

Evaluation of Undergraduates and Postgraduates' Utilisation of Internet for Academic Purpose in STREAM Fields

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Abstract

This study examines undergraduates and postgraduates use of the internet for academic purposes in STREAM fields. A mixed method research which sampled 100 respondents selected through snowballing sampling technique. Four research questions and one hypothesis guided this study. Two instruments namely Internet Usage Questionnaire (IUQ) and semi-structured interview on challenges experienced in the utilisation of internet (IUI) were employed for data collection. Standard deviation and independent sample t-test analysed the descriptive (quantitative) aspect of questions and hypothesis raised respectively, while thematic analysis was employed in the narrative (qualitative) section. The study found that mobile apps, software, and website were among the media through which students access academic resources on the internet. No significant difference was found in the level of usage of the internet for academic purposes between undergraduates and postgraduates in STREAM fields. Poor internet facility, high cost of internet subscription, wide search for relevant academic resources due to inaccessibility to paid resources and many ad pop-ups owing to unlicensed software were among the challenges experienced by the respondents. Furthermore, stakeholders are enjoined to make available fast and affordable internet to ease the concerns raised.

Keywords: *internet, STREAM, Utilisation*



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INTRODUCTION

The strength and weakness of nations across the world is a measure of their sophistication and education in Science, Technology, Robotics, Engineering, Aesthetics [Arts] and Mathematics (STREAM). Competency in STREAM has implications for economic competitiveness, sufficient and sustainable energy, efficient healthcare, technological development among others (Badmus & Omosewo, 2020; UN, 2023; UNESCO, 2017). The internet is a powerful and efficient tool for searching, retrieving, and disseminating information (Amaechi et al., 2022). The internet has significantly impacted students and scholars worldwide, especially in tertiary institutions where teaching and learning processes require a great deal of improvement (Adomi et al., 2018; Binali et al., 2021). It becomes imperative to educate learners with such skills for access, organisation, evaluation and communication of information (Aqil & Ahmad, 2011;

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Toprakçı, 2017). The internet has been a very important instrument for facilitating academic activities in tertiary institutions world over. There has been tremendous statistical growth in the use of the Internet and world wide web for searching and sharing information (Ojedokun, 2016). In today's world, the internet plays a vital role in teaching, research and learning processes in academic institutions (Kaur, 2018; Nwokedi, 2017). Arguably, unlimited wealth of resources readily available and accessible to millions of users is simultaneously present on the internet (Kumar & Kaur, 2016).

The use of the internet among university students has forms and purposes. As to the forms; usage of internet during and for distance learning, and as a supplementary tool for education (Binali et al., 2021; Blummer & Kenton, 2020; Tsai et al., 2021). The purposes include communication [through e-mail, chats etc.]; entertainment [via games, betting gambling, etc.], learning [courses, augmentation, repetition, news and more] (Aqil & Ahmad, 2011; Burns et al., 2022). The way students relate to the internet may be categorized into three with respect to their role: producing, consuming, and copying of content on the internet (Aqil & Ahmad, 2011; Gamage et al., 2020; Garcia-Melgar & Meyers, 2020). Access and utilisation of the internet possess the tendency to stimulate positive changes and create conducive learning environment capable of responding meaningfully to the needs of learners (Alakpodia, 2016; Gudimani & Mulimani, 2018; Kamba, 2019). The internet also provides global opportunity for the provision of value-added services by libraries for indexing, abstracting and publication of globally generated research and their digitization as means of facilitating knowledge (Aqil & Ahmad, 2011; Ramkissoon et al., 2020).

Ajala (2017), Khuluqo et al (2021) and Jagboro (2018) maintained that the internet has opened numerous possibilities for resource sharing at local and global levels and that information on latest journals, books and discussions can be exchanged directly using internet services. Advances in computer technology have enabled the internet to serve as a platform not only to seek information, but also to exchange ideas and knowledge with other users. Similarly, the internet facilitate communication through scholarly and expert opinions from resources on electronic media and via email, teleconferencing, chatting and other avenues. Furthermore, the advent of social network sites such as Facebook, Twitter, LinkedIn and others which provides services in form of virtual interaction has changed the perception of Internet use from one that is not only associated with learning but as facility to socialisation (Mbamalu, & Onyido 2019; Soroko et al., 2020).

