

Electro-Learning amidst Covid-19 Lockdown and Related Challenges of Undergraduates in Nigerian Universities

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Received: July 27, 2022. Revised: August 19, 2023. Accepted: September 15, 2023. Published: October 30, 2023.

Abstract—This paper examined the various electronic learning platforms adopted by undergraduates in Nigerian Universities which include both private and public universities in Nigeria and its related challenges during the COVID-19 lockdown in 2020. The coronavirus' enormous consequences, which affected all countries and industries, influenced around 91% of the world's students. The objective of this study is to investigate the experiences of private and public university undergraduates in a Nigerian University, to determine whether there is a significant disparity in the accessibility, affordability, and ease of use of the various e-learning platforms that were adopted during the global pandemic lockdown. The study employed the survey method in eliciting useful information from undergraduates in Covenant University, and in the University of Lagos. The population of the study consisted of 374 undergraduates from both schools. Due to the inaccessibility of students whose lecturers were on industrial action by the Academic Staff Union of Universities, the questionnaire was physically distributed to students at Covenant University, while a Google form was generated for students at the University of Lagos. Data was analyzed using descriptive techniques in frequencies, percentages, and linear regression analysis. Results from the study revealed that 68.1% of students at Covenant University utilized more e-learning platforms like Moodle, Coursera, Zoom, and WebEx unlike their counterparts at the University of Lagos who used only Moodle and Zoom with 43.6%. Also, 87.5% of Covenant University undergraduates made use of their laptops mostly for their e-learning classes while 56.4% of their counterparts in the University of Lagos mostly made use of their smartphones. Findings revealed that students from public Universities faced major challenges such as unstable internet, limited financial capability in buying devices such

as laptops, and lack of skill and competence in navigating the e-learning platforms while students in the private universities on the contrary had relatively stable internet connectivity, could afford laptops and smart devices and had the requisite skills to properly navigate their e-learning platforms. The study concludes by recommending the provision of substantial financing that will aid in the acquisition of relevant technology to promote and support e-learning in public universities in Nigeria. It also suggested the inclusion of public University students with adequate training on how to navigate the e-learning platforms, thereby equipping them with the requisite skills needed to maximize the benefits of e-learning. The study emphasizes how the use of e-learning can be an effective sustainable learning solution for current and future situations by the main actors, educators, and learners. In the long run, the Nigerian educational system would be better prepared to face future emergencies that may warrant the adoption of remote learning.

Keywords: COVID-19, Challenges, E-learning platforms, Emergencies.

I. INTRODUCTION

COVID-19, commonly known as Coronavirus disease, is a severe acute respiratory disease that was reported at the end of 2019 in Wuhan, China, [29]. The World Health Organization (WHO) then declared it a global health emergency in January 2020, and a pandemic in March 2020. The World Health Organization then declared it a global health emergency in January 2020, and a pandemic in March 2020, [1]. According to, [2], as of February 2022, over 409 million confirmed cases and 5.8 million deaths have been reported worldwide. With this global emergency reaching both developed and developing countries, Egypt was the first African country to announce a COVID-19 infection, with approximately 270,000 cases reported across Africa, 7,000

deaths, and 121,000 recoveries, [3]. According to, [4], the Nigeria Centre for Disease Control (NCDC) declared the first case of the virus in Nigeria in February 2020 with a record of 53, 477 cases, 41,017 discharged patients, and over 1, 000 fatalities.

With this significant catastrophic effect of the pandemic on humanity, many companies, airlines, hospitality, industrial sectors, and sports, alongside the world's political, social, economic, religious, and financial systems were severely disrupted. So, in a bid to curb the further spread of the virus, governments declared a shutdown on all social and economic activities for an infinite length of time in the early month of 2020, [5]. According to, [6], the education sector was not left out of this catastrophe as schools at all levels were also shut down worldwide. The suspension of activities in the educational sector, resulted in grave consequences for more than 1.5 billion registered students of all ages from across the world, accounting for almost 90% of the worldwide student population, [7].

The study, [8], reported that this unprecedented circumstance required instructors, parents, and students to adjust rapidly to a new educational context: remote learning, globally. In Nigeria, the Federal Ministry of Education ordered the immediate closure of educational institutions at all levels as part of the steps to restrict the spread of COVID-19 in March, 2020, [9]. This thus resulted in the migration or shift from the traditional method of teaching to the online environment. Online learning provided a realistic choice for sustaining educational continuity in the pandemic situation. Universities adopted the Ministry of Education's recommendation to move to virtual teaching, utilizing existing institutional software and available digital platforms. Lecturers and teachers were required to provide online academic resources that could be accessed from home to maintain educational continuity while maintaining the appropriate physical distance. For the majority, students in primary and secondary schools had to depend largely on online resources provided by their teachers. For college students, lockdown often entails returning to their hometowns while maintaining contact with their instructors and classmates using video conferences, email, and other digital technologies, [8].

