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Internet Usage for Research and Learning Among University Students in Nigeria

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Abstract

This paper attempts to research into the challenges facing the students in this region as it relates to internet usage for academic research and learning and how they find ways to make use of the internet to facilitate their studies. It also examined the benefits they derive from the usage of internet. The participants were tested through a mixed-method design. Firstly, ($n=250$) participants' answered questionnaires. Then, ($n=18$) class representatives were invited to a focus group discussion. The findings identified the lack of digital readiness among their institution, the absence of electronic library for easy accessibility to journals from the scientific database, inefficient cybercafé and internet facility within their university settings as the main issues discouraging the usage of the internet within their institutions. Yet, they still find ways to make use of the internet to facilitate their studies through smartphone/handsets. Intrinsically, the students believed that the use of internet enabled them to perform research ahead of time, tackle multiple homework, widens the scope of reading and learning, promotes self-learning, encourages and enhances peer learning as well as ameliorates student's examination preparation.

Keywords: Challenges in internet access, Internet, Northeastern Nigeria, research and learning, University students.

1. Introduction and Background

The internet has been defined as the communication superhighway that links, hooks, and transforms the entire world into a global village where a different individual can easily get in touch, see, or speak to one another, as well as exchange information instantaneously from one point of the globe to another (Shitta, 2002). This technology has reshaped the tertiary educational practice in terms of improving academic learning (Apuke & Iyendo, 2017; Manasijević et al., 2016) and will be more feasible in the future. Hussain (2012) reported that the internet and its usage in higher education have improved educational development and research and has encouraged virtual interactions for sharing research findings.

Like in any other higher institution of learning around the globe, Nigerian university undergraduate students are often required to conduct diverse research work as they progress through their final year. The qualities of a student's research and learning are largely dependent on the quality, quantity and current internet resources referred to (Ilo & Ifijeh, 2010). This has attracted research debate on the use of internet in contemporary educational contexts in developing countries such as Nigeria. However, most of these studies predominantly highlight its impact on academic performance (grades), communication, and general educational purposes (Briz-Ponce et al., 2017; Adegboji & Toyo, 2006; Oduwale, 2004). This indicates that detailed studies that try to interpret student perspective on internet access and usefulness for research and academic learning are still in their embryonic phase (Emeka & Nyeche, 2016; Fasae & Adegbilero-Iwari, 2015; Adekunmisi et al., 2013; Nwezeh, 2010). It is worthwhile to mention that most of these documented researches based merely on students within Southern, Eastern and Western region (Otunla, 2013; Agboola, 2010; Ani, 2010; Adogbeji & Akporhonor, 2005). This strong focus has led to a limited research conducted among students' in the North-Eastern part which is amid slower technological change (Ahmed & Bukar, 2016; Emeka & Nyeche, 2016).

Though, there is evidence to show that a limited proportion of the population has access to the Internet at home, yet, little is known if students in this region incorporate this technology into their research and learning (Navaretti & Tarr, 2017; Hartnett and Russell, 2002). Poushter (2016) observed that technological development in universities within this region is not much advanced and very little research in the implementation of information and communication technology (ICT) has been undertaken as compared to research in universities in other regions

of Nigeria. This backdrop provides a scope for an in-depth research into the students' experience and perspective on the access and utility of electronic sources for academic research and learning. Thus, it is pertinent to research into how these students find ways to make use of the internet to facilitate their academic research and learning. This also calls for exploring the challenges facing the students in this region as it relates to internet usage for academic research and learning.

To the best of our knowledge, this paper is one of the first to attempt to research in detail the challenges facing the students in the North eastern region of Nigeria as it relates to their internet usage for academic research and learning and how they find ways to make use of the internet to facilitate their studies. As well as the perceived benefits they derive from the utilization of the internet for their studies. This offers an insight to administrators and educators into the internet utilization by a section of students that is not often studied. It therefore has a potential for a relevant contribution to the literature on internet adoption for educational purposes. It is believed that the outcomes of this current study will contribute to enhancing the empirical research results that are beneficial for informing teaching and learning practice in higher education. This paper was structured into five (5) main sections describing the 'introduction and background of the study'; 'review of related literature'; 'methods', 'data analysis and results'; and lastly 'discussion and conclusion.'

2. Review of Related Literature

Research evidence has shown that the advances in information technology and the development of computers have affected student approaches to research and learning in the contemporary higher educational settings. Several studies have supported that the internet utilization is most prevalent among younger, educated individuals (Poushter et al., 2015; Hoffman et al., 2000). For example, Ivwighreghweta and Igere (2014) investigated the impact of the internet on academic performance in selected tertiary institutions and found that most of the students were computer literate and merely access relevant academic materials through the Cyber Café. Most of the students disclosed that the internet usage improves their examination preparation. E-journals and e-books were among the resources often used. However, power outage, slow internet speed, lack of computer terminals, too many hits or information overload and insufficient computer were some of the problems impeding effective internet access or usage.

Ahmed and Bukar (2016) found that majority of the students who utilize the internet for educational and entertainment purposes depended on their mobile devices for internet access. Similarly, Fasae and Adegbilero-Iwari (2015) discovered that science students who regularly access the internet facilities on their smartphones, such as e-mails, social media and search engines, utilize it for educational and communication functions. However, poor internet connectivity and the high cost of data subscription were identified to be the major challenges confronting the students. According to Agboola (2010), there is a high level of mobile device dependency for internet access among agricultural science students in Nigeria. The same survey found that most of the students who utilize the internet for educational and entertainment purposes prefer to use textbooks among print materials and the essential electronic agricultural library (TEEAL) among the electronic resources. Ogunla (2013) reported that a considerable number of undergraduate students accessed and use the internet through their mobile telephones and laptops using a modem as a router, whereas a few accessed the internet through the University digital centre and none accessed through the University Library. It was likewise shown that the internet made data retrieval easier, resulting in a positive impact on a student's educational development. Selwyn and Gorard (2016) comment that students now utilize Wikipedia as it offers basic information, initial orientation and occasional clarification on certain topics, although it has limited importance compared to library resources such as e-books, learning management systems, lecture transcriptions and academic literature databases. Bashir et al. (2016) revealed that most students use the internet for course-related reading and research needs, due to its user-friendliness and time-saving. They also found Google and Yahoo to be the primary search engine used by the students. Adekunmisi et al. (2013) discovered that most of the students at Olabisi Onabanjo University use the internet facilities, such as e-mails, web pages and search engines for chatting and academic activities.