The world today is information-driven, and the internet has become key in education and for educators (Kenneth, 2022; Nguyen et al., 2022; Pei & Wu, 2019). The rationale for internet usage in tertiary institutions in both developed and developing world have had far reaching implications (Badmus & Jita, 2022; Maheshwari, 2021). The study of Tseng et al (2020) revealed that internet utilisation by undergraduates and postgraduates contribute to learning and growth mindset as well as improve students' self-efficacy among students. Similarly, an examination of the similarities and differences in the usage of digital library among undergraduate and postgraduate students was conducted by Xu and Du (2019). In their study, postgraduate students were more satisfied with the information quality, service quality, affinity, information quality, perceived ease of use and usefulness. Online learning cannot be separated from the use of internet in tertiary institution. Barriers to undertake online learning in Vietnam was researched by Maheshwari (2021). Undergraduates and postgraduates from public and private universities were examined in the study during pandemic to ascertain factors affecting their online learning. Internet speed and access along with ICT infrastructure formed the factors aggregated. The need for integration and/or utilisation of internet for academic purposes in developing countries remain a challenge to date. Undoubtedly, the internet has in abundance resources for students in higher institutions and can arguably be utilised to improve learning (Kenneth, 2022; Pei & Wu, 2019). As elicited, previous studies have

traversed the use of internet for different purposes, vis a vis academic research, online socializing, and entertainment. However, the differences in the levels of usage among undergraduates and postgraduate with respect to STREAM fields especially in the developing world is yet to find depth in the literature. Experiences and challenges specific to students, especially in STREAM fields in tertiary institutions require more investigation. Consequently, the evaluation of medium, extent, level of usage, challenges and implication of internet within the aforementioned context is the focus of this study.

THEORETICAL GUIDE

Social information processing theory and media equation theory guided this study from a pragmatic paradigm. Social information processing theory developed by Joseph Waiter in 1992 relates to online information. This theory explains interpersonal communication theory between face-to-face interaction as against the online interaction with the later having the same effect over a period as the former. This presumes that students' interactions are likely to be influenced by their disposition to the internet.

Similarly, Media equation theory developed by Byron Reeves and Clifford (1996), as noted in Asemah (2011) and Asemah and Edegoh (2012) proposed that media are equal to real life and that electronic media are being given human attributes. For instance, the interaction between humans and computer is relative to human-to-human interaction. Griffin (2006) noted that the internet is equal to real life. The author reiterated what Reeves and Nass's equation suggests that humans respond to communication media as if they are living being. Griffin maintained that the practical application of the media equation is that once we turn on a television or boot up a computer, we follow all the rules of interpersonal interaction that we have practiced throughout life. In this study, we consider the usage of internet and its implications based on the afore-listed theories.

LITERATURE REVIEW

The study of Maheshwari (2021) examined intention to undertake online learning among students in Vietnam during pandemic. The study sample 145 undergraduates and postgraduate students using structural equation modelling for data analysis. The study revealed that slow internet, lack of internet access and poor ICT infrastructure were among the factors affecting both undergraduates and postgraduates in Vietnam. Also, an investigation of online and offline learning was done by Pei and Wu (2019) among undergraduates of medical education background in a systematic review of literature. The study combed four journals and 5 data bases for meta-analysis. The study found that online learning works with better learning advantages for medical education student compared to offline learning.

Similarly, similarities and differences between postgraduate and undergraduate satisfaction in the utilisation of digital libraries was compared by Xu & Du (2019). A total of 426 respondents' data were analysed in the study using One-way ANOVA. Postgraduate students perceived digital libraries to be easier and useful compared to undergraduate students. Also, better satisfaction with respect to information quality, affinity, system quality and service quality were noticeable among the postgraduate students. In addition, characteristics and complexity of first-time online learning engagement by postgraduate and undergraduate students was explored to elicit finding on growth mindsets and flexibility in the United State by Tseng et al., (2020). From pathway analysis, self-efficacy and growth mindset have positive relationship to students' engagement online.

