An Evaluation on The Knowledge and The Level of Internet Technology Usage Among Tertiary Students

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Abstract

There is less research conducted to evaluate how students have adopted these new technological developments (internet applications and services) in Ghana. The level and capacity of internet usage among students in Ghana differ significantly from that of students in the developed and underdeveloped countries. Therefore, this study is conducted to address these issues by filling the existing gaps by evaluating the knowledge and level of usage of internet technology among students of Presbyterian University College, Ghana. The study used a descriptive cross-sectional survey to assess the level of students' awareness of the internet services offered by the university. The different types of internet applications and search engines that the students use, the kind of activities students look for on the internet, students' skills in accessing the internet services, and the student's level of skill in evaluating/authenticating the internet content among university students. A disproportional stratified random sampling technique is used in selecting 297 students. The solution from this study revealed that the kind of activities students mostly used the internet for included social media networking, E-learning, discussions /newsgroup, assignments and research communication, recreational purposes, reading news items, streaming and downloading movies. Most respondents did not know or have any skill in evaluating/authenticating internet content. In contrast, a few understood and had some expertise in evaluating and validating the content on the internet.

1. Introduction

Studies show that over the past decade, educators have recognised that their integration of technology into education is one of the essential issues for educational reform and innovations [1].

The internet is a global system of connections that links millions of people publicly. It enables individuals and businesses to interact and share information, resources, and services. So, internet usage is an important tool in higher education where it has become a valuable source for students to get information [2].

a. Internet-based learning has received high praise from educators and researchers worldwide. It a believe that Internet-based instruction can provide learners with distant, interactive, individualised and inquiry-based learning activities and promote learners' knowledge construction and meaningful learning [3], [4]. Almost all the students at different school levels have certain experiences of using the internet. With the broad implementation of Internet-based learning instruction, these students may have more and richer Internet experiences in internet-based learning environments. However, studies about the fundamental nature of learners' Internet usage have not kept pace with their Internet usage [5]. Learners may perceive the internet differently when they use it, and these perceptions may shape the learners' attitudes and then the learners' online behaviours [4]. However, only scant attention has been paid to students' perceptions of the internet.

b. In Chou and Tsai [4] study, the author defined students' perceptions of the internet based on both an ontological approach and 4-T categories (namely, the four possible roles, Technology, Tool, Toy and Travel, that the internet may play), and thus interpreted learners' perceptions of the internet.

2. Statement of the problem

Diffusion, adoption and development of ICTs are emphasised to ensure that internet services are available to both students and staff of the university to enhance research, teaching and communication.

However, little has been done in terms of research to evaluate how students use the internet resources provided through the university library. It is often assumed that once internet services are made available, the students will be ardent users of these services to enhance their academic work [6]. Academic libraries, more especially university libraries, are faced with the challenge of meeting the information needs of their large number of students when they are supposed to read the same publications

 | DOI: 10.20533/licej.2040.2589.2022.0478

in their subject speciality. Printed sources are never enough due to the growing number of students. Students who search the internet for a specific subject speciality face a plethora of digital information that may not always be factually correct. Research indicates that although university students are technologically savvy, they may lack the information literacy skills of evaluating the authenticity of retrieved digital information. They do not use the services for academic work but rather for social communication and entertainment. Kamonde [6] in his study on Innovative Technologies for education and learning, observed that the most used internet application is e-mail, which is used mostly for social communication. Although the university Library subscribes to various licensed databases and online journals, which are significant sources of information for students, it is not always clear whether the students use them optimally for academic work. It is possible students do not perceive these licensed databases and internet sources as significant resources for their academic work and research.

There is less research conducted to evaluate how students have adopted these new technological developments (internet applications) at the Presbyterian University College, Ghana. Ghana is a developing country whose technological developments and advancements are different from the developed countries and underdeveloped countries. It means that the level and capacity of internet usage among students differ significantly from that of students in developed and underdeveloped countries. Therefore, this study has been conducted to address these issues by filling the existing gaps by evaluating the knowledge and level of usage of internet technology among students of Presbyterian University College, Ghana.