A recent survey found performance expectancy (PE), and effort expectancy (EE) to be the strongest determinant that encourages the adoption and use of eLearning amongst students in Nigeria (Yakubu & Dasuki, 2019). In line with this, research evidence has shown that the Internet contributes to teaching, learning, research and access to information sources in academic institutions (Fasae & Adegbilero-Iwari, 2015; Adekunmisi et al., 2013; Nwezeh 2010; Kumar & Kaur, 2006). Nwezeh's (2010) indicated that most of the academic staff and students in Obafemi Awolowo University found the use of email and Web worthwhile for research and information retrieval. A similar empirical evidence proposed that the use of e-mail for academic-related activities should be encouraged

among students in order to harness its full potential in improving academic performance (Nketiah-Amponsah et al., 2017). Similarly, Sampath Kumar and Manjunath (2013) noted that the utilization of the internet supported the study and teaching of teachers and researchers, which in turn enhanced their academic performance, research skills and learning.

Evidence has proven that students depend on the Internet when they seek information that support them in doing their assignments and other academic work (Desta et al., 2017; Moly, 2014). Although some students do have access to the internet, yet they are still confronted with the issues of bandwidth, slow internet connections (Moly, 2014), inadequate network computers, inadequate opening hours of computer research labs, a lack of access to printers in the library and a limited number of computers in the internet laboratories (Okello-Obura & Magara, 2008). Research also found that limited access to the internet on campus affected the information seeking behaviour of distant learners at Lesotho National Universities (Boadi & Letsolo, 2004). Similarly, lack of ICT infrastructure, frequent interruptions in the electricity supply, and old computers proved to be the main factors affecting postgraduate information-seeking behaviour at the University of South Africa (Desta et al., 2017). Emeka and Nyeche (2016) reported that the employment of the internet enhanced the skill and capacity of students. Though, lack of computer skills, slow internet server and the problem of paying for online were found to be some of the problems encountered in the use of the internet.

Prior study has proven that the internet enables students to access relevant and up to date materials for their research work without travelling to other places to source for research materials (Adogbeji & Akporhonor, 2005). Oduwole (2004) argues that the internet has a great impact on the research outcomes of students, as this enables them to have fast communication with their schoolmates, as well as offer a platform for accessing and publishing papers online. Other evident studies reported that the internet contributed significantly to the easiness of research through downloading materials (Adegboji & Toyo, 2006), as well as enhanced the cognitive operation of data dissemination (Kamba, 2008). In contrast, Ureigho et al.'s (2006) study on the impact of the internet on learning, teaching and research in higher institutions found that students and staff use the internet primarily for online chatting and e-mailing, rather than accessing research materials. Generally, a growing body of studies has established that students extensively use the internet for their research work (Ani, 2010), and this has progressively improved students' academic performance (Ogedebe, 2012).

As demonstrated in the studies reviewed thus far, there is evidence to show that the use of internet in the educational settings has attracted a growing body of research in the Nigerian context and beyond, yet, there has been very limited research conducted among students in the Northeastern part of Nigeria. It is worthwhile to note that, in this region, technological development in Universities is not much advanced and very little research has been carried out to show the implementation of ICT as compared to Universities in other parts of Nigeria. Thus, there is the need for a study to investigate how students in this region find ways to make use of the internet to facilitate their studies. As such, this study responds to this call for more research, by investigating the challenges facing the students in the North eastern region of Nigeria as it relates to their internet usage for academic research and learning and how they find ways to make use of the internet to facilitate their studies. It also examined the perceived benefits they derive from the utilization of the internet for their studies. To achieve this aim, this study considers four (4) fundamental objectives:

- To determine the internet resources accessibility pattern among undergraduate students.
- To demonstrate the students perceived benefits from the use of internet resources for academic research and learning.
- To understand the search engines frequently used by the students for educational inquiry.
- To realize the challenges confronting the students regarding the use of the internet for educational research and learning.

3. Methods

3.1 Research Design

A sequential mixed research method strategy was used to gather up the information for this study. Sequential procedures began with a quantitative survey that consists of the use of questionnaires, followed by a qualitative approach (focus group discussion) to explore in detail a few cases or individuals (Braun & Clarke, 2006). Dual methods were used in this work because evidence has demonstrated that they get more data, explicate the issues

brought up, as well as provide an understanding of the underlying causes and judgments from a small or large group in a study (Adogbeji & Akporhonor, 2005).

3.2 Study area and sampling/selection procedure

3.2.1 Selection procedure for the quantitative survey participants

A total of 11 public universities exist in North – Eastern Nigeria. This includes Abubakar Tafawa Balewa University, Bauchi; Adamawa State University, Mubi; Bauchi State University, Gadau; Borno State University, Maiduguri; Federal University Gashua, Yobe State; Federal University Kashere, Gombe; Federal University, Wukari, Taraba State; Gombe State University, Gombe; Modibbo Adama University of Technology, Yola; Taraba State University, Janlingo; University of Maiduguri, Borno State; Yobe State University, Damaturu. Therefore, to select the institutions used in this study, the researchers applied a simple random sampling in a form of balloting technique. The institutions were selected through pick without replacement to include Taraba State University, Jalingo (TSU); Federal University Kashere, Gombe (FUK) and the Federal University Gashua, Yobe State (FUG). This work concentrates on the North Eastern geopolitical zone of Nigeria, because until today, there are only limited studies carried out in this part which is still witnessing slower technological change. Though a moderate proportion of the population has access to the Internet at home, little is known if students incorporate this technology into their inquiry and learning in their respective educational settings.

Only the final year students of the Faculty of Arts and Social/Management Sciences/Humanities where the targeted participants from the three universities, which comprised of around 1500 students (retrieved from the Registrar's office of the three Universities). This choice was because these faculties host the largest number of students in the selected universities. A proportional sampling of 20% of the survey population was used to define the total sample size of 300 students. The participants were randomly selected from the following departments: 'Languages and Linguistics'; 'Geography'; 'Political Sciences'; 'Sociology'; 'Mass Communication'; 'Public Administration'; 'Philosophy'; 'Theatre art, and History. The first to third-year students were excluded from this study because it is believed that students carry out their research projects in their final year. As such, only the final year students participated in this survey, because they have had a series of assignments such as classwork/homework as well as other research work from their first year to their final year and possess a fuller understanding of the rudiment and the challenges involved in the use of the internet for academic research and learning.

3.2.2 Selection procedure for the focus group participants

For the focus group participants, the authors purposefully selected a total number of 18 class representatives, six (6) each from the Faculty of Arts and Social Sciences/Humanities in the three selected universities (See Table 1). This choice was based merely on their long time of service (first to final year) and have arrived at a fuller understanding of the influence of accessing and utilizing of electronic resources for academic inquiry.

