the internet, It was established that students frequently use Cyber Café to access the internet and retrieve academic research materials such as E-journals and E-books. The understudies both stated that the internet helps them prepare for their exams better. Nonetheless, it was discovered that some of the issues confronting students' effective internet access and usage include power outages, slow internet high speed, inadequate computers, and a relatively small number of client computers.

### III. RESEARCH METHODOLOGY

This study has employed a survey method with use of questionnaire as the tool, for data collection given to a group of students choosing randomly.

#### Research Location

The study will focus on the six (6) Polytechnics from northeast geopolitical zone,

which include Federal Polytechnic, Damaturu, Federal Poltechnic, Bauchi, Ramat Polytechnic Maiduguri, Federal Polytechnic, Kaltungo , Federal Polytechnic Balli, and Federal Polytechnic Mubi.

#### Research approach

A stratified random sampling technique employed for the research According to Williams (2007). Stratified random sampling is a type of probability sampling. To stratify and divide people into groups based on characteristics such as position, rank, income, education, gender, or ethnic background.

In addition, the Statistical Technical Team (2019) recommended a sample size of 25% to 45 % for populations less than 2000. The researchers decided on a sample size of 25% to ensure adequate population representation for acceptable generalization. Using the simple random sampling technique, the researcher select students at random from all of the institutions involved in the study. Table 2 shows the sample for the study.

**Table 2: Sample Distribution**

S/N	Name of Institutions	State	Total
1	State Mubi Polytechnic	Adamawa	75
2	Ramat Polytechnic	Borno	70
3	Fed Poly Damaturu	Yobe	65
4	Fed. Polytechnic. Balli	Taraba	55
5	Federal Polytechnic. Kaltungo	Gombe	65
5	Federal. Polytechnic Bauchi State	Bauchi	70

**Total** **400**

#### Methods of Data Collection

For data collection, the researchers send a letter to the institutions under study, with six (6) research assistants would work together to ensure that questionnaires reach the targeted students at each polytechnic. The researchers and research assistants would then use structured questionnaires to collect data; the exercise will last for eight weeks to allowed the researchers and research assistants to overcome the challenges encountered while carrying out the research for data collection; some of the expected challenges include fear of Boko Haram attack, Knappers, weather problem, attainment trust from Students to give out sensitive information, absence of respondents in the school from which the data would be collected.

#### Instrument of Data Collection

This study's data collection instrument will be the questionnaire. Researchers and research assistants will self-administer the questionnaire to respondents. It is divided into five sections:

Demographic characteristics of respondents; Students' perceptions of the accessibility and use of the Internet resources for academic research and learning. The significantly positive impact of retrieving and using electronic information resources on students' research and learning; Search applications and scientific publications databases that students frequently consult for research and learning; as well as the challenges they face in accessing and applying some internet resources in teaching and learning;. In addition, the questionnaire included both closed and open-ended questions. This will be conducted to gain a thorough understanding of the students' perspectives. The question in the questionnaires was adapted from previous research. Sharma, Vasudev, andy, &Hande, (2006); Willetts, Sampson, L., Browne, Stampfer. (1988).

#### Data Analysis Methodology:

The researcher use frequency distribution table as a score method, the analysis involved the use of values allocated to the 5-point likert scale rating. To answer research questions one, two, three, and four, descriptive statistics will be used. Pearson Product Moment Correlation (PPMC) will be used in the testing of null hypotheses one, two, three, and four. This is based on Briggs' decision (2019). Who proposed using correlation to assess the relationship, influence, or effect of independent variables on dependent variables? All null hypotheses will be tested at the 0.05 level of significance, which will aid in the analysis of the

data for the questionnaire controlled and the drawing of conclusions.

#### IV. DATA PRESENTATION AND ANALYSIS

The researchers uses four hundred (n=400) questionnaires distributed randomly across institutions, three hundred and eighty (n=380) was found useable, due to the fact that some questionnaires were not completely filled rendering it useless. Nevertheless, the return rate is 85.5%, which is an acceptable rate. Thus, the analysis would be carried out base on the returned number of questionnaires.