Apuke and Iyendo (2018) researched the utilisation of internet among university students to check

their perception access and utility. The researchers employed a mixed method to gather data from 250 undergraduates in North-East Nigeria. Lack of digital readiness, absence of e-library and poor internet facility were among the challenges reported. Khasawneh (2015) reported that most students from a Botswana university accessed the internet for 1-5 hours per week. There are also comparative studies on the time spent online by students from different fields of study at the university. The study conducted by Kim et al (2017) posited that science students accessed the internet for an average of 8.5 hours per week, as compared to 4.6 hours per week for social science students. Similarly, Alamr (2019) reported that students used the Internet 9.2 hours per week on average. The study further showed that students in STREAM-related fields were online for a longer period compared to students in other fields. Chan and Fang (2007) investigated the use of the internet among young people in Hong Kong. It was reported that the internet was used for different purposes such as making friends, shopping, listening to music, having fun, doing homework, and finding information for further education.

Despite the many obvious advantages of the internet to students, the amount of time spent online [internet] by adults, especially those in higher education online has generated concerns among researchers (Garcia et al., 2015; Mbamalu & Onyido, 2019; Rouis et al., 2011). According to Chen and Pen (2008) students who have difficulty controlling the time they spend online may be suffering from internet addiction, which can negatively impact their academic performance. Yu (2016) found that, on average, university students spent 164 minutes per day on the internet. Feng et al (2019) found that 47% of African American college students spent an average of two hours per day online while a small percentage of the students spent 5- 6 hours. Adhikari (2020) and Kilic and Guzeller (2017) explored the factors influencing internet usage. The former was conducted in Nepal among undergraduate students, the later was conducted among secondary school students from Turkey. The two studies were descriptive which employed questionnaire for data gathering. These two studies found that students hardly utilise the internet for academic purpose except when supervised, guided or directed. Additionally, social networking, gaming and entertainment were among principal reasons why students use the internet as reported. Alvarez-Risco et al (2021) investigated the influence of stress caused by technology, communication overload, social overload and performance during Covid-19. The cross-sectional study which analysed 2286 medical students through structural equation modelling [PLS-SEM] found positive influence of technology stress which negatively affect academic performance among the respondents.

RESEARCH METHOD

The study employed a sequential complementary mixed method. The qualitative aspect was narrative which involved collection and thematic analysis of non-numerical data from audio recording and notes to understand concepts, opinions or experiences from participants. Quantitative aspect of this study employed a descriptive survey through questionnaire to acquire numerical data for statistical analysis. The population for this study comprised of undergraduate and postgraduate students with target population as those in STREAM fields in two universities in North Central, Nigeria. These respondents were from faculties of Agriculture, Basic Medical Sciences, Clinical Sciences, Engineering and Technology, Environmental Sciences, Life Sciences, Pharmaceutical Sciences, Physical Science, and Veterinary science. Quantitative data were obtained from one hundred (80:20) undergraduates and postgraduates while 10 (6:4) of the respondents formed the sample for qualitative data obtained through semi-structured interview. Quantitative data obtained from the responses were coded and analyzed using SPSS. Furthermore, the quantitative data collected were analyzed using percentage to present the demographic information of the respondents,

descriptive statistics of frequency and percentage was used to answer research question one and mean and standard deviation was used to answer research question two.

Furthermore, the hypothesis was answered using independent sample t-test at a 0.05 level of significance. The qualitative data obtained from the students through the interview was transcribed and thematic analysis of the transcription was carried out using NVivo. The research instruments employed were semi-structured interview and online-based closed-ended questionnaires (Google form) titled Internet Usage Questionnaire (IUQ). Both the IUQ and Internet Usage Interview Template (IUIT) were researcher designed. Expert judgement was employed to validate and check for trustworthiness after evaluating observable variables from extensive literature positions. Experts validated the items of the interview questions and the questionnaire in terms of clarity, usability, appropriateness of language, ambiguity and relation of questions asked to research questions and hypotheses. Comments and suggestions were carefully studied and used to improve the quality of the instrument.

Section A of IUQ contains the demographic information of the participants. Section B contains construct relating to the medium used in assessing academic resources on the internet. Section C contains items relating to the academic purpose for which the internet is used among respondents. The semi-structured interview template contained questions about the challenges faced in accessing academic resources on the internet and how the challenges can be addressed. The researchers sought the consent of the respondent with consent forms and identified them with pseudonyms throughout their responses. The researcher generated a uniform resource locator (URL) and sent the link to the participants through WhatsApp chat, email and text messages. The interviews were conducted face-to-face and in other instances via Zoom and Google Meet for qualitative data.