3.3 Procedure for data collection

3.3.1 Procedure for the quantitative (questionnaire) survey data collection

Three hundred (300) copies of structured questionnaires were randomly administered to the students in their lecture theatres with the authorization and assistance of their lecturers. Two research assistants were also employed to facilitate this process. The survey questions used in this study was developed by the authors. However, items were adopted from previous relevant studies (Ahmed & Bukar, 2016; Fasae & Adegbihero-Iwari, 2015; Apuke, 2016; Adekunmisi et al., 2013; Ani, 2010; Nwezeh, 2010; Kumar & Kaur, 2006) and modified to suit into this present investigation. This was done to ensure content validity (Chang & Tung, 2008). Additionally, the questions were further reviewed by six (6) experts, which include two each in the field of communication, educational technology, and computer sciences respectively. After thorough scrutiny of the questions in the questionnaire, the experts expunged irrelevant questions and further suggested questions that aid in answering the objectives raised in this investigation. Besides, a pilot study was conducted among 45 students with the purpose of measuring the reliability of the instrument.

The data were gathered within a period of 10 weeks during the 2018/2019 academic session. Hundred (100) copies of the questionnaire each were distributed to the three selected universities under investigation. Of the 300 copies of the distributed questionnaire, 250 were duly filled and returned, given a response rate of 83.3%. Overall, TSU had 90 (36%) more responses than FUK 86 (34.4%) and FUG 74 (29.6%). The questionnaire covers five

sections. Section I request the respondents to provide demographic information. Section II requests the internet resource accessibility pattern among the students. Section III captures the students perceived benefits from the use of internet resources for academic research and learning. Part IV looks at the search engines frequently used by the students for educational research. Section V requested the respondents to state the challenges confronting them regarding the use of the internet for educational research and learning. Sections I, II, IV questions were resented in category scales, and the respondents were requested to tick the appropriate boxes. On the other hand, Section III used the five levels of Likert Scale from 1-Strongly disagree through 5-Strongly agree. While Section V used the open-ended question style to understand the respondents' opinions/thoughts.

3.3.2 Procedure for the qualitative (focus group) data collection

Three (3) focus group discussions with six members in each group were held at the students' universities without the presence of the lecturers. After the researchers got consent from the three universities under investigation, each student in the focus group completed a consent form giving them the permission to participate in this study. The individual focus group discussion lasted for about 60-90 minutes to complete. The discussion was audio-recorded and transcribed manually. During these sessions, the first author took notes to have better and accurate results. The participants were assured of confidentiality and that only pseudonym, that is, a code would be used to represent individual students. For example, the code TSU 1 represent Student No. 1 from Taraba state university focus group, FUK 4 represent Student No. 4 Federal University Kashere, Gombe focus group and FUG 6 represent Student No. 6 from Federal University Gashua focus group session (Table 1).

Table 1. The focus group participants profile.

Institution (s)	Focus group code	Number of student/gender	Department/Discipline	Age Range
Taraba State University, Jalingo	TSU 1	6 in total (3 Male 3 Female)	Mass Communication	23-29
	TSU 2		History	
	TSU 3		Sociology	
	TSU 4		Political Sciences	
	TSU 5		Geography	
	TSU 6		'Languages and Linguistics	
Federal University Kashere, Gombe	FUK 1	6 in total (4 Male 2 Female)	History	23-29
	FUK 2		Public Administration	
	FUK 3		Geography	
	FUK 4		Political Sciences	
	FUK 5		Sociology'	
	FUK 6		Languages and Linguistics	
Federal University Gashua	FUG 1	6 in total (2 Male 4 Female)	History	23-29
	FUG 2		Mass Communication	
	FUG 3		Sociology	
	FUG 4		Political Sciences	
	FUG 5		Theatre art	
	FUG 6		'Languages and Linguistics'	
Total	18 participants	3 groups (9 male and 9 female Participants)		

4. Data Analysis and Results

4.1 Data analysis

The data generated from the survey (i.e. administered questionnaire) were analyzed using the statistical package for social science (SPSS version 25) software using descriptive and inferential statistics to include frequency counts, simple percentages presented in tables and graphs as well as T-test, Chi Square and Analysis of variance (ANOVA). In this study, the focus group responses were thematically analyzed. This comprised of organizing and categorizing responses into patterns to generate various themes (Braun & Clarke, 2006). Consistent with Krueger's (2002) notion, the focus group interviews were transcribed and the additional non-verbal behaviours identified during the discussion session were noted. This includes head nods, smiles, frowns, or signs of boredom and was aligned with the transcription where appropriate. Additionally, other notes such as student statements were written down to aid in drawing connections between the interviews and the research question. Rather than looking for differences, the analysis focused on identifying common and collective responses which were then categorized

and discussed thematically as it regards to students' perception and experience of using the internet for academic uses.

4.2 Participants profile

The survey results showed that of the 250 respondents, ($n=150$) 60% were female and ($n=100$) 40% were male. It likewise demonstrated that ($n=80$) 32% were married and ($n=170$) 68% were single. Furthermore, it was deduced that ($n=80$) 32% were between the ages of 16-22, ($n=140$) 56% were between the ages of 23-29 and only ($n=30$) 12% were 29 and above, indicating that most of the participants were between the ages of 23-29. The participants were from different discipline, such as Languages and Linguistics ($n=35$) 14%, 'Geography' ($n=30$) 12%, 'Political Sciences' ($n=30$) 12%, 'Sociology' ($n=20$) 8%, 'Mass Communication' ($n=40$) 16% 'Public Administration ($n=20$) 8% 'Philosophy' ($n=25$) 10% 'Theatre art ($n=30$) 12%, and History ($n=20$) 8%. Conversely, the focus group participant profile showed that ($n=9$) 50% were female and ($n=9$) 50% were male students with the age range of 23-29 (see Table 1).

4.3 Internet resources accessibility, and its perceived benefits for academic research and learning.

Table 2 is derived from the quantitative survey carried out among the 250 students to describe the responses of internet availability, utilization, and impact on student's academic research and learning. An analysis of variance showed no significant difference across the institutions with regards to the adequate access to internet facilities $F(2, 247) = 1.13, p > .5$. A large number of the students (62.8%) asserted that they have no adequate internet facilities in school. However, it was observed that TSU ($M = 1.66, SD = .475$) reported to have more internet facilities than FUK ($M = 1.56, SD = .498$) and FUG ($M = 1.66, SD = .476$). Furthermore, a significant difference was realized with regards to the usage of internet for academic purpose across the sampled institutions $F(2, 247) = 1.98, p < .5$. TSU students reported to use more internet for academic purpose ($M = .314, SD = .067$) than FUK ($M = .168, SD = .064$) and FUG ($M = .141, SD = .068$). Overall, a large portion of the students use internet for academic purpose (72.8%).

