



Research Paper

Digital Literacy, Perception and Challenges of Elearning Among Undergraduates in Public Universities of Nigeria

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Abstract—E-learning has been attracting researchers from around the world and is considered an alternative mode of learning as opposed to physical education. The lockdowns of schools in Nigeria, which exposed the lack of digital preparedness among institutions as they adopted eLearning, have been brought to light by the Corona Virus epidemic that swept across the world. To determine whether students at the receiving end are sufficiently accepting of eLearning for effective implementation in school curricula, a study should be carried out. The survey therefore aimed at examining students' perception of the use of electronic learning, their views on eLearning as well as their own difficulties in taking part in this practice. The study was conducted using the Quantitative Research Method as well as Simple Random Sampling. This research took place at five publicly funded universities in Nigeria and covered a geopolitical area of the country. Data have been collected by means of an online questionnaire for the study. A total of one hundred and one (101) undergraduate students from public institutions in Nigeria took part in the study. In order to test the proposed hypotheses, regression analysis was carried out while data were made available in a frequency table. The study found that almost all of participants were digitally proficient and had the fundamental skills required to engage in eLearning. Due to cyber bullying, insufficient electricity supply and large costs associated with participation in electronic learning, it has also been identified that the majority of students are inclined to learn physically during classroom lessons instead of through eLearning. Also, it has been established that the digital literacy skills of students have no important relationship with their attitude toward eLearning.

Keywords—E-learning; Undergraduate Students; Public University; Post Covid-19 pandemic; Perception; Nigeria.

1. Introduction

One of the inventions that has continued to be relevant for human activities is information and communication technologies. Through the use of ICT, man is seeking more effective solutions to his problems every day. This left him in need of upgrading and updating his ICT tools and digital skills. It cannot be denied that ICT has facilitated the daily lives of mankind, by enabling them to carry out their tasks more easily. The human being now has an effective way of communicating, regardless of location or distance, in contrast with the previous time when most things were performed manually. Information and communications technology in the education sector has become a topic of interest to researchers since its widespread acceptance around the world. Use of ICT for online classes was investigated and explored by some pioneering colleges and Universities^[1]. Having discovered the benefits of ICT in teaching and learning, education seized to be restricted to the four walls of a classroom. Continuous learning is ensured by incorporating information and communication technologies into education. Due to the

development of ICT, people are increasingly adopting IT for education purposes^[2]. This is because eLearning provides a solution to the difficulties caused by distance learning between learner and tutor. The tool is intended to help teachers with improving the delivery of services. ELearning was an essential mode of learning to ensure continuity of education during Covid 19 lockdown. Although eLearning has proved to be an efficient way of ensuring the continuity of education, a number of institutions were not and have not been able to adopt it. The Covid 19 virus had a significant impact on the Nigerian education sector, as most schools were not prepared to adopt the new teaching method, e-learning. However, some institutions were prepared for the new method of teaching and were able to adopt it in their schools. Still, there were a few challenges ahead of them. The reasons for those who did not take up eLearning may be that they could not afford to establish the electronic teaching and learning facilities, because of financial constraints on establishing them as well as lack of necessary digital skills used in taking advantage of e-learning, combined with indifference among staff and students adopting a new pedagogical technique.

Schools have been encouraged to continue using e-learning after the ease of lockdown. Unfortunately, the advice does seem to be not being adhered to by a large majority of educational establishments who have gone back to their traditional teaching methods. The difficulty the schools faced in implementing eLearning when they were forced into lockdown because of the outbreak might have played a role in this transition back to an earlier teaching method. Little or no research has been carried out in Nigeria to ascertain whether the difficulties remain and if students are now willing to adopt e-learning. The focus of this study, however, was the student's perception of e-learning. This study will among others, study the attitude, perception, challenges and digital skills of e-learning among undergraduates in public tertiary institutions of Nigeria. The perception of the tutors may be a focus for further study. The study's findings will help policy makers to make decisions and it will add to existing body of knowledge on electronic learning.