RESULTS AND DISCUSSIONS

Table 1. Demographic Information of the Respondents

Variables	Grouping	Frequency	Percentage
Gender of Students	Male	46	46.0
	Female	54	54.0
	Total	100	100.0
Academic Level1 of respondents	100	7	7.0
	200	12	12.0
	300	18	18.0
	400	35	35.0

Variables	Grouping	Frequency	Percentage
	500	5	5.0
	Masters	22	22.0
	PhD	1	1.0
	Total	100	100.0
Faculty	Agriculture	14	14.0
	Basic Medical Science	7	7.0
	Clinical Science	6	6.0
	Engineering	17	17.0
	Environmental Science	9	9.0
	Life Science	21	21.0
	Pharmaceutical Science	5	5.0
	Physical Science	17	17.0
	Veterinary	4	4.0
	Total	100	100.0

Research Question One: What media are used for accessing academic resources on the internet among STREAM undergraduates and postgraduates?

Table 2. The media used among students in STREAM-related fields for accessing academic resources on the internet

Media	Frequency	Percentage
Mobile App	16	16.0
Software	2	2.0
Website	55	55.0

Media	Frequency	Percentage
Mobile App and Website	14	14.0
Website and Software	6	6.0
Mobile App, Website and Software	7	7.0
Total	100	100.0

Research Question Two: what is the frequency of internet utilisation for academic purposes among Undergraduate and Postgraduate students in STREAM fields?

Table 3 revealed the frequency of students' usage of the internet for academic purposes. The items on the questionnaire were structured in such a way that a mean value that is equal to or greater than the benchmark value of 2.50 indicates that the students regularly use the internet for academic purpose while a mean that is lesser than 2.50 indicates that the student does not regularly use the internet for academic purpose frequently. From the results, it is observable that most of the items have a mean value greater than the decision scale of 2.50. Similarly, the grand mean of 3.21 > 2.50 indicated that students frequently used the internet for academic purposes.

Table 3. Frequency of internet usage for academic purposes among undergraduates and postgraduate students in STREAM

S/N	Items	Mean	Std. Dev	Remark
Searching and Reading Educational Information				
1	Visualizing infographics	3.25	0.89	Frequent
2	Visualizing images	3.32	0.71	Frequent
3	Visualizing educational chart	3.04	0.75	Frequent
4	Visualizing graphs	2.88	0.86	Frequent
5	Reading e-books/electronic textbooks	2.98	0.77	Frequent
6	Reading academic journals	3.46	0.59	Frequent
7	Reading conference articles	3.11	0.76	Frequent
8	Reading term paper	3.02	0.82	Frequent
Listening to Educational Discourse				
1	Listening to lectures.	3.72	0.60	Frequent
2	Listening to podcast	3.08	0.79	Frequent
3	Listening to online presentations	3.41	0.67	Frequent
4	Listening to quizzes	3.09	0.83	Frequent
5	Listening to educational programs	3.32	0.72	Frequent
Watching Instructional Videos				
1	Watching tutorials	3.72	0.59	Frequent
2	Watching podcast	3.00	0.79	Frequent
3	Watching virtual presentation.	3.49	0.67	Frequent
4	Watching conference session	3.11	0.85	Frequent
5	Watching webinar session	3.07	0.87	Frequent
6	Watching workshop session	3.09	0.89	Frequent

S/N	Items	Mean	Std. Dev	Remark
Downloading Educational Resources				
1	Downloading textbooks.	3.60	0.65	Frequent
2	Downloading published articles.	3.20	0.82	Frequent
3	Downloading webinar session	2.93	0.86	Frequent
4	Downloading podcast	3.02	0.83	Frequent
5	Downloading video tutorials	3.54	0.64	Frequent
6	Downloading educational software	3.14	0.82	Frequent
7	Downloading educational apps	3.35	0.83	Frequent
Uploading Educational Content				
1	Uploading textbooks.	2.69	1.05	Frequent
2	Uploading research articles.	2.47	0.97	Not Frequent
3	Uploading instructional videos	2.76	1.02	Frequently
4	Uploading images	3.03	0.99	Frequently
Scholarship Search/Application				
1	Searching for scholarship information	3.40	0.77	Frequently
2	Application for scholarship	3.20	0.92	Frequently
Academic Research				
1	Reading academic journals	3.49	0.64	Frequently
2	Reading conference articles	3.09	0.75	Frequently
3	Reading term paper	3.14	0.78	Frequently
4	Publishing research	2.81	1.04	Frequently
5	Searching for opportunities for interaction, and collaboration	3.23	0.90	Frequently
6	Searching for dissertation/thesis Communication	3.11	0.80	Frequently
1	Exchanging opinions on academic matters with my friends	3.81	0.44	Frequently
2	Communicating with my lecturers.	3.17	0.81	Frequently
3	Submitting assignments given by my lecturers.	3.75	0.50	Frequently
4	Sharing academic files with my classmates	3.76	0.47	Frequently
Grand Mean		3.21		