Table 2. Internet resources accessibility, and its perceived benefits for academic research and learning.

Item (questions)	Responses	Institutions			Total
		TSU	FUK	FUG	
Do you have adequate access to internet facilities on your campus?	Yes	39 (43.3%)	29 (33.7%)	25 (33.8%)	93 (37.2%)
	No	51 (56.7%)	57 (66.2%)	49 (66.2%)	157 (62.8%)
Use of internet for academic purpose.	Yes	79 (87.7%)	61 (70.9%)	42 (56.8%)	182 (72.8)
	No	11(12.2%)	25 (29.1%)	32 (43.2%)	68 (27.2)
	Everyday	65 (78.3%)	50 (60.2%)	40 (47.6%)	155 (62%)
	2-5 times a week	10 (12%)	15 (18.1%)	20 (23.8%)	45 (18%)
How often do you use the internet for academic purpose?	Once in a week	5 (6%)	5 (6%)	14 (16.7%)	24 (9.6%)
	Only when I have an assignment	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	Undecided	3 (3.6%)	13 (15.7%)	10 (11.9%)	26 (10.4%)
	Handset/Smartphones	40 (48.2%)	50 (60.2%)	42 (50%)	132 (52.8%)
	School Café	13 (15.7%)	8 (9.6%)	10 (11.9%)	31 (12.4%)
	Café outside school	20 (24.1%)	7 (8.4%)	14 (16.7%)	41 (16.4%)
What medium do you use to access the internet?	Modem and laptop	7 (8.4%)	5 (6%)	8 (9.5%)	20 (8%)
	Undecided	3 (3.6%)	13 (15.7%)	10 (11.9%)	26 (10.4%)
	Yes	80 (88.9%)	75 (87.2%)	64 (86.5%)	219 (87.6%)
	No	10 (11.1%)	23 (12.8%)	10 (13.5%)	31 (12.4%)

In view of how much they employ the internet for academic purpose, a significant statistical difference was found across institutions $F(2, 247) = 2.83, p < .5$. TSU students reported to use the internet on a daily basis ($M = .314, SD = .063$) more than FUK ($M = .268, SD = .064$) and FUG ($M = .141, SD = .048$) (see Table 2). Overall, a considerable number of students affirmed that they often use the internet for their academic research and learning (72.8%). There was no significant difference with respect to the medium used for accessing the internet among the students $F(2, 247) = 1.83, p > .5$. Most of the students (52.8%) averred that they make use of their handsets or smartphones to access the internet. This might be due to the lack of efficient internet facilities on their campus. Furthermore, no significant difference regarding the impact of the internet on their research and learning $F(2, 247) = 1.63, p > .5$. Nearly the whole students (87.6%) reported that the internet has and is still improving their academic research. However, TSU students (88.9%) had a strong conviction that the internet has and is still improving their

academic research than FUK (87.2%) and FUG (86.5%). The next section examines the specific benefits derived from the usage of the internet.

Table 3. Benefits of the use of internet in your academic research and learning.

No	Responses	M	SD	t	df	P
1	Increased access to current and valuable research found on the internet has been so beneficial and has improved my research in addition to other academic learning.	4.647	0.654	25.407	249	.000
2	The internet has facilitated my research process, that is, a task that would be completed over a long period of time now takes a short period of time to execute	3.824	.7368	11.289	249	.000
3	Information is easily retrieved from the internet and this has been so beneficial to my academic research and learning	2.892	.9638	2.994	249	.000
4	The availability of numerous sources on the internet has brought a tremendous improvement in my academic research and learning	2.980	.8441	7.353	249	.000
Total		3.586	.4344	13.618	249	.000

As shown in Table 3, a one sample t-test was run to realise the extent at which the students rated the benefits they gain from internet utilization for their research and learning. Overall, these results suggest that the students had a strong conviction on the usage of internet on their academic research and learning $t=13.618$ ($p. 000$) ($M=3.58$, $SD=.434$). Specifically, results showed the highest level of response ($M=4.64$, $SD=0.65$) on item number 1 (*Increased access to current and valuable research found on the internet has been so beneficial and has improved my research in addition to other academic learning*), and a significance level of agreement $t=25.407$ ($p. 000$). While Item 3 (*Information is easily retrieved from the internet and this has been so beneficial to my academic research and learning*) ($M=2.89$, $SD=.964$), had the lowest response rate, though it was significant. $t=2.994$ ($p. 000$). This means that most of the students believed that the increased access to current and valuable research found on the internet has been so beneficial and has improved their research in addition to other academic learning. To further realise the association between internet usage for academic purpose and the impact it has on research and learning of the students, a Chi square test was performed. Results indicate that there is an association between the use of internet for academic purpose and students’ academic research and learning $\chi^2(2, N=250) = 11.187$, $p < .5$. Further results also showed an association between the time spent using internet for academic purpose and students’ academic research and learning $\chi^2(2, N=250) = 13.187$, $p < .5$. This infers that the more the students use internet for academic purpose the better their academic research and learning could be.

As revealed in Figure 1, Google is the most search engine utilized by the students for their academic research and learning (68%), followed by Yahoo search engine (20%), which was rated as second, Bing (8%) as third and Wink (4%) as fourth. The students that maintained undecided response were (4%) and there were no responses found for live search.

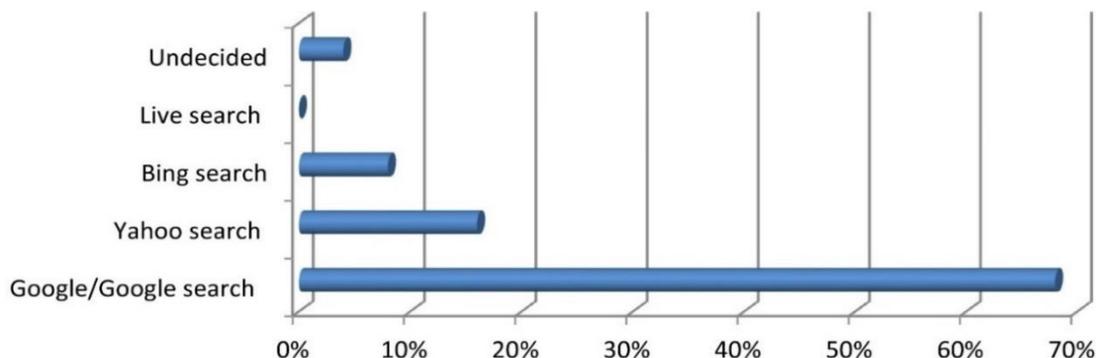


Figure 1. Search engine used.

