



Trends in the Use of Wireless Fidelity on Campus among Undergraduates in Usmanu Danfodiyo University, Sokoto

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Abstract

This study investigates the trends in the use of wireless fidelity (Wi-Fi) on campus among undergraduates in Usmanu Danfodiyo University, Sokoto (UDUS). Four objectives were formulated at the onset of this study. Survey research design was adopted, and simple random sampling technique was used to select three hundred and ninety-six (396) students as sample using questionnaire as instrument for data collection. It was found that undergraduate make use of wireless fidelity available to them basically for academic purposes. Amount of time students spend carrying textbooks is reducing drastically because of access to wide variety of materials on the internet through Wi-Fi. Also, abuse of the wireless fidelity (Wi-Fi) for illicit purpose is low based on the findings of the study. It was also found that some students don't have access to internet enabled devices. Usage of wireless fidelity has positively influenced the undergraduates' academic performance. The students faced a lot of challenges such as power failure; low internet bandwidth; poor computer operating skills; unreliability of internet connection and small area coverage. Hence, the study concluded that there is a healthy usage of wireless fidelity on campus by undergraduates in the Usmanu Danfodiyo University, Sokoto. Thus, it was recommended among others, that management of UDUS should increase their broadband network in order to enable the students have free flow of information access on the internet.

Keywords: Education, Wireless Fidelity, Campus, and Internet.

Introduction

The world has experienced a technological revolution that has emerged rapidly in all fields including education field. The advent of information and communication technology (ICTs) in higher education and the remarkable development of their uses have completely revolutionized the relationship between knowledge and the pedagogical practices. This idea has been confirmed by United Nations, Educational, Scientific and Cultural Organization UNESCO (2016) who clearly stated that ICT in the education programme focuses on the potential of ICT in achieving quality education for all. Yusuf (2010) identified that Nigeria, being a developing country with an emerging thrust in technology and gradually deploying technology because of its prowess, has failed to consider evaluating the impact of technology on the system it is deployed for. The academic community has undergone profound transformation during these years, assuming new dimensions influenced by technology-driven applications. The internet is a priceless source of information for students and a tool to enhance their productivity (Kirschner & Karpinski, 2010). This has made students to be heavy users of the Internet compared to the general public (Judd & Kennedy, 2010). This is why many universities now make provision for internet facility within the campus premises.

Adekunmisi *et al* (2018) reported that access to internet by university students impacts education in a positive way by increasing communication with classmates and professors, increasing access to libraries and educational databases, and improving study hours and study habits. However, despite the positive impact of the internet on academic performance, Akhter, (2018) found that excessive internet usage adversely affects one's physical health, family life and academic performance. Some literature shows that internet usage is on the increase from the adolescent to undergraduate students (Kunnuji, 2019). It was also revealed that these groups of users harness the benefits embedded in making use of Internet facilities such as Wi-Fi (Ofodu, 2012; Udende, 2010). Alshammari (2016) confirms that there is a huge number of learning materials embedded on the internet and the students can get a quick access to the information.

Recently, deep-seated changes have been witnessed in the structure and functions of higher institution of learning by the advent of information and communication technology (ICT) with the aid of computers that store, retrieve and process information as well as the Internet that connect computer and people together (Ilo & Ifijeh, 2010). According to Nguyen *et al* (2012), the term 'ICT' can be defined as "forms of technology which can be used for creating, displaying, storing, manipulating,



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and exchanging information”. ICTs can also be described as computer-based technologies such as desktops, laptops, tablets, smartphones, and software and internet-based technologies including email, websites, and social networking sites which can be used for teaching, learning, and for other things.

Wireless fidelity often known as Wi-Fi, according to Bakare and Minah-Eeba (2018) is the technology that allows a personal computer (PC), laptop, mobile phone, or tablet device to connect at high speed to the internet without the need for a physical wired connection. The technology uses radio signals to transmit information between Wi-Fi enabled devices and the internet, allowing the device to receive information from the web in the same way that a radio or mobile phone receives sound. The internet usage has grown rapidly during the last decade in almost every country in the world and in Nigeria specifically which makes millions of individuals in the country to be connected to a global network. Almarabeh *et al* (2016) asserts that internet has become the backbone of the information economy. Internet is now being used by individuals and group of people in many sectors like education and communication.