*Mean ≥ 2.50 = Frequent, Mean < 2.50 = Not Frequent

Hypothesis Testing

H01: There is no significant difference in the level of usage of the internet for academic purposes between Undergraduate and Postgraduate students in STREAM fields.

The result on table 4 shows the t-value of -1.392 with 98 degrees of freedom computed at a significance level of 0.05. Since the calculated Sig is 0.170 is greater than table value of 0.05, the null hypothesis is retained. Hence, there is no significant difference between Undergraduates and Postgraduates level of usage of the internet for academic purpose in STREAM fields.

Table 3. Independent t-test on utilisation of internet between Undergraduate and Postgraduate students in STREAM fields

Qualification	N	Mean	Std Dev	t-cal	df	Sig (2-tailed)	Decision
Undergraduate	77	79.48	10.44	-	98	0.170	H ₀ not rejected
Postgraduate	23	82.82	9.04	1.382			

p>0.05

Research Question Four: What are the challenges faced in accessing academic resources on the internet by undergraduates and postgraduates in STREAM fields?

To answer research question four, we identified 4 themes from the interviews as challenges faced by both undergraduates and postgraduates in STREAM fields. These challenges are;

- Poor internet connection
- High cost of internet subscription
- Wide search for relevant academic resources
- Ad pop ups due to unlicensed software.

Theme 1: Poor Internet Connection

Accessing resources requires a good internet connection to avail students of the opportunity to access materials that are relevant to their academic work. The internet service made available by network providers and the quality of the connection is a major factor which determines how well academic resources can be accessed on the internet when the need arise. Poor internet connection is a major challenge experienced when searching for academic resources on the internet. Internet speed is arguably not very encouraging in developing countries. As such, time spent to access online resources can be reduced or utilised for other activities.

One of the participants mentioned that, “The challenges I’m facing is the availability of the network because I’m the kind of person that search the internet a lot and the network gives me issues. It is sometimes tiring (P2). Similarly-Hmmm, the network is my major problem, it has been a major issue in accessing academic resources on the internet (P3).”

In addition, another participant said, “Errm, I particularly find network as my major problem, I use school Wi-Fi, which is not always reliable because the network fluctuates, so let me say the network is a big problem sha (P4).”

Also, a participant claimed that, “My main challenge is the network, network provider because at times we are trying to do some research on something, you are trying to do research and you go to the internet to get some information, on getting there, you try to use the internet, but the network is almost down or not working, and I think that is the main challenge we faced in our country (P7).”

Another respondent mentioned that, “‘Kuma’, I think the network is also a part of it because the

environment we find ourselves in presently, the network is not that stable, doesn't favour us at the moment because probably a developing area or something like that (P10)."

It is conclusive from the responses of the participants that most of the respondent attributed poor or slow internet connection as one of the major challenges they faced in accessing academic resources on the internet.

Theme 2: High Cost of Internet Subscription

Connection to the internet requires paying for a subscription through a personal internet-enabled device such as mobile phone, wireless router, modem, or optical fibre cables. This subscription is charged based on the package plan as determined by the network service providers. The respondents complained that the charges levied to subscribe by the internet service providers are high and not affordable.

The positions of the respondents are as follows, "Sometimes I don't have data and I'm a student. I have to wait until midnight for midnight for cheaper subscription. I may have forgotten in the night or not have the interest at the time (P1)."

Similar position was shared by another participant, "I think free internet will assist us. I can only buy data after eating. My parent sends me money once in a month. I have to be sure there is something left before buying data for internet (P4)."

In the same vein, another student stated that, "The rate of the data cost is very high (P9)."