For many institutions around the world, it was a first-time experience having to migrate to the online teaching environment which unavoidably posed several challenges. Several Nigerian universities had not planned for any contingency that may impede education, such as the COVID-19 pandemic lockdown, but management teams at some institutions were able to give direction and assistance to guarantee that learning activities continued, and students were evaluated online.

In, [10], the authors asserted that the pandemic brought the chance to extend learning outside of the typical classroom setting via online education. This mode of education describes the use of various digital technologies for learning and teaching procedures that allow lecturers and students to interact without necessarily being in the same physical space. This was also of crucial importance at the time, when social

distancing was needed to curb the spread of the virus from person to person, [9].

The study, [11], reported that online learning resources included structured learning programs that students may complete at their own speed and that they can browse at their convenience, as well as real-time courses taught by lecturers utilizing online meeting software. Several developed countries were recorded to have adopted online systems using various strategies and technologies. For instance, Estonia worked with non-profit organizations to offer pupils free access to a plethora of instructional materials when schools were physically closed. Students in elementary and secondary schools in France also had access to the already-existing distance learning scheme "*Ma classe à la maison*" (My lessons at home). Together with other online learning resources, instructors in Greece delivered virtual, real-time classroom teaching. Television broadcasts with instructional content to assist pupils' learning were another well-adopted method of instruction in several developed nations. Television programs in various nations (such as Greece, Korea, and Portugal) were adopted for younger students in elementary schools who could have had difficulty accessing internet learning tools or engaging in self-directed learning. Nevertheless, the availability and learners' access to technological devices such as laptops, cell phones, and tablets have a positive influence on electronic learning.

Several researchers have conducted studies related to electro-learning during the COVID-19 pandemic and its challenges. The challenges contributed to literature have cut across developed countries of the world while only a few have related to the juxtaposition between a public and a private tertiary institution within a developing country, such as Nigeria, [12]. However, some of the related challenges and obstacles with online teaching and learning include the following:

Accessibility

The challenge of accessibility includes factors such as internet connectivity, and access to technological devices for e-learning purposes, [13]. Students without dependable internet connection and technology found it difficult to participate in digital learning. These were some of the concerns and obstacles that were experienced by professors lecturers and students while adopting the online teaching and learning technique. Students in remote locations struggled with limited internet connectivity, which had a negative impact on their academic progress and caused delays in work completion. The study, [3], opined that 89% of students in Sub-Saharan Africa did not have access to personal computers, and 82% percent did not have access to the Internet, implying that these online programs were not able to accommodate all learners. Furthermore, around 60% of Nigerian learners did not have access to the internet with about 169.2 million or 83% of the population had access to mobile phone connections; however, half of these, or 84.5 million individuals, lived in municipal areas.

The population with access was geared towards higher socioeconomic homes and urban households, with a staggering majority of private learners, [14]. Previous research then

revealed that learners who lived in rural areas of developing countries had no access to internet connections which affected their e-learning processes, [15].

Unsuitable learning environments

Previous research also revealed that learners experienced unsuitable physical settings for online learning at home, which can disrupt learners' concentration, hereby having an effect on learning results, [16]. These issues could also range from software and hardware errors, to distractions from other websites, and distractions from home. Studies also revealed that lack of appropriate physical space at home for online learning created a hindrance to learners' concentration during online learning leading to issues like anxiety and stress for students, [15].

Erratic Power Supply

In addition, previous research carried out in a Nigerian tertiary institution revealed that the erratic power supply in some residential areas affected students negatively during the online learning period. Devices could not be powered due to the erratic power supply, so in addressing this challenge, students resorted to the use of power banks and generators, others utilized the internet café to ensure their e-learning connectivity during the COVID-19 pandemic, [17], [18], [19].

Lack of Motivation

Previous research also revealed that students experienced challenges in terms of being motivated for learning, [20]. It was categorized as an internal factor against online learning such that students experienced difficulty in staying focused for long for the duration of online learning, [21]. The study, [22], also reported in a study, other challenges faced by students in Nigeria included a lack of motivation to embrace e-learning, insufficient bandwidth and internet connectivity, inadequate ICT facilities to cater to students on the e-learning platform, and a lack of sufficient skill and technically competent lecturers, [23].