#### Demography of respondents Students Record

Survey	Reactions	Frequency	Percentage
What is gender ?	Male	250	68.2%
	Female	130	31.8%
What is your age ?	16-20	90	19.2%
	21-24	200	58.0%
	26-30	60	15.8%
	30 and above	30	7.0%
What is your Marital Status ?	Marriage	80	15.1%
	Single	280	81.4%
	Divorce	20	3.5%
What is your Department ?	Department of OTM	40	10.7%
	Department of Science Lab Tech.	100	26.5%
	Department of Survey and Geo-infor.	80	22.9%
	Department of Marketing	50	12.6%
	Department of Accountancy	60	14.7%
	Department of Banking & Finance	50	12.6%
What level are you ?	HND I	80	22.9%
	HND II	50	14.8%
	ND I	130	31.6%
	ND II	120	30.7%
Total		380	100%

Source: Field survey, 2023

Table 4.1 above shows the student's record that there were more Male (68.2%) students than Female (31.8%). In terms of age, more than half of the students (58.0%) reported to be within the ages of 21-24. Further results from the sample showed there were more single students (81.4%) than married students (15.1%), and this could be due to the fact that the sample is undergraduate students. Six departments that participated in the assessment, department of science laboratory technology students participated more (26.5%) than

any other departments, and this could be due to the fact that they have more students than any other departments in the institution.

#### The students' accessibility and exposure to internet resources for academic research and learning.

As shown in Figure 4.1, the researchers investigated if the respondents have access to internet facilities. Based on the results, it was ascertained that a large number of the respondents



(n=310) 91% disagree that they don't have access to internet facilities. While, only a few 70 (9%) stated they have access to internet. In this regard,

the next section investigated the extent of the students' access to internet services and resources.

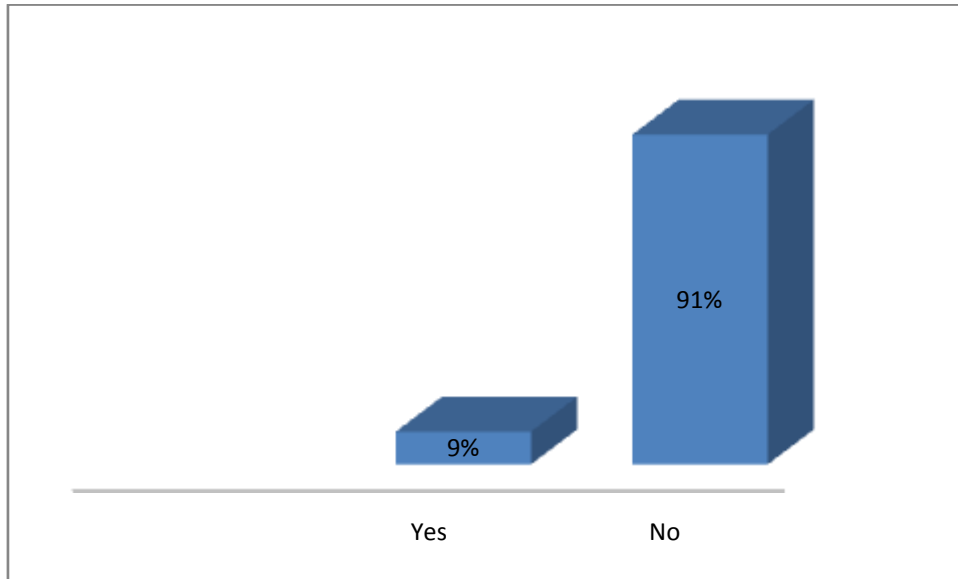


Figure 4.1 Access to Internet

Findings in Figure 4.2 show that a large proportion of the students (n=200) 58.0% reported that to some extent they are exposed to the internet

facilities, while (n=100) 31.0% alleged that they are exposed to the internet to a large extent.