This paper is organized as follows; introduction; related works; research methodology; results and discussion of findings; recommendations; conclusion and future scope; references;

1.1 Objectives of the Study

1. To assess the degree to which students in Nigeria's public higher education institutions are proficient in the use of ICT for educational purposes.
2. To find out the perceived usefulness of e-learning among undergraduates of public universities in Nigeria.
3. To find out the attitude of undergraduate students of public universities in Nigeria towards e-learning,
4. To find out the challenges faced by undergraduates of public universities in Nigeria when using e-learning platforms.

1.2 Research Questions

1. What is the digital skill of undergraduates in Nigeria?
2. What are the views of students from public universities in Nigeria on eLearning as a tool for learning?
3. What attitude does undergraduate students of public universities in Nigeria have towards electronic learning?
4. What challenges do undergraduates of public universities in Nigeria encounter when engaging in e-learning?

1.3 Hypothesis

- Ho1: The relationship between digital skills of students at public universities in Nigeria and their attitude to eLearning is not significant.
- Ho2: There is no significant relationship between attitudes of undergraduate students of public universities in Nigeria, and their perceived usefulness of e-learning.

2. Related Works

2.1 An Overview of E-Learning

Learning is the act of acquiring new skills and knowledge to improve one's capacity. Learning had been restricted to manual contact with information sources before Information and Communication Technologies were developed. Individuals far away from the source of information, such as schools or libraries, were finding it difficult to take part in learning activities. Schools started to conduct education and training activities within virtual spaces as a result of ICT and the Internet. This made it possible for people to acquire more knowledge at the comfort of their homes. Teaching and learning were no longer restricted to the four walls of schools but could be done electronically without individuals being in physical contact with the information sources. This act of learning was referred to as e-learning. The definition of eLearning has been called into question. Some people define eLearning as any activity to acquire skills and knowledge in which the use of ICT is involved. Some people believe that eLearning is connected with the use of electronic devices and the internet for teaching and learning. Essentially, eLearning can't be complete if the Internet doesn't exist. In spite of these controversies, eLearning can simply be considered as the use of ICT for teaching purposes. In 1999, Elliot Masieat at the TechLearn conference first made use of that term^[3].

Elearning is the application of internet and computer technology to solve problems^[4]. In other words, it has to do with sharing ideas and knowledge to people through the use of Internet supported devices. Similarly, some scholars are of the view that eLearning is an electronic learning process that involves sharing information and knowledge through the use of ICT to train others^[5]. In other words, ICT is used to train and educate people. ELearning also involves using internet enabled devices for the dissemination not only knowledge but also learning materials to people. This essentially means that the basic components of eLearning are: electrical devices, such as computers, cell phones, Internet multimedia units and so on. The earliest way of learning online was through storing recorded courses lectures on a CD-ROM which could be played by students. Some institutions are also broadcasting lectures on television and radio to their students, while they watched or listened at home.

The eLearning may take the form of a Synchronous or Asynchronous Learning. Synchronous learning is a form of education where students and tutors are involved in the teaching process. In synchronous classes, all students are expected to arrive at the same time for a fixed period of time. Synchronous learning can be defined in the following way; group discussions, cooperative learning, classroom learning and so on. Asynchronous learning is when you learn at your pace or time of choice. There is no fixed time for learning in asynchronous learning and students are not expected to join a class at same time. Examples of asynchronous learning include self-learning, presentation, and so on. ELearning may take place in formal settings, e.g. at an academic institution or the informal setting such as seminars, workshops, tutorials etc. In essence, eLearning refers to any form of teaching at all

levels that brings together the use of technology and computer networks for knowledge sharing and interaction in an environment which could be formal and informal.

2.2 Benefits of E-learning

There are different ways in which e-learning is of immense benefits to students and tutors. Some of these benefits are; promotion of collaborative learning, giving confidence to students, giving easy access to current resources, creating easy and faster access to staff and students, ensuring continual access and availability of course materials, ensuring the capture of every details of a lecture and ensuring lectures are taken in a comfortable and convenient environment. Below are brief discussions on each of the identified benefits.