Theme 3: Searching Wide to get the Relevant Resources

The internet is flooded with a lot of resources that are useful in academic context. However, for students to access the desired and relevant resources, the universities should have paid access to online resources where journal articles, books, license to software and simulation can be utilised. In the absence of the aforesaid, students result to searching a wide range of results to filter what is needed.

These are the respondents' expressions, "

Well, there are times even if you access the internet, locating the right content is another problem. You have to keep searching and searching before you get what you want (P3)."

Similarly, another participant asserts that, "Also, probably if I want to download maybe like something on chemical, maybe I just type it on the internet or I need a chemical structure, google may not give me the accurate thing until I check them one by one [one after the other] (P5)."

Theme 4: Too many ads pop up thus distracting their search.

It is common to observe ads popping up when accessing the internet. These ads are somewhat distracting especially when an individual is finding it difficult to access the desired material on the internet. Similarly, when the ads are clicked, one is redirected to another webpage that may not be relevant to the students' search. This is often the case when using unlicensed software which was the situation with most of the respondents.

One of the STREAM students stated that, "Erm', one of the major challenges I'm facing is too many ads popping up when accessing the internet; especially on YouTube, the ads are very annoying sometimes it pisses me off [makes me angry]. It wastes my time and data (P1)."

Another participant said, "Well, most of the applications, the ads on the application are too much which give hmm...which is not always easy to access because you might be listening to or reading a particular topic and an ad will just pop up and distracting you from what you are focusing on. Secondly

some of the ads may even give the system virus (P10).”

Figure 1. Word cloud showing the interview responses on the challenges faced by students in STREAM fields in accessing academic resources on the internet.

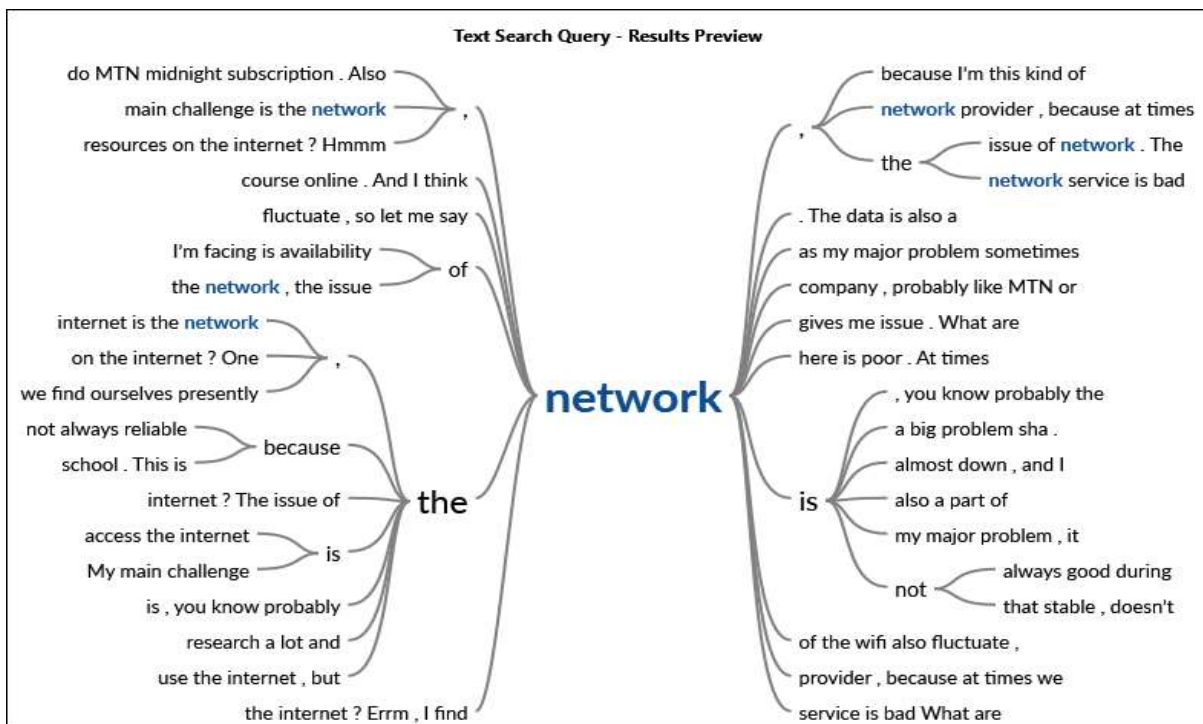
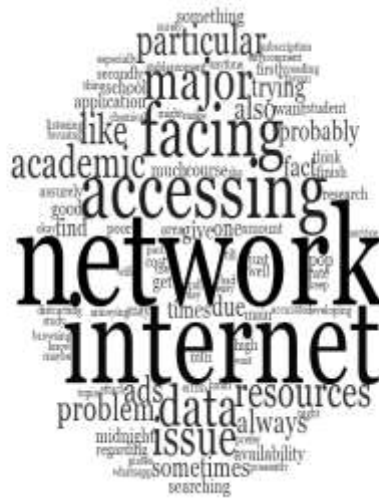