With regards to the most used internet sources for academic purpose, a huge number of students (68%) alleged to the use online journals when compared to other online materials found on the internet (See Figure 2).

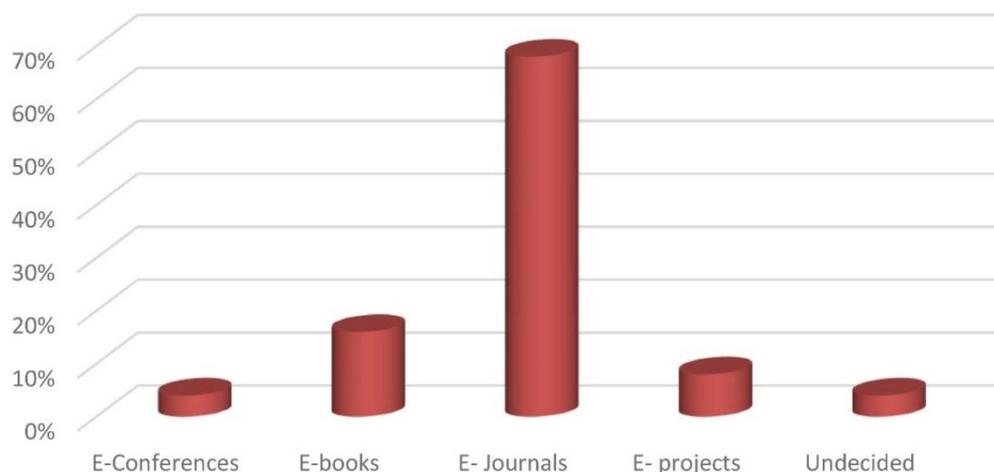


Figure 2. Most used internet sources for academic purpose.

4.5 *The challenges faced by students in accessing and utilizing the internet facilities*

The challenges confronting students in accessing and using the internet facilities for educational research and learning were analysed through an open-ended question from the survey carried out among the 250 sampled students. The rationale behind this question was to have a deeper understanding of the students' experiences, regarding the challenges they encounter in accessing and utilizing the internet facilities. Of the total responses, almost 85% of the students claimed that their universities do not have an efficient cybercafé and internet facility. They believed that this might have limited their access to the internet within their university premises. This has resulted in the over-dependency on their mobile telephone, as well as purchasing internet data plans from other service providers such as a mobile telecommunication company (MTN Group), Globacom, Etisalat and Airtel telecommunications company. This is one major aspect that hinders the student's regular access and utilization of the internet, which likely slowed down the pace of carrying out assignments given to them in school. It was observed that the subscription of the data plan is sometimes problematic, as there are time lags in the internet connectivity and slow access speed of these networks.

A considerable number of the students had the opinion that compared to higher institution in developed countries, their institutions need an electronic library, where they can easily access scientific journals from databases such as Elsevier, Springer, Taylor and Francis, Wiley, SAGE and Emerald. They believed that this will lessen the reliance on Google, Google Scholar and open access journals as well as will provide a means to explore other related scientific papers, in order to elevate their academic learning and research beyond its current situation. Some of the students observed that they come across substantial and relevant scientific papers online but could not gain access to them, due to lack of subscription to scientific databases by their institutions. The students also believed that the irregularity of power supply in their University premises, dormitory and homes, discourages internet accessibility for academic purposes. This submission means there is an insufficient digital readiness among the sampled institutions.

4.6 *The effect of accessing and utilizing electronic resources for academic research and learning.*

Students perceived benefits from the use of internet resources for research and learning

In order to present detailed explanations on the students' perceived benefits of using the internet resources for their academic research and learning, a focus group discussion was held with 18 students from the sampled universities. See Table 1 in methodology section, which demonstrates how each group was composed and referred to in the analysis. At the initial phase of the focus group discussion, the students were asked some preliminary questions such as *if they had access to internet facilities on your campus; if they use the internet for academic research and learning; how often they use the internet for academic research and learning; which medium they use to access the internet; the internet resources they consult the most for academic inquiry; and the challenges they face in terms of internet access and utility.* The second phase of the focus group considered *the aspects at which the internet has improved the students' academic learning and research.* The results showed that most of the students affirmed that they have limited access to internet facilities on campus, suggesting that there was no efficient cybercafé and internet facility on campus, resulting to them depending on their mobile devices. Most of the students

also allege that they have access to the internet via their laptops and cybercafés outside their university premises. These results are consistent with the responses obtained from the surveyed students in Table 2.

The focus group participants claimed that they utilize the internet for academic research and learning purposes. Most of the students ($n=15$) 83.3 said that they utilise it every day, while ($n=2$) 11.1 % commented that they use it 2-5 times in a week, and only ($n=1$) 5.5% utilize it once in a week, implying that most them frequently utilize the internet for academic research and learning purposes. Additionally, the entire sampled focus group students said they often use Google and Google search engine for their academic inquiry. Also, the students claimed to use the online open access journals more often because is perceived to be readily available to them. These claims are in line with the survey conducted among the 250 students.

The focus group participants shared similar challenges as highlighted by the surveyed students. The students claimed that despite their institutions do not provide adequate and efficient internet facilities, suggesting insufficient digital readiness, yet the they strive to be self-organized, resilience and resourceful. In line with these, the students were further asked to comment on their experiences and perspectives as it regards to internet utility for their academic research and learning. Table 4 presents the key themes identified from the students' comments.

Table 4. Students' perceived benefits from the utilization of internet resources for research and learning.

Identified themes from the students	Summarised findings
Enable students to carry out research in advance/ahead of time. Tackling of multiple homework.	<ul style="list-style-type: none"> • Sourcing materials via e-books and e-journals enabled the students to conduct research ahead of time, thereby easing and improving their academic research and learning. • Most of the students had the belief that the utilization of the internet has helped them in tackling multiple and difficult homework. • The students also agreed that the internet has made sourcing and downloading of relevant materials required for their academic research possible, which enable them to conduct multiple assignments within a committed deadline.
Widen the scope of reading and learning.	<ul style="list-style-type: none"> • Most of the students claimed that the use of the internet has permitted comparisons of different types of related literature that conforms to their given homework or classwork. This has inspired a broader scope of interpretation, reading and learning.
Enhance self-learning.	<ul style="list-style-type: none"> • The use of the internet enhanced most of the students' self-directed learning, which implies that there were able to discover new knowledge related to their courses on their own or together with their peers.
Encourages and enhances peer learning.	<ul style="list-style-type: none"> • The students affirmed that the use of the internet has aided them in sharing information with their peers, which they believed supported each other's learning. • This was achieved through electronic mail and other social technologies such as WhatsApp, Facebook and comments that other students gain on their group chats.
Ameliorates examination preparation	<ul style="list-style-type: none"> • Internet search engines such as Google, Google Scholar and electronic sources, including E-Journals, E-books and E-Conferences resources helped students prepare for examinations.