- i. Promotion of collaborative learning: Students can easily engage in group learning at the comfort of their homes. It also makes it possible for them to easily share information resources among themselves.
- ii. Giving confidence to students: Some students are timid to ask questions in physical classes. The timid students can confidently drop questions in text. Some can also confidently talk during the online classes.
- iii. Giving easy access to current resources: Students and tutors can easily get updated by searching through the internet while in an online class. This makes it possible for the students to receive the right and current information about a phenomenal.
- iv. Creates easy and faster access to staff and students: Unlike the physical classes where appointment have to be booked to see a tutor, electronic learning allows students to easily communicate with their tutors. In a situation where there is no vacant classroom for teaching and learning, e-learning can be a way out to the problem.
- v. Ensuring continual access and availability of course materials: Documents on the e-learning platforms will always be available on the platforms. Students can easily download the course materials for their use as often as they want.
- vi. Ensuring capture of every detail in a class: Students might miss some key points in a physical class. This is not the case of e-learning were lectures are recorded and played by students as often as they want to get every details of what the lecturer said.
- vii. Ensuring lectures are taken in a comfortable and convenient environment: E-learning provides a convenient learning environment by making it possible for both the students and lecturers to have classes in the comfort of their houses.

Various researches have been done on the importance of electronic learning to students. A lot of authors emphasized that e-learning helps with teaching and learning. Studies have shown that electronic learning is more effective than the physical learning because it allows for flexibility of learning, more participation in discussions, and efficient learning^[6]. A number of recent studies have shown that eLearning is associated with students' performance in the classroom. Due to their active participation in eLearning, students' school performance increased^[7]. The reason for the academic improvement is not farfetched from the fact that electronic

learning allows students to easily get current information and can confidently ask questions more in online classes than the physical classes. Apart from giving confidence to students, e-learning also creates a comfortable and conducive environment for teaching and learning. In addition, it provides faster access to updated information resources. E-learning also provides a quick and easy access to a wide variety of information and information resources which are used by students and tutors to solve their information needs or problems. It will also be of immense benefits to disabled people because it will give them the chance of attending classes at the comfort of their houses, without the need of stressing themselves to attend the physical classes. It will also make it possible for learners to watch and re-watch recorded videos of lectures. Replaying the videos will help the learners with getting every details of the lecture.

2.3 Digital literacy skill

The possibility for an individual to use e-learning facilities with ease depends on the individual's digital skills. Level of digital skills ranges from basic, intermediate, advance and highly specialized skills. The person does not need a high level of digital skills to learn eLearning. However, to participate in eLearning, basic digital skills are required. Examples of such basic digital literacy skills are; ability to connect an electronic device to the internet, ability to download digital documents online, ability to install software, ability to navigate through e-learning platforms and so on. Digital literacy has to do with our interactions with digital technology^[8]. In this way, ICT could be used for sharing information, skills acquisition and development of more devices. It means the ability to organize, access and disseminate information using ICTs. This allows information to be created, found and shared easily. It also has to do with the ability to navigate through a digital tool, ability to search for information using the digital tool, ability to create more devices, and ability to evaluate the digital tool.

Being digitally literate is more than having the ability to interact with a device, it also includes having cognitive, sociological and emotional skills needed to act effectively in the digital world. Examples of cognitive skills are; logical reasoning, working memory, paying attention to details and so on. Examples of sociological skills are; effective communication, listening, adhering to ethics and so on, while emotional skills are; self-awareness, self-regulation, self-motivation, etc. Hence, a digitally literate person, has the skills of using ICT, evaluating ICT, and adheres to the social rules of ICT. It has been established that students are resourceful when using eLearning facilities and have the ability to apply ICT during their educational activities, according to a study on digital literacy skills of online participants at Covid 19 Pandemic Era^[9]. This is however possible because most of the students in the universities now, are digital natives. A similar study found that students have prerequisite digital skills^[10]. The prerequisite digital skills according to the authors are; ability to use ICT in locating and retrieving information from the Internet, and use it appropriately to solve their information needs.