The internet according to Adomi (2017) is very important to Nigerian university students in helping them to have access to timely, accurate and relevant information. Internet has brought a great change in the education sector in terms of teaching and learning unlike in the olden days. Alshammari (2016) confirms that there is a huge number of learning materials embedded on the internet and the students can get a quick access to the information. This is because the world is now on “palms”, and this was why Buhari (2018) posits that the internet is one of the recent advancements in the world of technology and it became useful instrument that has fostered process of making the world a global village. The internet is a platform that serves as global reservoir of knowledge for researcher and students to share common knowledge in a diverse way, they have often taken advantage of the virtual library to publish, interact and share findings (Hassan & Jacob, 2012).

Wi-Fi hotspots offered free of charge in public places that anyone could use to access the internet (Powell, 2018), thereby allowing the students access all the electronic information needs. The presence of Wi-Fi within a define range of hotspot enables the student to avoid the trouble of accessing information through the cable LAN which restricts the student from mobility, as Wi-Fi is proving to be the default internet access technology. Given the widespread adoption of mobile technology among students, combined with increased possibilities for network access (such as Wi-Fi connections in classrooms and across university campuses), and extended battery life, it is understandable that more and more students bring laptops to the classroom. In this sense, the students themselves make computers an important part in their educational activities. Ogunlade *et al* (2018) in their study revealed that majority of students had a positive attitude towards the use of internet facilities, and they believe internet facilities could generally provide better learning experience.

Salaam and Adegboro (2010) studied the internet access and use by students at private universities in Ogun State revealed that internet facilities are available in all the private universities studied. In the same vein, Fasae and Aladeniyi (2019) conducted a study on internet use by students of faculty of science in two Nigerian universities; they found out that majority of the science students use the internet for educational purposes. However, the impact of internet usage on academic performance was studied by Osunade *et al* (2018) using two universities as case study. The contact group did not have access to internet, while the experimental group had access to internet. The result showed a significant difference between the academic performances of the two groups. Additionally, Anasi (2016) investigated the pattern of internet use by undergraduates at the University of Lagos, main campus, Akoka, Lagos. The study discovered that even though the level of internet use was low among undergraduates from both the faculty of law and education. Further, it showed that internet use has a very high impact on the academic/career related activities of the students.

Studies by Sahin (2010) revealed that the internet has many benefits to the academic cycle; these include provision of round-the-clock access to a wide variety of information sources globally and the ability to discuss and share experience with colleagues to be able to derive maximum benefits from the attributes of ICT. Ugwulebo and Okoro, (2016) further submitted that the internet is a valuable source of information used by student in projects and assignments. With over 50million websites on the net, the chances are that information on any subject however obscure can be found using appropriate search tools. It also serves as a useful tool for lecturers in helping to prepare lesson plans using a number of sites dedicated to providing educational material. There are great possibilities for higher education at all levels through the use of internet because curricula can be developed collaboratively and educational materials distributed and updated more cheaply, offering additional ways for students to interact with their study materials as well as their instructors.

Notwithstanding, Paul *et al* (2012) asserts that time spends on online social networks pose significant negativity on academic performance of the students. This view was further supported by Kirschner and Karpinski (2010) saying that, excess involvement or obsession with social networking by students can have negatively impact on their academic performance. Similarly, Mohammed *et al* (2017), measured problems of students in using internet services, the study gathered that majority



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of the respondents indicated the problem of power failure, some reported the problem of slow internet speed and poor computer skills, while few reported problem of inadequate numbers of personal computers. Their finding is similar to that of (Quadri, 2013, Shehu, Urhefe & Promise, 2015). Rosenberg (2015) also observed that speed and reliability of internet connection is a major challenge faced by students in retrieving resources. Similarly, Luambo and Nawe (2014) reveal that the slow internet connections attributable to small bandwidth is also a major factor hindering internet access and use in Africa.

A survey conducted by Englander *et al* (2010) showed a negative relation between the amount of time spent on the internet per week and student's exam performance in a micro-economic class. In 2019, Smith and Salaway (2019) gathered that majority of all higher education students owned a laptop computer. This percentage may not be the same in UDUS but quite a number of students own a laptop computer. Since many universities like UDUS offer ubiquitous access to the internet, a laptop computer allows students to research, collaborate, and collect information almost anywhere within the university environment including the classroom (McCrea, 2010).