3. Specific objectives

- To ascertain the level of student's awareness of the internet services offered by the university.
- To assess students' skills in accessing internet services.
- To examine the level of skill of the student in evaluating/authenticating the internet content.

4. Research questions

- What is the level of students' awareness of the internet services offered by the university?
- What are students' skills in accessing internet services?
- What is the level of skill of the student in evaluating/authenticating the internet content?

5. Significance of the study

The findings at the end of the study will reveal whether or not there are adequate knowledge and level of internet and computer use among students in Presbyterian University College, Ghana. It will help policymakers draw up plans to improve the situations. It will also add to the body of knowledge on internet use among health students.

This study will serve as a reference point to the university, students, the Ministry of Health and the Ministry of Education in this case. Results from this study could be used in the intervention of the development of enablers and facilities that will promote internet use among student for positive information searching. Additionally, the study will contribute to the existing body of knowledge on the knowledge and usage of internet technology among students and stimulates further research on the subject.

6. Literature review

This section provides a review of previous literature in correspondence to the research topic as discussed below.

6.1. Internet

Since the mid-1990s, the internet has been rapidly increasing and transforming. There has been an increase in the chances of both adults and children to improve their social life, academic knowledge and other aspects of their life. It is rapidly penetrating the lives of young people in society. Individuals like teenagers use the internet for educational purposes and socialisation. Internet skills have become a critical advantage to an individual's performance and achievement in school and their place of work. Besides, young people who are deprived or lacking these skills and access are said to experience a setback when trying to make the most out of their education or career opportunities. Socially, teens and youths constantly communicate and interact through social networks (Twitter, Facebook, hi5) on different technological platforms such as phablets, game consoles, smartphones, and computers. All the devices and applications used in communicating require the internet to function.

Moreover, some social networks have in-built instant messengers that can allow the parties to communicate with each other, e.g., Facebook. Due to mobile devices and technological gadgets advancement, instant messengers (WhatsApp, BBM, Yahoo Messenger, Google Messenger) have been

 | DOI: 10.20533/licej.2040.2589.2022.0478

created on mobile platforms such as Android and RIM. Presently, some instant messengers can be used for a video conversation or voice messaging, e.g., Apple's FaceTime, Skype, Viber. Nevertheless, there have been critiques and arguments about the way students use the internet. Some have based their case on the addiction level of students when using the internet, while others have criticised the dependency level of students when accessing the internet.

The internet, also known as the Net for short, began as an idea in 1962. It can be described as "a network of networks linked by several layers of protocols". In contrast, some define the internet as a developing universe with millions of computers connected by one common network protocol and user interface. In 1969, the word internet made its way into computing when Transmission Control Protocol/Internet Protocol was introduced to allow interactions of computer networks. It led to the Domain Name System (DNS) and the accessibility of data and programs on the internet through the File Transfer Protocol (FTP) system. It can also be referred to many things simultaneously, and this is because it can be used for a large variety of items that can all be processed simultaneously. Over the years, the internet has expanded to make accommodation for new applications that would run using the internet. From the early 1990s to date, the most prevalent and the most evident form is e-mail. The Simple Mail Transport Protocol (SMTP), which runs over TCP/IP, is considered to be very dependable because the information is transferred asynchronously in a "store and forward" manner between mail servers. If the server isn't working, the message will line up for later delivery. Also, Internet Service Providers (ISP) have the opportunity of providing instant messaging (I.M.) among users who use their services. Although I.M. is not e-mail, it provides a similar function of providing the users with immediate message delivery.

6.2. Knowledge and perception of internet use among students

In a study of Omani university students, Asan and Koca [7] found that most students had positive attitudes, and they concentrated on positive and consciousness about the internet. A significant percentage of students thought that the internet is a universal digital library, provides an easy life, and is the fastest way to reach knowledge.

Rajani and Chandio [8] surveyed a sample taken from Pakistani teens, adults and senior citizens of different professions like teachers, doctors, students, organisers, employed and unemployed, both males and females. The results suggest that majority of the users agreed with the potential of the internet as an informative source for the general public and realise the effort involved in effectively utilising this valuable resource.