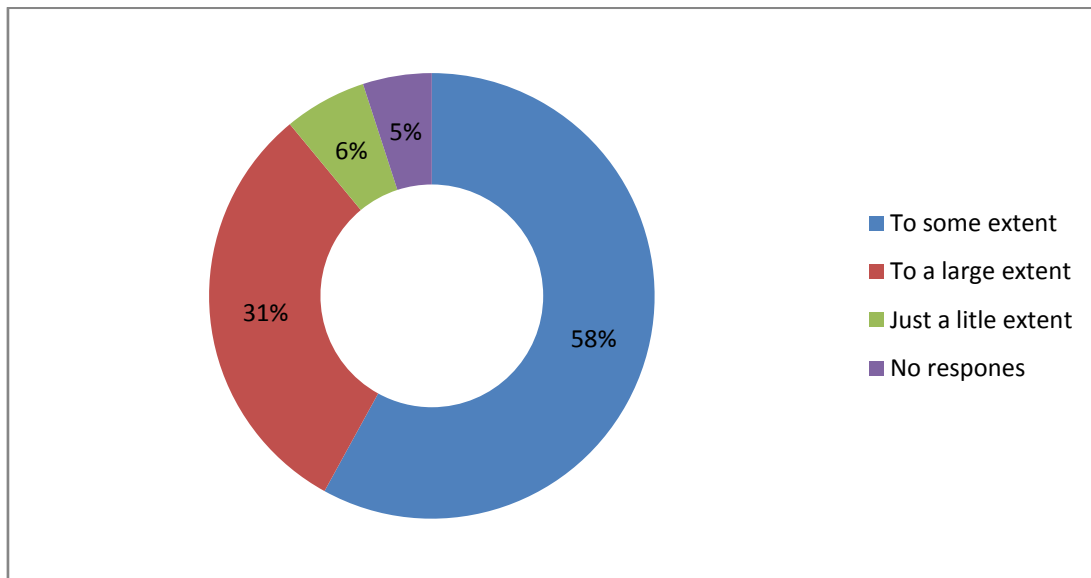


Figure 4.2: Extent to student exposure to the internet facilities.

On the other hand, (n=50) 6.5% maintained that they are exposed to the internet just a little extent and (n=30) 4.5% had no response to the question asked.

between 1 semester internet experience, this is followed by 27.6% who stated to have 1-2 semester internet experience, 12.2% had 3-4 semester internet experience, 4.2% said they have less than 2 semester experience and only 7.6% of the

The data (Figure 4.3) shows that aggregate number of the students 48.4% reported to have

respondents reported to have more than 4 semester experience.