2.4 Students Attitude to E-learning

Attitude is seen as a set of beliefs and feelings about someone and something. It is a mental construct which is only noticeable through one's behavior. Attitude plays a big role on how we see things. Attitude can either be positive or negative. When an individual has a negative attitude towards something, he or she will be discouraged from associating with that thing and vice versa. Students' attitudes to e-learning have great influence on their willingness to adopt e-learning. Some studies have reported students negative and positive attitudes towards electronic learning. A study found that students had negative attitudes to e-learning. Their interest in the use of information and communication technology for learning has been influenced by this. In addition, another study revealed negative attitudes towards eLearning among undergraduate students^[11]. Their interest in the use of information and communication technologies for learning has also been negatively affected by this attitude. A similar study was carried out by a different scholar on the relationship of students' motivation and their attitudes towards eLearning, and found that students preferred to mix eLearning with physical learning^[12]. Similarly, a scholar conducted a study on the perception of tertiary students to e-learning in West Bengal, and found that the students have a positive perception to electronic learning^[13].

2.5 Challenges of e-learning

Nigeria still lags behind in the use of ICT for learning because of poor ICT infrastructure and poor funding. In addition to these problems, the institutions do not have basic internet facilities to support e-learning. Students and tutors also, do not have the required skills needed to participate in e-learning. A study conducted by a scholar, it was stated that insufficient funds and inadequate digital skill in the utilisation of ICT for teaching and learning are the main difficulties in the implementation of electronic learning in schools^[14]. A similar study investigated in a study carried out by a scholar on the difficulty faced by the learners of English language during the Corona virus pandemic, and found that the main challenges that affected the students' e-learning were related to technical, academic, and communication challenges^[15]. The author stated that most of the respondents were not satisfied with e-learning because e-learning could not enable them to acquire the needed knowledge and skills. Furthermore, a study found that the major problem of the respondents with using e-learning were; distractions at home, ineffectiveness of teachers to use the e-learning platforms, lack of smart phones, financial difficulties to buy phone credits, challenges with using e-learning platforms, and eye problems which is caused by frequent exposure of the eye to bright light^[16]. Ja'asha conducted a study in 2020 found that the main challenges of using e-learning were academic, administrative, and technical challenges^[17].

Although the ICT centres have already been set up by institutions in Nigeria, teaching staff and students on how to use information and communication technologies as well as acquiring access to internet facilities for promoting eLearning has not received sufficient attention. The main challenges of e Learning are; distractions in online learning, poor internet

access, high Internet bandwidth cost, lack of information about how to use ICT, low network services and so on. In addition to these challenges, a number of students and lectures did not receive training on the use of ICT for eLearning. Such difficulties would be detrimental to the effective use of eLearning Platforms by students, which could in turn affect their educational performance. Digital divides are also visible in tertiary education.

3. Research Methodology

The Quantitative Research Model has been adopted in this study. Quantitative research involves collecting quantitative information on a phenomenon, analysing it with an instrument of statistical measurement and drawing inferences from its results. The students selected for the study are from public universities in Nigeria.

In this study, a two stage sampling procedure has been applied. The two stages included the use of ballots and a simple randomised sampling method. The selection of five (5) public universities in Nigeria through voting took place at the first stage. These five universities are the University of Ibadan, the University of Abuja, the University of Ilorin, the Federal University of Lokoja, and the University of Nigeria. The selected universities cut across geopolitical zones in Nigeria. The second stage involved random selection of respondents for the study through simple random sampling technique.

In this research a questionnaire has been used to collect data. A questionnaire was designed by the researchers, which listed a series of questions for selected students to answer. It was carefully designed to comprise questions that could be easily understood and answered by them. The questionnaire was developed and administered using Google form. The respondents were contacted on their school's social media platforms and physically in their classes. The Google form link was shared to the respondents through email and social media platforms. The data collection lasted for two months. A total of one hundred and one (101) undergraduates willingly participated in the research. The respondents were also assured of the confidentiality of their responses.

A tabular form was used to compare, aggregate and summarise responses from respondents. To that end the frequency of occurrence was calculated using Statistical Package for Social Sciences (SPSS). In addition, regression analysis was used to analyse the hypotheses. A regression analysis was used because it is appropriate to estimate the relationship of dependent and independent variables. The basis for the discussion of the research was the results of the analysis.