Learners may perceive the internet differently when they use it, and these perceptions may shape the learners' attitudes and then the learners' online behaviours [4]. Their study also identified students' perceptions of the internet based on both an ontological approach and 4-T categories (namely, the four possible roles, Technology, Tool, Toy and Travel, that the internet may play). Students in the Technology category are inclined to view the internet as a technical product that enhances the living environment. Moreover, students in the Toy category tend to perceive the internet as a source of pleasure, especially online games. In contrast, students in the Travel category tend to view the internet as a source of tours or a means of navigation.

6.3. The benefits of the internet to the health of students

Internet use is spreading rapidly into daily life and directly affecting people's ideas and behaviour. The internet has an impact in many areas, including the higher education system. Internet heralded the development and implementation of new and innovative teaching strategies in higher education institutions. Educators who advocate technology integration in the learning process will improve learning and prepare students to participate in the 21st-century workplace effectively. Internet use has become a way of life for the majority of higher education students all around the world. For most college students, the internet is a functional tool that has greatly changed the way they interact with others and information as they go about their studies. They use computers to accomplish a wide range of academic tasks. Many students prepare course assignments, make study notes, tutor themselves with specialised multimedia, and process data for research projects. Most exchange e-mails with faculty, peers, and remote experts. They keep up-to-date in their fields on the internet, accessing newsgroups, bulletin boards, listservs, and websites posted by professional organisations. Most access library catalogues, bibliographic databases, and other academic resources in text, graphics, and imagery on the World Wide Web [7].

Suhail and Bargees [9] surveyed the Internet use pattern of 200 undergraduate students of the Government College University, Lahore. The study aimed to investigate the positive and negative effects of excessive Internet use on undergraduate students. It discovered that most of the students used the internet for enhancing their academic skills and achievements.

 | DOI: 10.20533/licej.2040.2589.2022.0478

The majority of the students reported positive than adverse effects of Internet use. The results indicated that a great majority of the students (84%) found the internet helpful for worldwide communication; 78% reported that Internet use helped improve their grades; 74% agreed that their reading, writing, and information processing skills had expanded using the internet. Another 48% reported that they had become better students by using the internet.

Under constant demands to improve the quality of higher education within an increasingly digital world, technology is often seen to increase learning and collaboration on college campuses. The current generation of college students has grown up with technology, and these students are among the earliest adopters of new advances in technology. Allowing students to connect to their campus community, collaborate with peers, acquire further information, and demonstrate their learning through technology is essential for college campuses seeking to meet the needs of today's college students. Although access and use of technology are highest in traditional-age college students, disparity still exists in who uses technology and what age they are exposed to [10].

Currently, this internet is transforming all facets of human life since it became globally accessible to the public in the 1990s. This transformation is evidenced by the rising number of internet users globally. According to the 2009 Computer Industry Almanac, the worldwide number of internet users surpassed one billion in 2005 (up from 45 million in 1995 and 420 million in 2000). It has become a powerful means of information transmission and has been embraced by academic institutions to enhance research and academic work. Luambano and Nawe [11] confirm that the internet has become an essential component of educational institutions as it plays a pivotal role in meeting the information needs of these institutions. They sum up the importance and benefits of the internet as:

- It increases access to information all over the world.
- It provides scholars and academic institutions with an avenue to disseminate information to a wider audience worldwide.
- It enables scholars and students at different locations on the globe to exchange ideas on various fields of study.
- It has enabled the growth of distant learning, both within nations and across international borders.
- It provides students and lecturers with a communication system that they can use to communicate with each other irrespective of distance.

6.4. Awareness of internet services

According to the Collins English dictionary (2009), "awareness" means knowledge of the existence of something. It follows then that awareness of internet services means knowing the services and resources available on the internet and conversing with what institutions offer in terms of these services. When the user is aware of a resource or a service, it will lead to more use of the service or resource.

College students use the internet more than any other population group, and most students reported that they had been introduced to the internet by friends or family members. In contrast, others had learned about it through self-initiative [12].