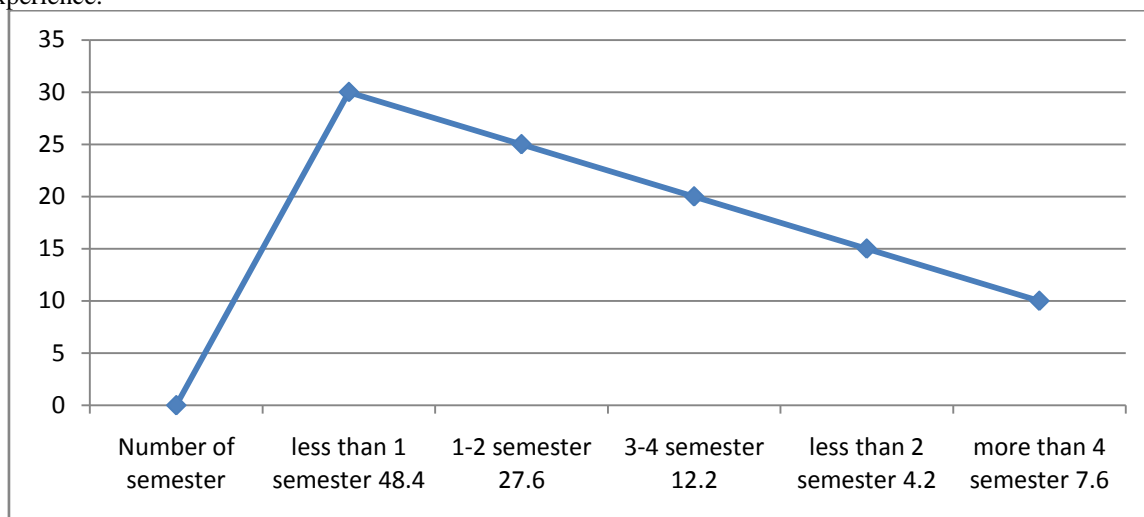


Figure 4. 3: semester respondents' internet experience.

In Figure 4.4, the researchers asked the respondent to state where they access the internet the most. This implies the position they frequently access and use the internet. As shown in Figure 4.4, most of the participants (59%) select and access the internet from their homes/dormitories, 24% of the

tested students alleged that they access and choose to use the internet in the school premises, whereas 10% choose to access the internet more frequently from cafés in the school/town and only 7% of the sampled students stated that they mostly access and use the internet in the library.

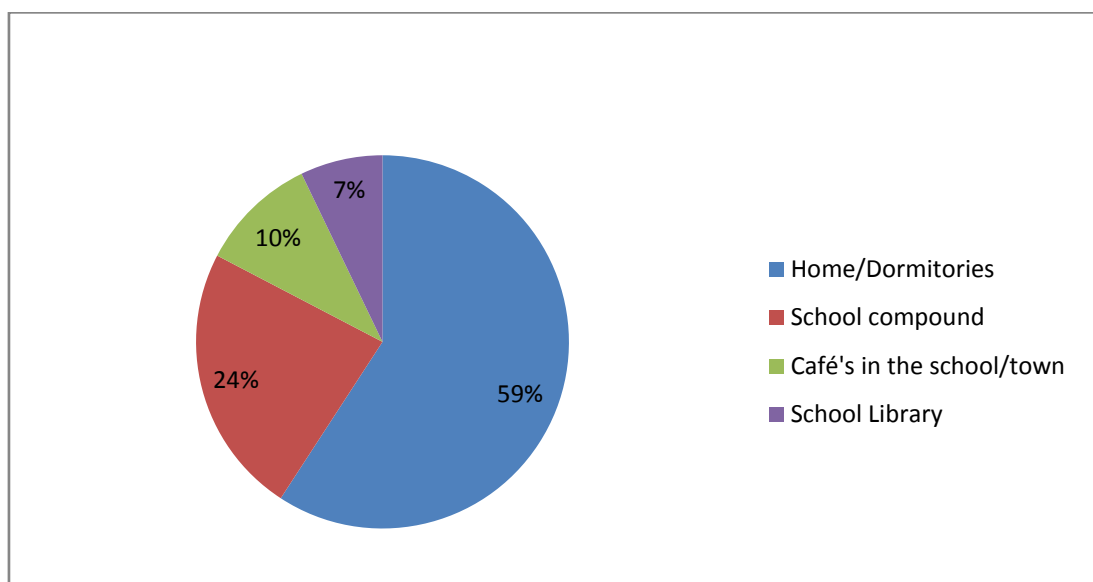


Figure 4. 4: Students preferred internet access point

It is clear that the students have many points of accessing the internet; however, most of them choose to access it from home and residences. This suggests the institution do not provide adequate avenue for the students to get expose to internet facilities and catalogue so as to improve their research and learning.

Furthermore, the researchers pursue from the students the medium and a tool in which they choose to access the internet. In this study, the medium refers to the gadgets or tools that help them in accessing the internet. According to the data in Figure 4.5, the majority of the students (65%) choose to use their mobile/smartphones as a

medium for accessing the internet services. 21% said they prefer to use their Tablet, while only 14%

stated Laptop.