4. Results and Discussion of Findings

4.1 Demographic Characteristics

The data of the respondents was collected. A total number of one hundred and one participants participated in the study. Out the total participants, 28 (27.7%) respondents were University of Ibadan undergraduates, 17(16.8%) respondents

were University of Abuja undergraduates, 38 (37.6%) respondents were University of Ilorin undergraduates, 17 (16.8%) respondents were Federal University Lokoja undergraduates, and 1(1%) respondent was University of Nigeria undergraduate.

The respondents cut across eight (8) departments; Agriculture (7.9%), Arts (1%), Economics (2%), Education (25%), Management sciences (3%), Physical sciences (14.9%), Science (1%), Social sciences (46%).

Majority of the respondents are 200 level students (43%). Other respondents were in 100 level (5.9%), 300 level (15.8%) and 400 level (35.6%). Most respondents were between 21 and 25 years of age. Other respondents were in age range 16-20 years (27.7%), 26-30 years (28.7%) and 31 and above (1%).

4.2 Research Questions

Research Question one: Do undergraduates of public universities in Nigeria have the basic digital literacy skills for e-learning?

The responses of students collected to answer the above question was analyzed by the researcher and presented in a tabular form below. The result is shown in table 1 and 2 below.

Table 1: Use of ICT for educational purposes

S/N	Item	Scale	Frequency	Percentage
	Have you ever used your device for educational purposes?	Yes	100	99
		No	1	1
		Total	101	100

Table 2: Proficiency Level

S/N	Item	Scale	Frequency	Percentage
1.	What is your proficiency level in connecting your device to the Internet?	Highly Proficient	50.0	49.5
		Proficient	31.0	30.7
		Intermediary	20.0	19.8
		Novice	0	0
		Total	101.0	100
2.	What is your proficiency level in downloading e-resources online?	Highly Proficient	20.0	19.9
		Proficient	43.0	42.5
		Intermediary	33.0	32.7
		Novice	5.0	4.9
3.	What is your proficiency level in using your ICT device for educational purposes?	Highly Proficient	23.0	22.8
		Proficient	57.0	56.4
		Intermediary	20.0	19.9
		Novice	1.0	0.9
		Total	101.0	100
5.	What is your proficiency level in installing software on your device?	Highly Proficient	6.0	5.9
		Proficient	15.0	14.9
		Intermediary	7.0	6.9
		Novice	73.0	72.3
		Total	101.0	100

The collected data shows that most public university undergraduates in Nigeria have digital skills and have

engaged in electronic learning before as presented in item 1 of Table 1 and item 1-5 of Table 2. The Table 2 revealed most of the participants being highly proficient (49.5%) and proficient (30.7%) in connecting their electronic devices to the Internet and are proficient in other aspects of ICT usage. This is however not strange as most of the respondents are digital natives who have been familiar with the use of ICT at tender ages. Being tech savvy will make it easy for the students to quickly and easily adapt to the trend of using ICT for teaching and learning. The findings of this study are consistent with research undertaken by an expert to examine the relationship between digital literacy and internet information search strategies as a driving factor for use of electronic resources among young people from selected universities in Nigeria. The study showed that university students had a high level of digital literacy and were able to browse the Internet effectively in order to find information resources they needed [18]. A researcher found that his understudied undergraduates had moderate digital skills [19]. The results of this study are, however, different from those found by some studies in which students' digital skills were identified as lacking [20] [21]. Even though some studies reported deficiency in the digital skills of undergraduates, this study proves and supports other studies in Nigeria that Undergraduate students of public universities in Nigeria are digitally skilled.

Research Question 2: What are the views of students from public universities in Nigeria on eLearning as a tool for learning?

The responses of students collected to answer the above question was analyzed by the researcher and presented in a tabular form below. Below is the result in Table 3.