Enable students to carry out research in advance/ahead of time

The students stated that the use of internet sources has brought about positive change in their academic activities in general. They reported that searching for materials via e-books and e-journals enabled them to carry out research ahead of time, thereby easing and improving their academic research and learning. In line with this view, a student from Taraba state University comment that:

I do not require moving a far distance to source for materials anymore, I find almost everything I need online within split seconds and this has enhanced my research work [TSU 6].

This view is consistent with a participant from the Federal University Kashere, Gombe who remarked that:

Indeed, the internet is a boon to us, its usage has brought some positive effects on my academic growth [FUK 3].

Buttressing on this notion, a student from the Federal University Gashua believed that:

The emergence of the internet has changed the custom of travelling to other libraries and universities within Nigeria for the search of relevant materials to support research [FUG 2].

Tackling of Multiple homework

Most of the participants had the perspective that internet usage has helped them to tackle multiple and tasking or difficult homework that was given to them by different tutors. They also agreed that the advent of the internet has made it possible for them to source and download relevant materials required for their academic research and learning, and this has enabled them to conduct multiple assignments within a given deadline.

In this respect, a student from the Federal University Kashere, Gombe observed that:

On several occasions, our tutors give a series of assignments with deadlines, and this has been often tackled using the internet, which I believe has eased my burden. I only need to use up my time and search various databases available to retrieve relevant materials [FUK 6].

Similarly, a student from the Taraba State University comment that:

Sometimes when I am given a series of assignment I feel so worried and disheartened, yet, when I set out doing research using the internet I feel at ease as most of the materials I come across are related to what I require. This cuts down my burden and helps me in multitasking as well as enhancing my learning process [TSU 5]

In the same vein, students from the Federal University Gashua, concurred that the utilization of the internet has assisted them in carrying out tasking assignment within a short period of time, which is believed to have improved their research capability as well as their Cumulative Grade Points Average (CGPA). As such, one of the students from this focus group, advocated that:

The ‘tabs’ provided in Mozilla Firefox and Chrome enables us to open numerous pages simultaneously while navigating from one page to another to read pertinent materials. Before the advent of the internet, it was difficult to perform given multiple assignments in a lesser time, due to insufficient sources. As of then, students relied merely on printed sources in the library. Nowadays, the numerous electronic sources available have enhanced our research and academic output. Indeed, my CGPA has been enhanced when compared with my other classmates who do not frequently use the internet for their academic activities [FUG 3].

From the above student’s responses, the utilization of various internet resources for academic purpose has assisted them in conducting multiple and difficult assignments in a short period of time.

Widen the scope of reading and learning

Most of the students claimed that the role of the internet has also permitted comparisons of different form of literature that best conforms to each homework or classwork given to them by their respective tutors, this has inspired a broader scope of interpretation, reading and learning. In addition, they observed that the internet contributed to the easiness of research through downloading materials that support their study. They likewise believed that this has enhanced their academic research skills and learning.

One student from the Federal University Kashere, Gombe focus group emphasized that:

The internet as an online tool for research has widened our scope of reading and learning. It has made data retrieval easier, resulting in a positive impact on our educational research and learning development [FUK 1].

A student from the Taraba State University focus group asserted that:

I do not need to depend on one source when utilizing the internet, I just move from one source to another, comparing and at the end, select the best and suitable source which I believe to have enhanced my academic research and learning [TSU 3].

Congruently, a student from the same focus group session commented that:

The use of internet resources such as Wikipedia, Google and Google Scholar has improved our access to information on various courses, which I feel has greatly upgraded our scope of reading and learning. This has also resulted in a more serious academic achievement [TSU 1].

Similarly, students of the Federal University Kashere, Gombe affirmed that the ubiquity of the internet has enhanced the scope of their reading and learning process. One of the students from this focus group reported that:

I use my smartphones (raising his phone for emphasis) at any given time and situation to retrieve materials online. He further exclaimed, this is the ability of the internet, it is now in our pocket and we can take it along wherever we go [FUK 5].

Buttressing on this notion, a student from the same institution added that:

The benefit of mobile computing devices to my learning is the ability to access data rapidly. Because of the convenience of constant connectivity, these devices allow me to retrieve the course content quickly. Also, you can go to any available source you want to within a second and this has enhanced and broadened my knowledge in terms of research [FUK 6].

Enhance self-learning

It was found that the use of the internet enhanced most of the students' self-directed learning. The students claimed that there were able to discover new knowledge related to their courses on their own or together with their peers. They also opined that the availability of how-do-it online videos, such as YouTube tutorial videos, has extended their skills in research and has helped them to get conversant to certain practical and technical aspect of their various courses. One history student from the Federal University Gashua perceived that:

The online YouTube tutorial has exposed me to different prior and recent research trends and evidentiary findings of researchers, which in turn has infused and gave me the required knowledge for improving my research. For example, there are historical events that I watch on YouTube, which has really influenced my learning process. Courses such as Advanced History has been made easily understood through YouTube online Videos [FUG 1]

Drawn from the students' responses, it could be deduced that the students in the sampled Universities believed that the use of the internet, most especially YouTube is improving their learning and research to an extent. Regarding the internet and class activities, the students alleged that although their individual institution has insufficient internet access and digital readiness, yet, they have become self-organized, resilience and resourceful using their mobile phones and other available means such as Cybercafé outside their university premises. These students believe that the use of the internet through the Google and Google Scholar search engine, improved their knowledge of research and learning at large, suggesting that the use of the internet stimulates the student-centred learning. Consistent with this view, a student remarked that:

Although subscribed scientific electronic databases are not yet available in our universities, moreover, some of our lecturers do not communicate with us via email. Still, I can claim that I do learn a lot through the internet on my mobile phone, and Universal Serial Bus (USB) modem on my laptop. The availability of Google and Google Scholar search engine has enhanced my learning. I feel the internet is a platform to educate and acquire more knowledge, and this has improved my CGPA [TSU 4].