Figure 2. Word Tree of the challenges faced by students in STREAM-related fields in accessing academic resources on the internet.

Items clustered by word similarity

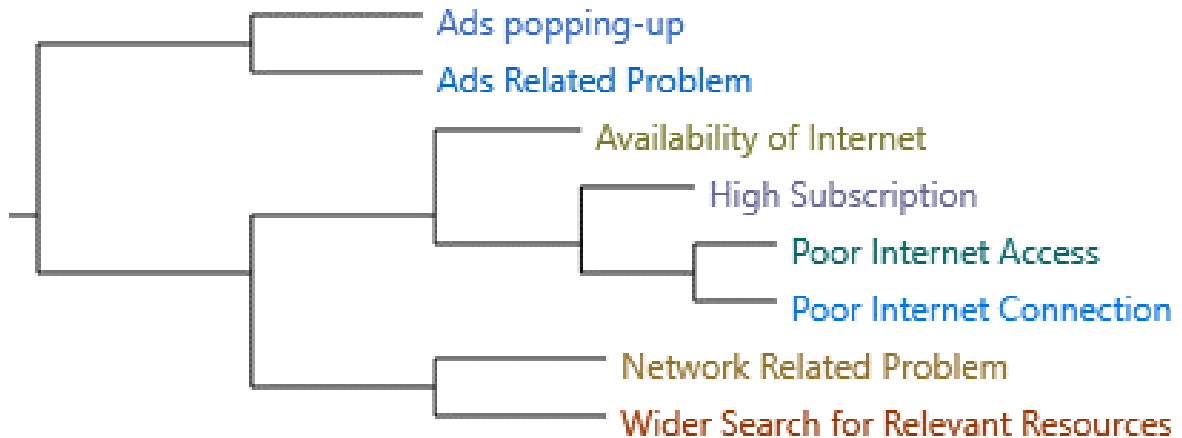


Figure 3. Cluster analysis of the challenges faced by students in STREAM-related fields in accessing academic resources on the internet.

FINDINGS AND DISCUSSION

Evidently, utilisation of the internet for academic purpose in and outside the classroom has been established in the literature to improve learning, learners' experiences and access to wide range of resources. This section discusses the result of this manuscript with respect to literary positions of scholars. Connection and speed of internet remain a concern in developing countries (Agbo & Igwebuikwe, 2016; Amaechi et al., 2022; Awoloye & Siyanbola, 2006; Fasae & Adeniyi, 2012). The slow speed of internet was among the challenges experienced by both undergraduate and postgraduate students in tertiary institutions across Nigeria (Ihuoma & Akande, 2020; Ogunbodede et al., 2020). Akin to this study is the observation of utilization of internet by students in STREAM education. Empirical data agree to previous position on poor connectivity and slow speed of internet. The implication of the afore said is that students may end up recycling existing resources without access to new knowledge, as a result, may not be kept abreast of evolving knowledge in their area of research which may render them globally uncompetitive with their peers with better access to the internet. While the situation has witnessed some improvement over the year, it may not be out of place to improve the speed and connectivity, especially for tertiary institutions across the country and by extension the continent.

Affordability as identified in this study is also a challenge for internet subscribers. Poverty eradication and reduction in inequality are goals 1 & 10 of the global effort for equity through Sustainable Development Goals (SDGs) of the United Nations (UN, 2015, 2023). Evident from the UNESCO 2017 report, poverty remains a challenge in developing countries (Oghogho, 2016; Ogunbeni et al., 2016; UNESCO, 2017). Pragmatically, food remains a priority over internet for students in developing countries, especially, where there are no scholarships and grants to subsidize students' education. STREAM fields enjoy subsidies in most developed countries, for equity, developing countries should also be supported to realise their career

aspirations. For STREAM students to compete, it is only realistic to subsidize their needs for career development. Important of these needs is affordable internet to connect and access qualitatively resources for their development, competence and competitiveness.