Table 3: Perceived Usefulness of electronic learning

S/N	Item	Scale	Frequency	Percentage
1.	E-learning can reduce the level of illiteracy	Strongly Disagree	2.0	2.0
		Disagree	18.0	17.8
		Neutral	6.0	5.9
		Agree	52.0	51.5
		Strongly Agree	23.0	22.8
		Total	101.0	100.0
2.	E-learning helps to improve educational attainment and raise standard of education	Strongly Disagree	11.0	10.9
		Disagree	6.0	5.9
		Neutral	53.0	52.5
		Agree	30.0	29.7
		Strongly Agree	1.0	1.0
3.	E-learning promotes flexibility of learning.	Strongly Disagree	0	0
		Disagree	16.0	15.8
		Neutral	4.0	4.0
		Agree	51.0	50.5
		Strongly Agree	30.0	29.7
4.	With E-learning, educational objectives and goals can be	Strongly Disagree	0	0
		Disagree	10.0	9.9
		Neutral	4.0	4.0
		Agree	56.0	55.4
		Total	101.0	100.0

	achieved	Strongly Agree	31.0	30.7
		Total	101.0	100.0
5.	Creative and innovative teaching and learning is possible with e-learning	Strongly Disagree	0	0
		Disagree	10.0	9.9
		Neutral	5.0	5.0
		Agree	55.0	54.5
		Strongly Agree	31.0	30.7
		Total	101.0	100.0

The study also found that public University undergraduates have a positive perception of e-learning usefulness as shown in item 1-5 of Table 3. This finding was expected because most of them have engaged in e-learning before and have enjoyed the benefits accrued to e-learning. Having a positive perception of the usefulness of e-learning, could make the undergraduates to poses favourable attitude towards e-learning and in turn make e-learning implementation easy in their schools [22]. The results of this study are similarly the same as a study conducted in Malaysia to find out whether eLearning is used by tertiary school students. The authors found that the understudied students positively perceived eLearning as a useful mode of learning [23]. Furthermore, a study has been conducted in Malaysia to investigate Malaysian local university students' perception of eLearning and their intentions on using it. In their study, they found that understudied students have a positive opinion about the usefulness of eLearning in schools [24]. The findings of this study confirm that students at university, in particular those going to public universities from Nigeria, generally have a favourable opinion about the usefulness of eLearning.

Research Question 3: What attitude does undergraduate students of public universities in Nigeria have towards electronic learning?

The responses of students collected to answer the above question were analyzed by the researcher and presented in a tabular form below. Below is the result in Table 4.

Table 4: Attitude of students to e-learning

S/N	Item	Scale	Frequency	Percentage
1.	I find e-learning more boring than the physical class learning	Strongly Disagree	4.0	4.0
		Disagree	21.0	20.8
		Neutral	13.0	12.9
		Agree	52.0	51.5
		Strongly Agree	11.0	10.9
		Total	101.0	100.0
2.	I learn faster in physical classes than in virtual classes	Strongly Disagree	1.0	1.0
		Disagree	17.0	16.8
		Neutral	7.0	6.9
		Agree	51.0	50.5
		Strongly Agree	25.0	24.8
		Total	101.0	100.0
3.	E-learning should not be encouraged	Strongly Disagree	5.0	5.0
		Disagree	20.0	19.8
		Neutral	24.0	23.8

	in schools	Agree	49.0	48.5
		Strongly Agree	3.0	3.0
		Total	101.0	100.0
4.	I feel more comfortable while in physical class than in online classes	Strongly Disagree	1.0	1.0
		Disagree	15.0	14.9
		Neutral	14.0	13.9
		Agree	52.0	51.5
		Strongly Agree	19.0	18.8
		Total	101.0	100.0
5.	I will prefer to learn from a book than using online facilities to learn	Strongly Disagree	1.0	1.0
		Disagree	18.0	17.8
		Neutral	18.0	17.8
		Agree	51.0	50.5
		Strongly Agree	13.0	12.9
		Total	101.0	100.0