In UDUS, the entire university community has access to this wireless fidelity. The goal of which is to create an ICT proficient environment to aid the objective of the institution. It was gathered that this facility is available in selected nook and cranny of the university campus, thus there is a wide access and utilization of this internet facility by the students as access to the wireless fidelity helps in facilitating free flow of communication among the students, improve research proficiency of students and faculties at large. However, some students go to the extreme by taking advantage of this facility to download and watch movies ranging from TV series to pornography and music videos, gaming and entertainments etc., as a matter of fact it was observed that many students overstayed in the library or any other location where internet is available just to take advantage of good internet bandwidth. The rhetoric question is, could it mean that utilization of the wireless fidelity for other activities not captured within their academic curriculum implies that the essence of the wireless fidelity has been defeated? or does the fact that there is a huge rate of acceptability and utilization of the wireless fidelity mean it is being used for the original purpose by the students. Based on the foregoing, the study seeks to investigate the trends in the use of wireless fidelity (Wi-Fi) on campus among undergraduates in Usmanu Danfodiyo University, Sokoto (UDUS).

Objectives of the Study

The major aim of this study is to investigate the trends in the use of wireless fidelity (Wi-Fi) on campus among undergraduates in Usmanu Danfodiyo University, Sokoto (UDUS). The specific objectives are to:

1. find out the relevance of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto;
2. ascertain the frequency of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto;
3. investigate the impact of the usage of wireless fidelity on academic performance of undergraduate students in Usmanu Danfodiyo University, Sokoto;
4. determine the challenges of using wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto;

Research Questions

1. What is the relevance of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto?
2. What are the frequencies of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto?
3. What are the impacts of the usage of wireless fidelity on academic performance of undergraduate students in Usmanu Danfodiyo University, Sokoto?
4. What are the challenges of using wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto?

Methodology

Survey research design was adopted, and simple random sampling technique was used to select three hundred and ninety-six (396) students as sample using questionnaire as instrument for data collection. The population for the study covered undergraduate students across the fifteen (15) faculties in Usmanu Danfodiyo University, Sokoto (UDUS). The estimated number of students in UDUS is 19,481 as at 2023/2024 academic session. In order to determine the required sample for the population, Slovin's Formula was used to compute the sample size. The simple random sampling technique gave equal chance to the respondents (undergraduates) across the faculties in the university to be selected for the sample. The demographic variables of the study cut across departments such as library and information science, veterinary science, geography, agriculture and mass communication departments with academic level from 100-500 level, both males and female respondents, age range between 15yrs to 30yrs. Descriptive analysis including relative frequencies and percentages were used with the Statistical Package for Social Sciences (SPSS) computer software for analysis.



Results

Research Question 1

What is the relevance of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto?

Table 1: Frequencies and mean scores on relevance of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto (N=396)

ITEMS	No		Yes		Mean
	Freq.	%	Freq.	%	
Academic purpose	47	11.9%	349	88.1%	.53
Mails	129	32.6%	267	67.4%	.67
Education and Research purposes	87	22.0%	309	78.0%	.78
Fun	63	15.9%	333	84.1%	.84
Communication purposes	114	28.8%	282	71.2%	.71
Sports and game information	188	47.5%	208	52.5%	.53

(Source: Field-Data, 2023)

More than half of the respondents use the Wi-Fi for academic purposes ($\bar{x}=0.53$); Majority of them ($\bar{x}=0.67$) use it for mails; a considerable high number of them use it for education and research purposes ($\bar{x}=0.78$); Almost all of them use it for fun ($\bar{x}=0.84$); Many of them use it for communication ($\bar{x}=0.71$); while slightly above half of them use it for sports and game information ($\bar{x}=0.53$).

Research Question 2

What are the frequencies of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto?

Table 2: Frequencies and mean scores of use of wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto (N=396)

ITEMS	1	2	3	4	Mean	SD
Academic purpose	22	79	165	130	3.02	.867
	5.6%	19.9%	41.7%	32.8%		
Mails	6	34	192	164	3.30	.688
	1.5%	8.6%	48.5%	41.4%		
Education and Research purposes	43	103	145	105	2.79	.958
	10.9%	26.0%	36.6%	26.5%		
Fun	68	64	117	147	2.87	1.098
	17.2%	16.2%	29.5%	37.1%		
Communication purposes	75	115	148	58	2.48	.961
	18.9%	29.0%	37.4%	14.6%		
Sports and game information	113	68	111	104	2.52	1.161
	28.5%	17.2%	28.0%	26.3%		