From the universities sampled and positions in the literature within Nigeria, it is arguable that public universities procure access to paid academic literature (Apuke & Iyendo, 2018; Badmus & Omosewo, 2020; Nwokedi, 2017; Ogungbeni et al., 2016). The implication of this is that only open access resources will be consumed by both undergraduate and postgraduate students in these universities. It is imperative to state that wide range of resources should be available to all students regardless of their level of education. However, postgraduate students in STREAM are more in need of quality internet resources. However, it could be argued that quality resources are also available in open access resources. For open access, filtering is mostly required to sieve for relevant information or knowledge to advance research as posited by students and by extension reviewed literature (Khuluqo et al., 2021; Pei & Wu, 2019). This laxity must be address by policy makers and head of institution for equitable education and inclusivity.

The outcome of the quantitative analysis indicates that the academic purpose for which the internet is frequently used among Undergraduate and Postgraduate students in STREAM fields is communication. This result agrees with the research findings of Agbo and Igwebuikwe (2016) and Apuke and Iyendo (2018) who reported that students mostly used the internet for communication. In addition, there is no significant difference in the level of usage of the internet for academic purposes among undergraduate and postgraduate students in STREAM fields. This may be because the students who participated in the study have an equal awareness of the application of the internet in their academic pursuits. Although, it is expected that students at postgraduate level are expected to have a higher level of internet utilisation compared to those at the undergraduate level, however, this current finding poses a challenge and calls for more research into the moderating variables that can influence the level of usage of internet among students.

Results show that the challenges faced by students in STREAM fields in accessing academic resources on the internet include Poor internet networks which aligns with the result of Agbo and Igwebuikwe (2016), Jibrin et al (2017), Ihuoma and Akande (2020), Ogunbodede et al., (2020) who reported poor internet connectivity as major challenge faced by students in tertiary institutions in and outside STREAM fields. The cost of internet in the developing countries is high as reported in this study and by Agbo and Igwebuikwe (2016), Oghogho (2016) Ogunbeni et al (2016). For developing societies, the standard of living is low with attendant consequence on the quality of internet especially at a rate that is not affordable to the habitants. Subsidised internet may go a long way in addressing the anomaly experienced. On wide search, the internet as a large encyclopaedia requires certain skill set to filter through a range of outcomes. Sticking to genuine software and using paid applications may assist in ameliorating the challenges of too many add pop-ups.

CONCLUSIONS

This study concludes that there is a growing thirst for fast and affordable internet among STREAM undergraduate and postgraduate students in STREAM fields. Evident from the findings, these categories of students frequently utilise internet for academic purposes. They utilized mobile apps, software, and website for accessing academic resources on the internet. The academic purpose for which students enrolled in STREAM fields require them to frequently use the internet to search and read online academic resources, listen to the educational discourse, watch instructional videos, download educational resources, upload educational content, scholarship search/application, academic research and communication. No significant

difference was found in the level of usage of the internet by both undergraduates and postgraduates for academic purpose in STREAM fields. The challenges experienced by students in STREAM fields in accessing academic resources on the internet included poor internet network, high cost of internet subscription, wide search for relevant academic resources and too many ads pop-up which distracts their search. The skill set to coherently navigate the internet appears to be inadequate among these students. Also, over-reliance on free application and non-genuine software resulted in unnecessary adverts and pop-ups which hinders their utilisation.

We recommend that university administration should prioritise students' development in the form of quality internet access, licensed software and access to paid academic resources. Furthermore, Government, policy makers and other stakeholders should subsidise the academic needs of students. Improving the quality of internet connection, making subscriptions more affordable and provision of licenses to application software utilised may assist STREAM students' development.

LIMITATION & FURTHER RESEARCH

We acknowledge that this study was carried out in two public universities in Nigeria. As such, the findings and conclusions in this study may not represent in entirety of the happenings across all public universities. Consequently, generalisation of the result, findings and/or conclusions may fall short of empirical realities in other universities. For a generalisable result, a wide sample will be required.

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