The comments derived from the students demonstrated that they were relatively more self-directed when using the internet. The students at the Federal University Gashua believed that the internet has promoted self-learning, thereby developing their abilities to think critically and exercise analytical skills. In line with this, a student within this focus group commented that:

The use of the internet which has enhanced self-learning enables us to be more critical thinkers as we are exposed to a plethora of information. The student added that there is a proverb which says knowledge is power, thus, the internet has made us powerful critical thinkers [FUG 3].

Similarly, in the same focus group session, a student remarked that:

I now make constructive comments in class due to the numerous research I conduct online and this has also increased my intellectual capability to imagine beyond my peers. Also, I now think carefully before leaving a comment, so in a way, I believe the usage of the internet has not only improved self-learning but promotes critical thinking [FUG 4].

In the same way, a mass communication student at the Taraba State University ascertained that:

Through the internet, I have been able to learn more about graphic communication, motion graphic videos and 3D animations. Although our tutors teach us these subjects in class, yet, when I study alone via the internet, I get an in-depth explanation, which I feel better my academic learning [TSU 01]

The above students' comments, suggest that the utilization of the internet to an extent has improved the quality of their overall learning outcome.

Encourages and enhances peer learning

Research has described “peer learning” as the sharing of beneficial academic information from one student to another with the aim of supporting both formal learning activities such as revising for examinations and more informal or incidental learning (Hamid et al., 2015). It was found that all the students in the various focus group were affirmative that the advent of the internet helps them share information with their peers to support each other's learning. This is evident as students share knowledge with each other through email and other social technologies such as WhatsApp and Facebook. They likewise gained knowledge from their peers through materials collected for group assignment on wikis, including comments that other students make on their group chats. For example, a student in the Federal University Kashere, Gombe focus group claimed:

I am always online when compared to some of my classmates. This always prompts them to ask if I have found new relevant information to share. I always share useful information discovered on the Internet in our group chats, as well as post them on Facebook. It is now easier to share substantial information with my peers which I believe has enhanced my peer's knowledge [FUK 4].

Consistent with this comment, another student in the same focus group stated that:

At large, a greater occurrence of both off-curriculum (informal) and curriculum-based interactions among students is enabled by the internet. I share the internet retrieved information with my fellow classmates through Skype and WhatsApp Video calls. I likewise post useful downloaded tutorial videos to them via the same medium. From their remarks, the access and use of the internet have greatly improved their academic growth [FUK 2].

Similarly, a theatre art student at the Federal University Gashua asserts:

Through the internet, I and my course mates are able to communicate and collaborate on the course content by using mobile computing devices as well as laptops to text message and email. This has made it comfortable for us to share information that is vital and up-building. I recalled when we were given a very difficult assignment task, I searched the internet but could not find any related sources, one of my classmates who understood the utilization of the internet better, found a relevant material and emailed it to me. This material enhanced my assignment, which in turn improve my CGPA. With a smile on his face, the student exclaimed ‘I had an A in that course’ [FUG 5].

These findings suggest the students perceived that informal interactions such as friendly chat among friends were often converted to academic debate on course topics. Additionally, the students claimed that they share knowledge with each other through the internet technological devices such as email and social networking sites, including Facebook and WhatsApp.

Ameliorates examination preparation

Internet search engines such as Google and Google Scholar as well as electronic sources including E-Journals, E-books and E-Conferences were particularly helpful to the student in their preparations for the examination. Most of the focus group members agreed that they regularly utilize Wikipedia as it offers initial orientation and basic information that occasionally simplifies and clarifies certain topics. However, some of the students believe that it has limited knowledge or importance when compared with other sources such as library resources, including e-books, learning management systems, and academic literature databases. In addition, the entire students that participated in the focus group divulged that the use of internet has bettered their examination preparations. For example, a student at the Federal University Gashua remarked that:

There are subjects or topics that I do not truly attain a better understanding in the class even when taught by our tutors, only with the help of the internet, I have been able to source extra and simplified materials that enhanced my understanding of a subject or discipline before the

exam. This has enhanced my intellectual capabilities as well as eases my examination preparations with positive results.

Likewise, students at the Taraba state university felt that they had the opportunities to support their course material through the internet. For instance, one of the students mentioned that:

The materials I retrieve online are added advantages to the lecture notes given to us by our lecturers. For instance, most of our lecturers still give their lecture notes through verbal dictation in the class and this sometimes provides insufficient information, as critical listening is demanded to grasp all the point made. I often download related materials to support my lecture notes for better examination preparation and this has generally increased my academic learning with better results. I could recall in one of the semesters during my third year, I entirely relied on the lecturers and this had a negative impact on my semester results, however, in the next semester when I downloaded various related sources to support the lecturer's notes, I had a better grade. Indeed, sourcing additional materials on the internet to support my lecturer's notes has helped me mostly in the preparation of examination [TSU 3].

These established that students better prepared for their examination with the aid of the internet. This also suggests that the students believe that the use of the internet supports their study and serve as a tool to enhance their academic research skills and learning.

5. Discussion and Conclusion

Technological development in universities within the Northeastern Nigeria is not much advanced and has been less well-studied in terms of the implementation of information and communication technology (ICT), although the literature is growing. This paper researched into the challenges facing the students in this region as it relates to internet usage for academic research and learning and how they find ways to make use of the internet to facilitate their studies. It also examined the perceived benefits they derive from the utilization of the internet for their studies. The results of this study revealed no significant difference across the sampled institutions with regards to the adequate access to internet facilities $F(2, 247) = 1.13, p > .5$. This means that a large number of the students (62.8%) asserted that they have no adequate internet facilities in school. However, it was observed that TSU students reported to have more internet facilities than FUK and FUG. This supports a prior study by Ani (2010) which found that undergraduate students require the internet to do their research work, however, it was not feasible due to poor access in their libraries, departments/faculties and computer/information and communications technology centres. The same study showed that a vast number of the students depended on private internet services and cyber cafés.

This study revealed a significant difference across institutions with regards to the frequency of internet usage for academic purpose $F(2, 247) = 2.83, p < .5$. TSU students reported to use the internet daily compared with FUK and FUG. Overall, a substantial number of students affirmed that they often use the internet for their academic research and learning (72.8%). On the contrary, Ureigho et al's (2006) results, disclosed that students use the internet mainly for online chatting (24.89%) and e-mail (24.16%) purposes, rather than for research materials, which was ranked as third (23.21%). These findings showed that the internet can be used differently by students in tertiary institutions in terms of academic research and learning, as well as leisure/entertainment. Furthermore, the current research found no difference with respect to the medium used for accessing the internet among the students $F(2, 247) = 1.83, p > .5$. Most of the students (52.8%) claimed that they often use their handsets and smartphones to access the internet. This is consistent with prior studies suggesting that most the undergraduate students who utilize the internet for educational and entertainment purposes depended on their mobile devices for internet access (Ahmed & Bukar, 2016; Otunla, 2013; Agboola, 2010).