Badu and Markwei [13] revealed that the knowledge of internet services among the respondents was universal, with 99, 2% of the respondents indicating that they were well aware of the internet. The results of the study also showed that e-mail was the most popular service among the staff and students, followed by the WWW, discussion groups, Usenet News and FTP in descending order. Telnet, Gopher and WAIS were not well known among the respondents. At the same time, Parameshwar and Patil [14] showed that the faculty members had a long experience using the internet than the research scholars. The use of technical reports and electronic theses and dissertations was limited due to a lack of awareness by research scholars and students. Even though all the respondents indicated that they were aware of internet services, the results revealed that not all were aware of the different resources available on the internet or the internet techniques and related applications of the internet.

6.5. Students' skills and knowledge in accessing internet services

One cannot access internet-based resources without adequate internet skills. Student's ability to find and retrieve information effectively is a transferable skill that will also be useful in their future lives; it also enables the positive and successful use of e-resources while they are at school. These authors note that any student at a higher level of education who intends to achieve should have the ability to explore the digital environment in this digital era. Students are expected to use electronic information at university. To use the internet resources, students must acquire and practise the skills necessary to exploit them [15].

These skills include:

- Knowledge of the structure of the databases
- Knowledge of the instructions they must enter into the computer

 | DOI: 10.20533/licej.2040.2589.2022.0478

- To understand how these instructions are linked to one another.
- Acquiring these skills is essential in a technology-driven environment, and they can be enhanced tremendously through initiative learning strategies

Hinson and Amidu's study [16] showed that a lack of electronic literacy skills among final-year students at Ghana's oldest business school was a significant obstacle in using internet resources. A total of 48% of the respondents indicating that they lacked the necessary skills to access internet resources.

6.6. The use of different types of internet applications

There are many surveys on the use of the internet, and nearly all find that internet use is most prevalent among the young and the more educated people. They reported that service is affected by the presence or absence of a computer in the home of origin [17].

Stern's study [18] was on the information competence of incoming students into universities and how they use the internet for general and academic research. Students used the internet for course-related research. Eighty per cent of students used the internet at their homes, followed by computer labs at the campus. Most of the students admitted that they learnt using the internet by themselves or through family and friends.

Odell et a. [19] studied Internet use among female and male college students at institutions of higher learning in Georgia, Hawaii, New Jersey, Massachusetts and Rhode Island. They found that while the gap in use of the internet has nearly closed, there remain differences in how male and female undergraduates use the internet.

In a survey of Internet usage of the students of an American agricultural college, Rhoades et al. [20] found that most of them used the internet at their homes and used a search engine when online. The majority of students tended to indicate seeing the internet as good, easy to understand, important, beneficial, believable, credible, and accurate.

Rajani and Chandio [8] surveyed a sample taken from Pakistani teens, adults and senior citizens of different professions like teachers, doctors, students, organisers, employed and unemployed, both males and females. The results suggest that majority of the users agreed with the potential of the internet as an informative source for the general public and realise the effort involved in effectively utilising this valuable resource. The study also revealed that the students used the internet for educational purposes.

7. Methodology

This study used a descriptive cross-sectional survey that assesses the knowledge and usage of internet technology among students. It also analyses the level of students' awareness of the internet services offered by the university, and the kind of activities students look for on the internet. The study identifies students' skills in accessing the internet services and the student's level of expertise in evaluating/authenticating the internet content among students of Presbyterian University College, Ghana. A disproportional stratified random sampling technique was used in selecting 297 students. A questionnaire was used as a data collection tool and was administered to a sample size of 297. Data were analysed using SPSS (Statistical Package for Social Sciences) version 24.0.

8. Results

The analysis of the study takes into consideration the objectives of the study. It presents the results of the investigation.

8.1. The level of student's awareness of the internet services offered

Table 1 depicts information on students' awareness of the internet services offered by the university. On knowledge of internet services, the majority (93.9%) of the respondents were aware of the internet services provided by the university, while 6.1% were not. It showed that respondents were aware of the internet services offered by the university.