(Source: Field-Data, 2023)

Table 2 shows the frequency of use of wireless fidelity by undergraduates in UDUS. All the items in this category receive more frequent usage by the undergraduates because most of them use the Wi-Fi for several purposes if not every day at least occasionally. $\bar{x}=3.02$, $SD=0.867$ indicates that most of the undergraduate make use of the wireless fidelity frequently for academic purposes. The frequency at which they use it for other purposes include; Mails ($\bar{x}=3.30$, $SD=0.688$); Education and Research Purposes ($\bar{x}=2.79$, $SD=0.958$); Fun ($\bar{x}=2.87$, $SD=1.098$); Communication purposes ($\bar{x}=2.48$, $SD=0.961$) and Sports and Game information ($\bar{x}=2.52$, $SD=1.161$).

Research Questions 3

What are the impacts of the usage of wireless fidelity on academic performance of undergraduate students in Usmanu Danfodiyo University, Sokoto?



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Table 3: Frequencies of impacts of the usage of wireless fidelity on academic performance of undergraduate students in Usmanu Danfodiyo University, Sokoto (N=396)

ITEMS	No		Yes		Mean
	Freq.	%	Freq.	%	
Using the wireless fidelity has increased my information quotient	35	8.8%	361	92.1%	.91
Increased my studying habits	220	55.6%	176	44.4%	.44
Improved access to quality information	87	22.0%	309	78.0%	.78
Through the Wi-Fi I have access to a wide variety of material on any topic	47	11.9%	349	88.1%	.88
Improved frontiers of knowledge	74	18.7%	322	81.3%	.81

(Source: Field-Data, 2023)

As shown in Table 3, there are 5 items used to evaluate the impact of usage of wireless fidelity on academic performance of undergraduates. It was gathered that usage of Wi-Fi has improved the information quotient of the respondents with mean value 0.91. However, more than half of the respondents (55.6%, $\bar{x}=0.44$) indicated that the use of Wi-Fi has reduced their study habit. Majority of them ($\bar{x}=0.78$) also noted that they have improved access to quality information through Wi-Fi. Similarly, almost all of them ($\bar{x}=0.88$) indicated that through Wi-Fi, they have access to a wide variety of materials on any topic. And lastly, a number of the respondents ($\bar{x}=0.81$) indicated that usage of Wi-Fi has improved their frontiers of knowledge.

Research Question 4

What are the challenges of using wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto?

Table 4: Frequencies of the challenges of using wireless fidelity on campus by undergraduates in Usmanu Danfodiyo University, Sokoto (N=396)

ITEMS	No		Yes		Mean
	Freq.	%	Freq.	%	
Limited internet enabled devices	25	6.3%	371	93.7%	.94
Power failure	39	9.8%	357	90.2%	.90
Poor computer operating skill	201	50.8%	195	49.2%	.49
Unreliability of internet connection	188	47.5%	208	52.5%	.53
Low bandwidth	11	2.8%	385	97.2%	.97
Small area coverage	64	16.2%	332	83.8%	.84

(Source: Field-Data, 2023)

Table 4 shows the various challenges faced by the undergraduates across the five selected departments in UDUS. All the items in this category were agreed to be a challenge faced by the students except poor computer operating skill which more than half of the respondents ($\bar{x}=0.49$) indicated that it is not a challenge. The specific challenges faced by the students are limited internet enabled devices ($\bar{x}=0.94$); Power failure ($\bar{x}=0.90$); Unreliability of internet connection ($\bar{x}=0.53$); Low bandwidth ($\bar{x}=0.97$) and small area coverage ($\bar{x}=0.84$). Apart from the structured question in this category, the respondents were given the opportunity to indicate other challenges they faced using an open-ended question type. Other challenges indicated by the respondents through open-ended questions are broadband network is only available in limited locations.

Discussion of Findings

Demographically, majority of the respondents are drawn from library and information science followed by geography, mass communication, agriculture, and veterinary science department respectively. Also, respondents in 300level make up the large number of the sample followed by those in other levels. The few ones in 500level are students from the department of Agriculture. Furthermore, the study revealed that more of the respondents are male while the rest of them are female in which many of them are those between 21 to 30years, very few are less than 20years and some are also slightly above 30years. This implies that majority of the respondents are still very young.