Limited Financial Capability

Access to an internet connection is a major requirement in engaging in e-learning. However, within the Nigerian context, in relation to the cost of internet bundles, the rate of purchase was considered high. Students reported spending a significant cost in purchasing data bundles for their e-learning classes. For students from affluent families, it was an affordable expense compared to their counterparts. Reports revealed that one of the students spent close to the sum of #5,000 (\$ 13 USD) each month for data bundle purchases. However, studies revealed that some students from religious (faith-based) institutions were supported with the supply of data bundles, for their e-learning classes, [16].

Previous studies reported that while some Nigerian learners could adopt the e-learning phase, others could not, due to a lack of opportunities for the essentials needed to connect to e-learning classes, [24].

Inefficient communication with lecturers

Recent studies by, [25], revealed that there was a lacuna in the communication between the students and the lecturers. These issues ranged from lack of encouragement for students during

online learning, inability to provide guidance to students during the e-learning, inability to integrate students' individual differences and abilities via the online learning mode, and inability to provide adequate teaching skills to learners.

Inadequate skills and competence in online learning

The COVID-19 pandemic revealed the level of skill and competence deposited in lecturers for the discharge of their teaching duties, [26]. They ranged from a lack of expertise, time management, and attitude to online learning and technological skills required, [25].

However, there is a dearth of literature on the comparison of the availability and utilization of e-learning resources in both private and public institutions, and the challenges students with the use of these resources in both public and private universities in Nigeria.

The main objective of this paper is to examine the experiences of private and public university undergraduates to determine whether there is a significant disparity in the accessibility, affordability, and ease of use of the various e-learning platforms that were adopted during the global pandemic lockdown. E-learning platforms, affordability, challenges, and preference for online or face-to-face modes of instruction were all examined in this study. It also sought to establish the effectiveness of e-learning in teaching at both universities.

II. METHODOLOGY

The paper used a descriptive cross-sectional research design using a survey data gathering method. Covenant University in Ota, Ogun State, and the University of Lagos in Akoka, Lagos State are among the institutions studied for this study. Undergraduates from Covenant University and the University of Lagos made up the study population. For the two schools, multi-stage sampling techniques were adopted. Colleges and faculties were then divided into clusters and respondents were chosen randomly. The University of Lagos has an estimated undergraduate student population of 44, 183, whereas Covenant University has an estimated undergraduate student population of 7, 536. The sample size of 396 was calculated using the Taro Yamane sample size calculation. To account for any possible marginal mistake brought on by a lost or incomplete questionnaire, this was raised by 30%. Following the 30% increase, a sample size of 514 was generated, which was then split between two institutions. This resulted in each institution generating 257 anticipated answers. The paper's inclusion criteria focused on students who were enrolled before the COVID-19 pandemic lockdown began. They comprised all 200-level students, 300-level students, and students in their final year.

Furthermore, students enrolled after the pandemic year 2020 were not included in the exclusion criteria. As a result, it excludes undergraduates presently enrolled at the 100 level. Close-ended questions were included in a well-structured questionnaire. Data from this study was analyzed using Statistical Package for the Social Sciences (SPSS). It used descriptive statistics to analyze the socio-demographic statistics of students, as well as frequencies, percentages, and

regression analysis to assess the e-learning platforms that were available and adopted for use, the most used technological device, the cost of use, and the challenges with the use of e-learning which were encountered during the pandemic.

The overview of data consisted of a total of 241 questionnaires which were retrieved from Covenant University, out of a total of 257 that were distributed in four undergraduate halls of residence. However, due to ongoing industrial action by the Academic Staff Union of Universities (ASUU) in Nigerian federal universities, including the University of Lagos, a Google form was created and sent to friends and acquaintances over WhatsApp platform. With daily follow-ups and reminders, this resulted in a total of 133 answers in a week. A total of 374 responses from both schools were then analyzed.

III. RESULTS

The distribution of respondents based on their characteristics includes school, gender, age group, religion, and current level.