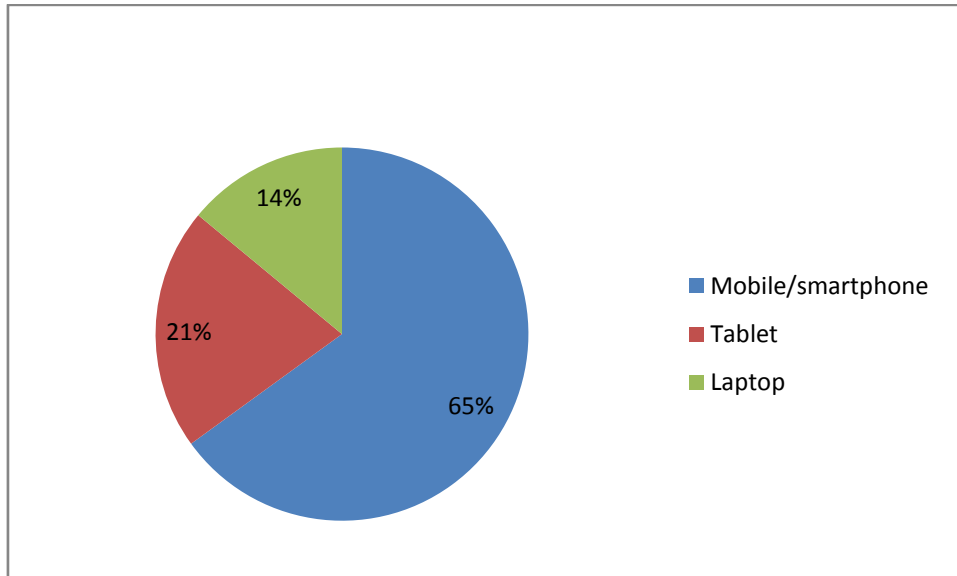


Figure 4. 5: The medium students use to access the internet.

As validated in Figure 4.6 the researchers asked the students the average time, they spend on the internet which could either be less than 30 minutes, 30 minutes to 1 hour, 1-2 hours, 2-3 hours or 3 hours and above. Results obtained showed that a high percentage of the students that is 71.4% claim that when they make use of the internet, they use it for more than three hours. 20% said when

they make use of the internet, they use it for about two-three hours, 8.6% of the students said when they make use of the internet; they use it for one-two hours. Overall, it can be inferred that when the students make use of the internet, they use it for more than three hours which shows a considerable rate of internet usage.

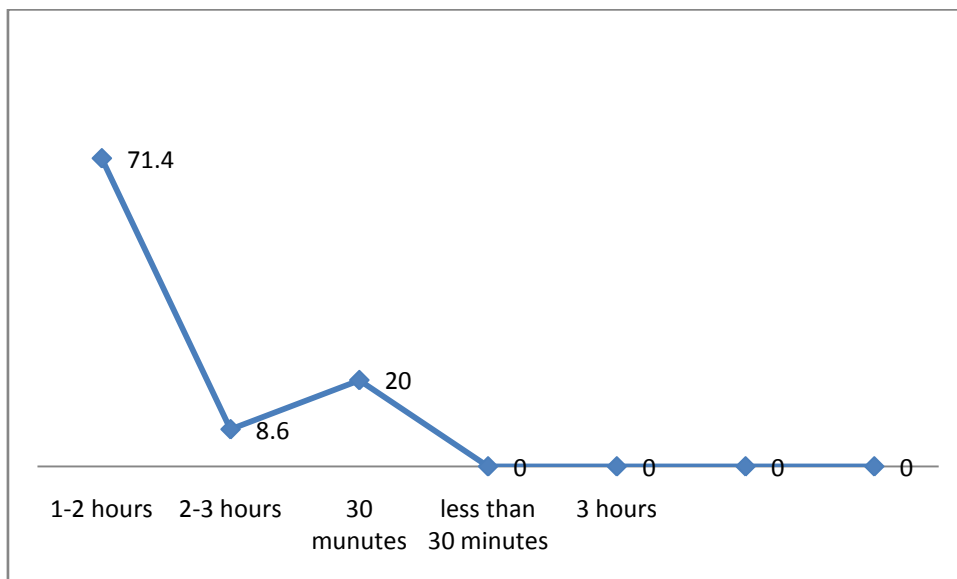


Figure 4. 6: Average time spent on the internet.