Table 1. Students' awareness of the internet services offered by the university

Variables	Frequency	Percentage (%)
Awareness of the internet services offered by the university		
Yes	279	93.9
No	18	6.1
Total	297	100.0
Access to internet facilities		
Yes	261	87.9
No	36	12.1
Total	297	100.0
If yes, where do you have access to the internet		
On campus (in the open)	154	59.0
Hostel	48	18.4
Lecture Hall	29	11.1
Library	18	6.9
Computer lab	12	4.6

 | DOI: 10.20533/licej.2040.2589.2022.0478

Total	261	100.0
Ways to access the internet in the university		
Wi-Fi	101	34.0
Mobile data	78	26.3
Modem	112	37.7
Hotspot Device	6	2.0
Total	297	100.0

Concerning access to the internet facility, a majority (87.9%) of the respondents had access to the internet facilities, whereas only 12.1% indicated they did not have access to internet facilities. It revealed that most students had access to internet facilities.

Out of the 261 respondents who had access to the internet facilities, a majority (59.0%) accessed the internet on campus (in the open), 18.4% accessed it from their hostel, 11.1% accessed it from the lecture hall, 6.9% accessed it at the library, and 4.6% obtained it at the computer lab. The result showed that respondents had access to the internet in the open on campus, hostel, lecture hall, library, and computer lab.

Furthermore, 37.0% of the respondents said they use a modem to access the internet, 34.0% used Wi-Fi, 26.3% used their mobile data, and 2.0% used Hotspot devices. It means that respondents used the modem, Wi-Fi, mobile data and the hotspot device to access the internet in the university.

8.2. Students' skills in accessing the internet services

Table 2 shows students' skills in accessing internet services. It was revealed that 36.0% of respondents said they were very good with basic skills, 34.0% said they are good, 20.2% fair, 6.1% poor, and 3.7% very poor. The result showed that respondents were very good with basic skills like typing and word processing.

Using a search engine, 36.0% of respondents said they were very good using a search engine, 36.0% said they are good, 20.2% said fair, 5.7% said very poorly, and 2.0% said poor. It indicates that students were very good at using a search engine.

On information gateways, 38.4% of the respondents said they were good using information gateways, 27.6% said they are very good, 16.2% said poor, 15.8% said fair, and 2.0% said very poorly.

Table 2. Students' skills in accessing the internet services

Variables	Frequency	Percentage (%)
Basic skills (e.g. typing and word processing)		
Very poor	11	3.7
Poor	18	6.1
Fair	60	20.2
Good	101	34.0
Very good	107	36.0
Total	297	100.0
Using search engine		
Very poor	17	5.7
Poor	6	2.0
Fair	60	20.2
Good	107	36.0
Very good	107	36.0
Total	297	100.0
Using information gateways		
Very poor	6	2.0
Poor	48	16.2
Fair	47	15.8
Good	114	38.4
Very good	82	27.6
Total	297	100.0
Evaluating websites for relevance		
Very poor	18	6.1
Poor	66	22.2
Fair	60	20.2
Good	113	38.0
Very good	40	13.5
Total	297	100.0
Web navigation		
Very poor	36	12.1
Poor	30	10.1
Fair	78	26.3
Good	94	31.6
Very good	59	19.9
Total	297	100.0
Browsing		
Very poor	11	3.7
Poor	6	2.0
Fair	6	2.0
Good	83	27.9
Very good	191	64.3
Total	297	100.0

Concerning evaluating websites for relevance, 38.0% of the respondents said they were good at evaluating sites for relevance, 22.2% reported poor, 20.2% said fair, 13.5% said very well, and 6.1% indicated very poorly. It suggests that students were good at evaluating websites for relevance.

However, 31.6% of the respondents said they were good in web navigation, 26.3% said fair, 19.9% said very well, 12.1% said very poorly, and 10.1 said poor. It was noted that students are good at web navigation; again, the majority (64.3%) of the respondents said they were very good at browsing, 27.9% said well, 3.7% said very poorly, 2.0% said poor, and 2.0% said fair. These showed that students were very good at browsing.

8.3. Level of skill of the student in evaluating/authenticating the internet content

Table 3 shows that the majority (89.9%) of the respondents indicated no, they did not know or have

 | DOI: 10.20533/licej.2040.2589.2022.0478

any skill in evaluating/authenticating the internet content. In comparison, 10.1% indicated they knew or had any skill. Therefore, it was noted that respondents do not know or have any skill in evaluating/authenticating the internet content.