This study has shown that students at public universities have an unfavourable view of eLearning, despite the fact that they perceive it to be beneficial. Most respondents prefer to learn by physical means than through eLearning, as stated in item 1-5 of Table 4. The difficulty of students in integrating eLearning into their studies could be a reason for this negative attitude. The findings of the study on students' perceptions of eLearning in Malaysia, which was carried out at a Malaysian university, support this conclusion. The study revealed that despite their positive views of the usefulness of eLearning, Malaysia's native students still preferred to learn through physical classroom training rather than electronically [25]. A similar study has shown that students at the Jordanian University have a negative attitude towards eLearning and prefer physical learning to eLearning [26]. The findings are also consistent with a study carried out in which most of its understudied students had negative attitudes to the use of eLearning platforms, and prefer physical interaction on account of the difficulties that they face when used this platform [27]. It is also consistent with another study, which reported that their research respondents considered eLearning to be less effective [28]. Another study conducted during the Convid 19 lockdown revealed that female Bangladeshi nursing students prefer physical classes over electronic learning [29]. This negative behavior is however not farfetched from the challenges and restrictions the students face when engaging in e-learning. Therefore, schools should do their utmost to ensure that tutors and students feel comfortable taking part in eLearning.

However, a study contradicted the result of this research by reporting a positive attitude of electronic learning among the understudied Accounting undergraduates [30]. In spite of that, it has been shown in the study that students at private universities have an unfavourable attitude towards eLearning. Efforts should be done by school authorities to ensure the students poses good attitudes to e-learning because it will enable the students to take risk for self-development irrespective of the obstacles they face [31].

Research Question 4: What challenges do undergraduates of public universities in Nigeria encounter when engaging in e-learning?

The responses of students collected to answer the above question were analyzed by the researcher and presented in a tabular form below. Below is the result in Table 5.

Table 5: Challenges

S/ N	Item	Scale	Frequency	Percentage
1.	E-learning cost more than physical teaching and learning	Strongly Disagree	0	0
		Disagree	11.0	10.9
		Neutral	5.0	5
		Agree	57.0	56.4
		Strongly Agree	28.0	27.7
	Total		101.0	100
2.	E-learning makes learner and tutor to be lazy	Strongly Disagree	2.0	2.0
		Disagree	15.0	14.9
		Neutral	13.0	12.9
		Agree	56.0	55.4
		Strongly Agree	15.0	14.9
	Total		101.0	100.0
3.	E-learning puts one at the risk of cyber-bullying	Strongly Disagree	1.0	1.0
		Disagree	17.0	16.8
		Neutral	14.0	13.9
		Agree	56.0	55.5
		Strongly Agree	13.0	12.9
	Total		101.0	100
4.	Inadequate power supply affects full utilization of e-learning facilities	Strongly Disagree	1.0	1.0
		Disagree	8.0	7.9
		Neutral	1.0	1.0
		Agree	56.0	55.4
		Strongly Agree	35.0	34.7
	Total		101.0	100.0
5.	I get distracted when using e-learning facilities compared to when learning in the physical classes	Strongly Disagree	0.0	0.00
		Disagree	6.0	5.9
		Neutral	12.0	11.9
		Agree	57.0	56.4
		Strongly Agree	26.0	25.7
	Total		101.0	100.0

The study also found that public university undergraduates are faced with quite a lot of challenges when engaging in e-learning. As shown in item 1-5 of Table 5, public university undergraduates are faced with cyberbullying, high expense of connecting to the internet, irregular power supply and online distractions, when engaging in e-learning. The finding has also been reported by a scholar who conducted a study to find the prospects and challenges of eLearning among the students of National Open University of Nigeria (NOUN), and found that the main challenges the undergraduates of the National Open University of Nigeria face when engaging in e-learning are; lack of Internet installations, increased price of software and unstable power supply [32]. A similar study was conducted to investigate the challenges of eLearning among tertiary students of colleges of education in south east, Nigeria, and found that the major challenges facing the students are;

unstable power supply, poor e-learning facilities, and unstable network [33]. Additionally, a study found that Türkiye students are faced with poor internet access, and poor e-learning facilities when learning online [34]. The implication of these challenges is, students will be reluctant to participate in e-learning, and this could result in wastage of the resources and time spent by the school authorities in incorporating e-learning in their school curriculums. Hence, school authorities need to tackle each of these challenges to ensure a safe and easy environment for e-learning to be implemented successfully.

4.3 Research Hypotheses

Ho1: The relationship between digital skills of students at public universities in Nigeria and their attitude to eLearning is not significant.