TABLE I. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

University	Frequency	Percent
Covenant University	245	65.5
University of Lagos	129	34.5
Total	374	100.0
Gender		
Male	134	35.8
Female	240	64.2
Total	374	100.0
Age Group		
16-19 years	145	38.8
20-23 years	180	48.1
24-27 years	20	5.3
28-31 years	29	7.8
Total	374	100.0
Religion Affiliation		
Christianity	341	91.2
Islam	25	6.7
Others	8	2.1
Total	374	100.0
Current level of study		
200 level	42	11.2
300 level	99	26.5
400 level	127	34.0
500 level	106	28.3
Total	374	100.0
Current level of study		
200 level	42	11.2
300 level	99	26.5
400 level	127	34.0
500 level	106	28.3
Total	374	100.0

The distribution of university shows that 65.5% of the respondents are from Covenant University while 34.5% are covered in the University of Lagos. The gender distribution revealed 35.8% (male) and 64.2% (female) as shown in Table I. The age group revealed that 38% of respondents belonged within 16-19 years, 48.1% belonged to 20-23 years, only 5.3% belonged within the age group of 24-27 years and 7.8% belonged to 28-31 years. Also, the respondents who are affiliated with the Christian religion were about 91.2% while 6.7% belonged to the Islamic religion while 2.1% belonged to

other religions (Table I). The current level of respondents in the 200 level is 11.2%, 300 level students were 26.5% while 400 level respondents were 34.0%, and 28.3% of respondents showed to be in the 500 level as shown in Table I.

TABLE II. E-LEARNING PLATFORMS ACCESSED DURING THE PANDEMIC

E-learning Resources	Covenant University		University of Lagos	
	Yes	No	Yes	No
Zoom	243(68.1%)	-	114 (31.9%)	2(10%)
Total	243 (67.7%)		116 (32.3%)	
Moodle	215(90.3%)	4(16%)	23 (9.7%)	21 (84%)
Total	219 (83.3%)		44 (16.7%)	
Google Classroom	31 (39.7%)	109(87.9 %)	47 (60.3%)	15(12.1%)
Total	140 (69.3%)		62 (30.7%)	
WhatsApp	98 (52.1%)	75(94.9%)	90 (47.9%)	4 (5.1%)
Total	173 (64.8%)		94 (35.2%)	
Telegram	170(68.8%)	24 (28.8%)	77 (31.2%)	5 (17.2%)
Total	194 (70.3%)		82 (29.7%)	
Coursera	226 (96.2%)	3 (10.3%)	9 (3.8%)	26(89.7%)
Total	229 (86.7%)		35 (13.3%)	

Table II shows the results for the tools and resources utilized by these two institutions, both Covenant University and the University of Lagos. It reveals that 68.1% of respondents made use of the Zoom platform at Covenant University while none was recorded not to have used it. In the University of Lagos, 31.9% of respondents made use of the Zoom platform for e-learning while only 2% were recorded not to have used it. It shows that 90.3% of respondents made use of the Moodle platform at Covenant University while 16% did not make use of this. In the University of Lagos, it shows that only 9.7% of respondents made use of the Moodle platform while 84% of respondents did not make use of this platform. At Covenant University, only 39.7% of respondents made use of the Google Classroom platform while about 87.9% of respondents did not make use of this. At the University of Lagos, 60.3% of respondents made use of Google Classroom while 12.1% of respondents did not make use of it. Table III further shows that 52.1% of respondents made use of the WhatsApp platform at Covenant University, while 94.9% of respondents had no use of the platform during the pandemic lockdown. At the University of Lagos, 47.9% of respondents made use of the WhatsApp platform while 5.1% did not make use of this platform. At Covenant University, 68.8% of respondents used the telegram platform, while 82.8 % did not use this platform. In addition, 31.2% of respondents at the University of Lagos used this platform, while 17.2% did not. Also, 96% of Covenant University students said they used the Coursera resource, while only 10.3% said they didn't. Similar numbers were seen at the University of Lagos, where 3.8% of students took use of the online tool, while 89.7% of respondents did not make use of this platform.

TABLE III. MOST USED TECHNOLOGICAL DEVICES IN TERMS OF AFFORDABILITY

Devices	Covenant University	The University of Lagos	Total
Smartphone	82 (43.6%)	106 (56.4%)	188
Laptop	154 (87.5%)	22 (12.5%)	176
Desktop	9 (90%)	1 (10%)	10
Total	245 (65.5%)	129 (34.5%)	374

Table III reveals that 43.6% of respondents made use of their smartphones the most in Covenant University while 56.4% of respondents in the University of Lagos made use of their smartphones mostly for the use of e-learning classes. It also shows that 87.5% of respondents made use of their laptop at Covenant University while only 12.5% of respondents made use of theirs at the University of Lagos. Table III also shows that 9% of respondents made use of a desktop in Covenant University while 10% made use of a desktop in the University of Lagos.