Table 3. Level of skill of the student in evaluating/authenticating the internet content

Variables	Frequency	Percentage (%)
Do you know or have any skill in evaluating/authenticating the internet content		
Yes	30	10.1
No	267	89.9
Total	297	100.0
If yes, how		
Creating blogs	6	20.0
Connecting more computer to a network	12	40.0
Internet security	6	20.0
Browsing the right website	6	20.0
Total	30	100.0

Out of the 30 respondents who knew or had any skills in authenticating the internet, 40.0% had skill in connecting more computer to a network, 20.0% had a skill of creating blogs, 20.0% had a skill of internet security and 20.0% had a skill of browsing the right website. These revealed that the few respondents who knew or have a skill of evaluating/authenticating the internet content knew of connecting more computers to a network, internet security, browsing the right website and creating blogs.

9. Discussions

The analysis of the study takes into consideration the objectives of the study. It presents results and discussions of the study.

9.1. The level of student's awareness of the internet services offered

Table 1 results are in line with Badu and Markwei [13], which revealed that the knowledge of internet services among the respondents was universal, with 99, 2% of the respondents indicating that they were well aware of the internet. Contrary to this finding, Hinson and Amide's study [16] stated that the level of awareness of the internet was low among students.

Concerning access to the internet facility, it is similar to Badu and Markwei [13] showed that access to internet services among the students was widespread as the student had access.

The result showed that respondents had access to the internet in the open on campus, hostel, lecture hall, library, and computer lab. They use the modem, Wi-Fi, mobile data and the hotspot device to access the internet in the university

9.2. Students' skills in accessing the internet services

Concluding the findings in Table 2, respondents were very good with basic typing and word processing skills. In using a search engine, students were very good at using search engine. On information gateways, students were good at using information gateways. Concerning evaluating websites for relevance, students were good at evaluating sites for relevance. It was noted that students are good at web navigation and students were very good at browsing.

These are consistent with Okello-Obura and Magara [15] to make use of the growing range of internet resources, students must acquire and practice the skills that are necessary to exploit them, which includes knowledge of the structure of the databases, basic skills like typing and word processing, etc. It also contradicts Hinson and Amidu [16], which showed a lack of electronic literacy skills among final-year students in Ghana, which is a great obstacle in using internet resources.

9.3. Level of skill of the student in evaluating/authenticating the internet content

From Table 3 it was noted that respondents do not know or have any skill in evaluating/authenticating the internet content. It was further discovered that the few respondents who knew or had the skill of evaluating/authenticating the internet content knew how to connect more computers to a network, internet security, browsing the right website and creating blogs.

This finding conforms with Stern's [18] on the information competence of incoming students into universities and how they use the internet for general and academic research. Students used the internet for course-related research.

This finding is contrary to Tadasad et al. [10] findings, which showed that students lacked the skills in evaluating/authenticating the internet content.

10. Conclusion

The purpose of the study was to evaluate the knowledge and the level of usage of internet technology among university students in Ghana. Most of the respondents were aware of the university's

 | DOI: 10.20533/licej.2040.2589.2022.0478

internet services and had access to the internet facilities. Students accessed the internet mainly on campus (in the open); some accessed it from their hostel, lecture hall, library, and computer lab. Also, students used modem, Wi-Fi, their mobile data and Hotspot devices to get access to the internet. The different types of internet applications and search engines that the students used were the World Wide Web, the E-mail, E-journals/E-book, the opacs and discussion list/Newsgroup. All respondents used search engines to find information from the internet and preferred to use Google search engines.

Activities students mostly used the internet for included social networking, E-learning, discussion list/newsgroup, assignments and research communication, recreation, reading news, and watching and downloading videos. Respondents were very good with basic skills like typing and word processing, in using a search engine, in using information gateways, in evaluating websites for relevance, web navigation and browsing, downloading and saving information, in printing, in searching for information, good in using search strategies and in using databases.

Most respondents did not know or have any skill in evaluating/authenticating the internet content. The few respondents who knew or have the skill of evaluating/authenticating the internet content have skills in connecting more computers to a network, internet security, browsing the right website and creating blogs.

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