Table 6: Test results of hypothesis one

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	14.808	1	14.808	1.573	.213 ^a
Residual	931.826	99	9.412		
Total	946.634	100			

The tested hypothesis has shown that there exists no significant relationship between the digital skills of university students in Nigeria and their attitudes towards eLearning. This finding is indicated in Table 6 which revealed that the predictor variable does not predict the study’s dependent variable. As shown in the table, the P-value of the ANOVA is 0.213 which is greater than the significant value of 0.05 (P > 0.05). Hence, the formulated hypothesis is accepted to be true. Therefore, the public university student’s digital skills and their attitudes towards e-learning do not in any way have a significant effect on each other. This finding differs from the findings of a study conducted by an academic who investigated the relationship between attitude to ICT and digital competences, and established that students' attitudes towards ICT are linked with their digital competences [35]. However, it differs to the findings of a study which revealed a no association between attitude to ICT and digital skills [36]. Notwithstanding, this study affirmed the assumption that there’s no relationship between public university undergraduate’s digital skills and their attitude to eLearning.

Ho2: The attitudes of students at Nigerian public universities on eLearning and their perceptions about its usefulness are not significantly related.

Table 7: Test results of hypothesis two

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.854	1	.854	.089	.766 ^a
Residual	945.780	99	9.553		
Total	946.634	100			

The tests have shown that there is no substantial relationship between public university students' perceived usefulness of eLearning and their attitudes towards it. This finding is shown in Table 7 which revealed that the predictor variable does not predict the study's dependent variable. According to the table, the Pvalue of the ANOVA is 0.766, which is higher than the significant value of 0.05. Hence, the formulated hypothesis is accepted to be true. Therefore, the public university student's digital skills and their attitudes towards e-learning do not in any way have a significant effect on each other. Therefore, there is no relationship between the perceived usefulness of eLearning and perception of its usefulness among public university students. This was in contrast to a study that has been done on attitudes towards eLearning for students at Western Nigerian University, which examined the correlation between their perceptions of what is useful about eLearning and how they respond to it^[37]. It has been demonstrated that there is no relationship between attitudes and perceived usefulness of eLearning among public university students in Nigeria, according to this study.

5. Recommendations

The following recommendations are made based on the findings of this study.

- i. School authorities should procure more e-learning facilities for the students.
- ii. School authorities should provide free access to the internet to enable the students participate in e-learning.
- iii. School authorities should organize a workshop to orientate students on the ethics of e-learning.

6. Conclusion and Future Scope

The primary focus of this study was to investigate and reveal the ICT proficiency level of public university undergraduates in Nigeria, their attitude towards e-learning and the challenges they face when using e-learning. The study contributed to knowledge by giving an exposition of the e-learning perception of undergraduates of public universities in Nigeria and challenges the students face when engaging in e-learning, which has not been found before by other scholars. In order to confirm the expectation of the study, the authors collected and analyzed data gotten from undergraduates of five (5) public universities in Nigeria. The authors ran a regression analysis to confirm the stated hypotheses. The connection between digital skills and attitudes to eLearning among public university students has been found not to be significant (Table 6). The analysis also showed no significant association between the public student's perception of eLearning to be useful and his or her attitude towards eLearning (Table 7). These findings buttressed the findings of other similar researches conducted by other researchers. It affirms the disassociation of perceived usefulness and attitude, and also affirms the disassociation of digital skills and attitude. In line with the above findings, the authors ran a frequency table to determine the attitude, perception, and challenges of the students to e-learning, and affirms that public university undergraduates have a positive perception of the usefulness of e-learning in their school

activities (Table 3) but would rather engage in physical classroom learning than electronic learning because of the challenges they face engaging in electronic learning (Table 5). Due to the focus of our study to undergraduates, our study clearly neglected public University Postgraduate Students. To correct this limitation, we plan to develop a similar survey on postgraduate students of public Universities in Nigeria, and possibly do a comparative study on the eLearning perception of private University students and the public University students in Nigeria.

Data Availability

The data supporting this study's findings can be made available on request to the authors through their email addresses. The data set was excluded here because of its bulkiness and privacy of some of the data sets.

Conflict of Interest

There is no conflict of interest

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Author's contribution

The first author reviewed literatures for the study while the questionnaire design, data collection and analysis were done by both the first and second author.

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