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Findings of this study in respect to first research question show that undergraduates in UDUS make use of internet facility for several purposes checking mails and academic purposes are predominant. This corroborates the findings of Udende and Azeez (2010) who reported that most students of universities admitted that they mostly use the internet for academic purpose and for mails. Other purposes of using wireless fidelity as indicated by the respondents include; education and research purpose, fun, communication purposes, sports and game information.

The result gathered on the frequency of use of Wireless Fidelity by undergraduate revealed that undergraduates in the UDUS observe a frequent use of the wireless Fidelity available to them, meanwhile it is worthy of note that the frequency of use also varies depending on what they are using it for particularly. This is similar to the findings of Udende and Azeez (2010) who reported that majority of university students use the internet frequently, few agreed that they used the internet daily and average used the internet on weekly basis.

The results gathered on the impact of usage of wireless fidelity on academic performance of undergraduates further stresses the importance of the same to UDUS students. It was found that using the wireless fidelity on campus had positive impact on the academic performance of the students. This disagrees with the findings of Paul *et al* (2012) that conducted a study and found that the time spends on the internet pose significant negativity on academic performance of the students, while this is not completely because it only applies to certain instances where the students don't use the Internet service provided for them for the right course. Anything good can be bad if not channeled towards the right thing. This view was further supported by Kirschner and Karpinski (2010) saying that excess involvement or obsession with social networking by students can have negatively impact on their academic performance.

Subsequently, usage of wireless fidelity was found to have been improving the student's frontiers of knowledge, giving them access to quality education, and a wide variety of materials on any topic. This implies that wireless fidelity which is a product of ICT has a positive effect on students learning and it corroborates the assertions of Abbas *et al* (2019); and Verbrianto *et al*, (2011) who stated that ICT can positively affect students learning outcomes. However, many of the students indicated that the use of wireless fidelity has greatly reduced their studying habits. When this was further looked into, many of the students explained that because they usually make use of their phones and other devices to access the school Wi-Fi, it has greatly reduced the rate at which they read the traditional books, because they completely rely on online sources for any information they need.

The fourth finding reveals that students of UDUS faced diverse challenges in the use of the available wireless fidelity on campus. These challenges, as found out during the study are so high that almost all the students expressed their displeasure. The challenges faced by the students include; limited internet enabled devices; power failure; low internet bandwidth; poor computer operating skills; unreliability of internet connection and small area coverage. This corroborates the findings of Alshammari (2016) who confirmed as he discovered that student at University of Botswana lacked skills, and this greatly affected their meaningful exploration of the internet. Also, Muhammad *et al* (2017) measured the problems of students in using internet services, it was gathered that majority of the respondents indicated the problem of power failure, some reported that they encountered the problem of slow internet speed, while some had poor computer skills, few had the problem of inadequate numbers of personal computers. Their finding is similar to that of (Quadri, 2011, Shehu, Urhefe & Promise, 2015). While Quadri (2011) found that the major challenge faced by the students while using the internet was power outage with majority of the participants. Shehu, Urhefe and Promise (2015) underlined several challenges faced by the participants while accessing the internet in Nigeria libraries.

Conclusion

Availability of wireless fidelity on campus has been found to be of great benefits to the students. It is a tool that can help the university to easily achieve its mandate of teaching, learning, and research. But its availability does not determine usage and its usage may not necessarily mean it is being used for the right purpose. The school Wi-Fi can be abused if the students engaged use it for practices such as cybercrime, gambling, pornography etc. Also, wireless fidelity on campus can be more productive if the institution can try and overcome specific challenges associated with ICTs like power, broadband speed, among others. Even with the shortcomings that were identified in this study, it can be concluded that there is a healthy usage of wireless fidelity on campus by undergraduates in UDUS.



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Recommendations

Based on the findings and identified gaps, the following recommendations were proffered:

1. Not all students have internet enabled devices. The school should go back to the days of providing internet enabled devices for the students at entry level.
2. Students should also be taught on how to connect to wireless network during computer related courses in class.
3. Governments should also make efforts to provide alternative power supply to the institution to overcome the challenges posed by power outage.
4. Funds should also be disbursed to the institutions in order to procure necessary, but expensive internet providing gadgets like router, LAN etc. across all the departments across the institutions.
5. The management of UDUS should increase their broadband network in order to enable the students have free flow of information access on the internet.

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