There was no significant difference regarding the impact of internet on the sampled students research and learning $F(2, 247) = 1.63, p > .5$. Thus, a considerable number of the students (87.6%) reported that the internet has and is still improving their academic research. However, TSU students (88.9%) had a stronger conviction. Furthermore, the students had a strong conviction on the usage of internet on their academic research and learning $t=13.618 (p. 000) (M=3.58, SD=.434)$, as large number of the them ($M=4.64, SD=0.65$) reported that the *Increased access to current and valuable research found on the internet has been so beneficial and has improved their research in addition to other academic learning*. Thus, an association was found between the use of internet for academic purpose and students' academic research and learning $\chi^2(2, N=250) = 11.187, p > .5$, as well as between the time spent using the internet for academic purpose and students' academic research and learning $\chi^2(2, N=250)$

= 13.187, $p < .5$. This is consistent with studies which reported that the internet contributed to the easiness of research through downloading materials as well as enhanced the cognitive operation of information dissemination (Emeka & Nyeche, 2016; Adekunmisi et al., 2013; Nwezeh, 2010).

In this current research, the students also claimed that they mostly used Google, Google Scholar and Yahoo search engine. Consistent with this result, Bashir et al.'s. (2016) found Google and Yahoo search engine to be frequently used among students. Our study showed that the students reported to frequently use online journals when compared to other online materials found on the internet. A previous study confirmed that E-journals and E-books are among the resources that students mostly used in their research work (Ivwithreghweta & Igere, 2014). However, there are challenges the students outlined in terms of internet access and usage. About 85% of the students' surveyed in the sampled universities claimed that access to the internet is discouraging within their university premises due to the inefficient cybercafé and internet facility, resulting to over-dependence on their mobile telephone. However, the students still strive to make use of the internet through other self-generated means, and this has enhanced their research and learning. This claim indicates that there is an insufficient digital readiness in the sampled institutions. Emeka and Nyeche (2016) reported slow internet server and the cost of paying for online services as the major problem found among students who use the internet.

A considerable number of the sampled students believed that their institutions required an electronic library/database (e.g., Elsevier, Springer, Taylor and Francis, Wiley, and Emerald) where they can easily access scientific journals. They also feel that the irregularity of power supply in their dormitory, homes and University premises, discourages internet accessibility and usage for academic purposes. This result is coherent with Ivwithreghweta and Igere (2014) who found power outage, slow internet speed, lack of computer terminals, too many hits or information overload and insufficient computers as the major factors militating effective access to the internet within Nigeria tertiary institutions.

Results from the students in the focus group resonates the outcome of the survey, suggesting they also face challenges and yet find ways to make use of the internet through self-organization, resilience and resourcefulness, which in turn facilitated their studies. This indicates that students in the focus group have skills and readiness in terms of internet utilization for research and learning. Contrary to this result, Agboola (2010) found that agricultural science students in a Nigerian university have limited skills in the utilization of available electronic databases. Our study also revealed that the students in the focus group perceived that internet utilization have helped them in carrying out research ahead of time, and this conforms with Adegboji and Toyo (2006) who found that the internet contributed to the easiness of students' research through downloading of relevant materials. Also, the focus group participants think that the internet assisted them in undertaking multiple home works, as well as widen their scope of reading and learning. They alleged that the internet has permitted comparisons of different types of related literature that suits their respective homework or classwork, and that this has resulted to a broader scope of interpretation, reading and learning. This is in harmony with a prior study, which found that the internet enables students to access relevant and up to date materials for their research (Adogbeji & Akporhonor, 2005).

The focus group participants likewise claimed that the internet promotes their self-learning as well as encourages and enhances peer learning. These students believed that through the internet, they were able to discover new knowledge related to their courses, individually or as a group. They feel that the availability of how-do-it online videos, such as YouTube tutorial, has broadened their academic research and have helped them to be conversant with certain practices and technical aspect of their various courses. This result supports Hamid et al.'s. (2015) findings, which establish that internet utilization helped Australian and Malaysian students in sharing of materials for a group assignment, and this, in turn improved their self-directed learning. The focus group participants also think that the internet helps them in ameliorating examination preparation, which is achieved through sourcing materials from search engines such as Google and Google Scholar, as well as electronic sources including E-Journals, E-books and E-Conferences. This is in line with previous investigations suggesting that the internet plays a significant role in assisting students for better preparation of their continuous assessment and semester examination, which had a positive impact on their results (Ivwithreghweta & Igere, 2014; Ogedebe, 2012). Conclusively, our study revealed that students perceived internet utilization to have a positive impact on their academic research and learning, despite the insufficient digital readiness by their respective institution.

5.1 Recommendations

This study proposes the following suggestions to improve the internet access and usage for educational research and learning in the studied area.

- Tertiary institution in developing countries should build efficient cybercafé as well as provide internet facility within their premises and subscribe electronic scientific database. This will enable more access beyond the use of smartphones as well as the use of open access resources such as e-journals, e-conferences, e-thesis and dissertation.
- The sampled institutions need an electronic library where the students can easily access scientific journals from databases such as Elsevier, Springer, Taylor and Francis, Wiley, and Emerald. This will lessen the reliance on Google and Google Scholar as well as provide the means to explore other related scientific papers which will improve their academic research and learning.
- The irregularity of power supply in the sampled University premises should be improved to encourage internet accessibility for academic purposes. This will reduce the running out of power/battery on the students mobile and Laptop devices, which often interrupt their use of the internet. When this is resolved, it will improve their academic research and learning of students large.

5.2 Limitations and directions for future research

The findings of our study demonstrate the challenges facing students as it relates to internet usage for academic research and learning and how they find ways to make use of the internet to facilitate their studies. It also examined the perceived benefits they derive from the utilization of the internet for their studies. It also generated useful data to build more understanding and insight into the use of the internet among students. Our study only focused on North-Eastern Nigerian students, which seems to be a limitation as it regards to the wider transferability and generalizability of this study findings. Nevertheless, our study is founded on real-life students' experiences, as such, contributes in enhancing the empirical research results that are beneficial for informing teaching and learning practice in higher educational settings. A longitudinal and ethnographic study where a researcher spends a significant amount of time observing the students' use of internet resources would be valuable in providing richer insights about how internet resources impact students learning, research, and academic performance in general.

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