**Perceived benefits of adopting electronic resources on the students' research and learning**

As shown in Table 4.2, the students were asked based on a Likert scale if they make use of



the internet for academic purposes. Results determine that a large portion that is 230 making 58.6% strongly agreed that they make use of the internet for academic purpose. This was supported by 110 participants making 30% who agreed that they make use of the internet for academic

purposes. Only few 20 making 5.7% and another 20 making 5.7% disagreed and remained undecided respectively. Based on these results, it could be said that an overwhelming number of the students make use of the internet for academic purposes.

**You make use of the internet for academic purpose.**

Response	Frequency	Percentage (%)
Strongly Agreed	230	58.6%
Agreed	110	30%
Strongly Disagreed	0	0
Disagreed	20	5.7%
Undecided	20	5.7%
<b>Total</b>	<b>380</b>	<b>100%</b>

Aside using the internet for academic purpose, the students were asked to state other things they do with the internet. This was an open-ended question that allowed the students to comment on other activities they do with the internet. It was found that a large number of the students (80%) remarked that they use the internet for entertainment and communicating with friends and family. While others claim that they use the internet to search for general information that improves their well-being. This implies that entertainment and communication is among the

most welcomed activities carried out by the respondents. Nevertheless, they maintained that internet use for their educational purposes is also paramount.

As demonstrated in Table 4.3, the researchers inquired from the students if the use of the internet has impacted their research and learning. A Likert scale was used to ascertain the degree of acceptance as regards the internet resources impact on the students' research and learning.

**Internet usage has improved your research and learning.**

Response	Frequency	Percentage (%)
Strongly Agreed	240	61.6%
Agreed	100	27.0%
Strongly Disagreed	20	5.7%
Disagreed	20	5.7%
Undecided	0	0
<b>Total</b>	<b>380</b>	<b>100%</b>

The results from Table 4.3 showed that 240 participants making 61.6% strongly agreed that the use of internet has improved their research and learning. This claim is also supported by 100 other participants' making 27.0% who agreed that the use of internet has improved their research and learning. On the contrary, a exact slight number 20 making 5.7% of the participants strongly disagreed that the internet has improved their research and learning. Additionally, 20 other participants making 5.7% also disagreed that the internet has

improved their research and learning. In general, these results have shown that the utilization of the internet has improved the learning and research of the students. The subsequent questions will demonstrate the areas in which the internet has improved the students overall learning and research.

Furthermore, as illustrated in Table 4.4, the researchers inquired from the students, their perceived benefits as regards to the impact of internet.

**Highlight the benefits of the use of internet resources.**

Response	Frequency	Percentage (%)
Eases research and learning process	210	56.3%
Availability of prior and recent valuable literature	42	11.1%
Improves quality of research	60	13.7%
Easy retrieval of credible information	30	7.9%
Undecided	38	11.0%
<b>Total</b>	<b>380</b>	<b>100%</b>

It could be seen that the students highlighted various benefits derived from the use of internet, however, most of them 210 amounting to 56.3% believe that the use of internet eases research and learning which implies that it simplifies research and learning. This ranking is followed by 42 making 11.0% of the participants who remarked that the use of internet improves the quality of research, 60 making 13.7% agreed that the internet provides prior and recent valuable literature, this is supported by 30 other participants making 7.9% who asserted that the internet provides easy retrieval of credible information. While 38 other participants making 11.0% remained undecided. This is not surprising as

shown in Table 4.3 a collective number of 40 students debunked that internet do not improve their academics.

To further understand how the internet, improved the students' academic research and learning, table 4.5 was computed and the researchers inquired from the student to specify how the impact of the internet has improved their research and learning. The students pointed out to the different ways the internet has improved their learning and top on this list as highlight by 150 making 42.9% of the participants' is that the internet usage has assisted them to undertake their project/research in good time.

**How the internet has helped the students learning and research**

Response	Frequency	Percentage (%)
It assists me in carrying out substantive and scientific project/research ahead of time	200	55.0%
It helps me prepare better for examination	52	12.0%
It helps me attain wider understanding and knowledge of what is taught in class.	60	14.7%
It aids me to prepare better for class presentation	33	7.9%
No response	40	10.4%
<b>Total</b>	<b>380</b>	<b>100%</b>

This ranking is followed by 200 making 56.3% who claimed that the used of internet assists students in carrying out substantive and scientific project/research ahead of time and 52 making 12.0% of the respondents who claimed that the use of the internet helps them prepare better for examination, while 60 making 14.7% alleged that the use of internet has helped them attain wider understanding and knowledge on what is taught in their classroom. This notion is supported by another 33 making 7.9% of the respondents' who stated that the use of the internet helps them prepare better for class presentation. While 40 making 11.4% had no

response to the question. Overall, it could be said that the use of internet is indeed improving these students' academic research and learning in various ways.

**V. CONCLUSION AND RECOMMENDATIONS**

**Conclusion**

This study's findings show how Northeastern Polytechnics students use the internet for educational research and learning. Overall, it can be inferred that the use of the internet assists students in completing research on time, in getting better prepared for class presentations, in

comparing different materials that support their homework and class assignments, in inspiring self and peer learning, in achieving a broader understanding and knowledge of what is taught in class, and in assisting them. carry out substantive and scientific project/research ahead of time, as well as assist them in exam preparation. Furthermore, it has been demonstrated that northeastern polytechnic students access the internet primarily through their mobile phones. Furthermore, their educational institutions do not provide adequate internet access. Their frequent access and usage is sometimes discouraged by the issue of slow and inconsistent internet connectivity. According to the findings of the study, the internet is a valuable tool for improving educational research and performance. Despite the fact that students obtained academic materials via mobile phones and cafes, it is concluded that students make adequate use of the internet for their academic activities. The internet also improves the learning process by improving academic performance, advancing research knowledge, critical thinking, promoting self and collective learning, encouraging study motivation, developing self-confidence, and improving overall teaching methods. The same study concludes that the internet facilitates information retrieval and provides knowledge more frequently and beneficially than traditional teaching, thus complementing formal learning.

Although students use a variety of search engines, Google and Google Scholar are the most popular and widely used. According to the students, the reasons for using these catalogs are that it contains credible, scholarly information that is carefully organized and easily accessible, and it contains the majority of the Institute for Scientific Information (ISI) web of knowledge papers.

### Recommendations

This study revealed that the students seem to do well with the help of their smartphone, as well as a laptop and modem to access the internet facilities such as email, internet search engines (Google and Google Scholar) and communication platforms, despite the inefficient provision of internet facilities on their campuses. Yet, there are challenges raised by the students that require attention. Thus, this study proposes the following suggestions to improve internet access and usage for educational research and learning in the studied area.

1. Tertiary institutions, particularly all Federal polytechnics in the northeast, should have an efficient cybercafé, as well as internet access and a

digital technological catalog. This will expand access beyond smartphones and the use of open access resources such as e-journals, e-conferences, e-thesis and dissertations.

2. The sampled institution requires an electronic library where students can easily access scientific and technological journals from databases like Elsevier, Springer, Taylor & Francis, Wiley, and Emerald. This will lessen their reliance on Google and Google Scholar while also allowing them to explore other related scientific papers, improving their educational research and learning.

3. Network providers such as MTN, Glo, Etisalat, and Airtel Telecommunications Company, as well as their collaborators, should prioritize network improvements and tariff reductions to allow students to purchase data at a reasonable price. This will encourage researchers to download research materials more quickly and easily.

4. To encourage internet access for academic purposes, the irregularity of power supply in the sampled polytechnics campus should be improved. This will reduce the students' mobile and laptop devices running out of power/battery, which frequently interrupts their internet use. When this issue is resolved, it will benefit their educational research and learning in general.

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