TABLE IV. THE CHALLENGES OF USING E-LEARNING

Selected Indicators	Covenant University		University of Lagos	
	Yes	No	Yes	No
Unstable internet connectivity	192(63%)	53(76.8%)	113(37%)	16(23.4%)
No access to a tech device	13(39.4%)	232(68%)	20(60.6%)	109(32%)
Erratic Power supply	157(59.9%)	88(78.6%)	105(40.1%)	24(21.4%)
Heavy Workload	138(68.3%)	107(62.2%)	64 (31.7%)	65(37.8%)
Limited Financial Capability	122 (56.5%)	123 (77.8%)	94 (43.5%)	35 (22.2%)
Lack of Motivation	199 (68.9%)	46 (54.1%)	90 (31.1%)	39 (45.9%)
Distractions from home	202 (67.1)	43 (58.9%)	99 (32.9%)	30 (41.1%)
Limited skill and competence	151 (63.7%)	94 (68.6%)	86 (36.3%)	43 (31.4%)
Communication with lecturers	159 (66.8%)	86 (63.2%)	79 (33.2%)	50 (36.8%)

Table IV reveals that several indicators were used to measure the challenges that respondents faced at both Covenant University and the University of Lagos. At Covenant University, 63% of respondents affirmed to have experienced unstable internet connectivity while 76.8% of respondents did not experience such. In the University of Lagos, 37% of respondents affirmed to have had unstable internet connectivity while only 23.4% of respondents did not experience such. Table IV shows that 39.4% of respondents in Covenant University affirmed to have no access to a

technological device while 68% did not have that setback. At the University of Lagos, 60.6% of respondents affirmed to have no access to the use of a technological device while 32% did not have that challenge. Table IV also shows that 59.9% of respondents experienced an erratic power supply while 78.6% of respondents did not have that challenge. At the University of Lagos, 40.1% of respondents affirmed that had experienced that challenge while 21.4% did not have that challenge. At Covenant University, 68.3% of respondents affirmed to have had a heavy workload while 62.2% did not. At the University of Lagos, 31.7% of respondents affirmed to have had this same challenge while 37.8% did not. It shows that 56.5% of respondents experienced limited financial capability while 77.8% were not financially limited to using the e-learning platforms. In the University of Lagos, 43.5% of respondents had the challenge of finances while 22.2% did not have this challenge. It also shows that 68.9% of respondents had the challenge of being motivated while 54.1% did not experience this. It also shows that 31.1% of respondents had the challenge of being motivated at the University of Lagos while 45.9% of respondents did not have this challenge. Distractions from home were a challenge for 67.1% of respondents in Covenant University while 58.9% did not have this challenge during their e-learning experiences. Also, at the University of Lagos, 32.9% of respondents had the challenge of having distractions from home while 41.1% did not have this challenge. In addition, Table IV shows that 63.7% of respondents at Covenant University had the challenge of having limited skill and competence in using the e-learning platform while 68.6% did not have that challenge. At the University of Lagos, 36.3% of respondents had the challenge of having limited skill and competence to make use of the e-learning platforms while 31.4% of respondents did not have this challenge. Lastly, 66.8% of respondents in Covenant University had the challenge of communicating with their lecturers effectively while 63.2% did not have this challenge. In the University of Lagos, 33.2% of respondents also have the challenge of communicating with their lecturers while 36.8% of respondents did not have that challenge.

The Comparison of the preferred mode (Face-to-face and online) and the effectiveness of the e-learning platforms for teaching

This hypothesis tested the preference for online or face-to-face mode and the effectiveness of the e-learning platform for teaching. The two variables are captured in categorical forms, thus, the use of Analysis of Variance (ANOVA) is used to determine whether the means of the independent variable are equal. The hypothesis is, however, presented in Null format as follows:

H₀: There are no differences in the preferred mode and effectiveness of the e-learning platform for teaching.

The decision level (also referred to as Critical Region) by default says:

- Reject the Null hypothesis (H₀) if the F-calculated is greater than the F-tabulated.

- Accept the alternative hypothesis (H_1) if the F-calculated is greater than the F-tabulated.

The main point of reference is the **F-statistic** and the corresponding **p-value**. The larger the F-statistic, the greater the variation between sample means relative to the variation within the samples. F-value is used to determine whether the test is statistically significant or not. Specifically, the larger the F-statistic, the greater the evidence that there is a difference between the group means. In terms of computation, the F-statistic tells the **ratio of two variances** that measure the dispersal of the data points around the mean. The data would reveal higher variances when the individual data points are far from the central point. Thus, higher variance could lead to the rejection of the alternative hypothesis instead of accepting it. The result of the analysis is presented below:

TABLE V. PREFERRED MODE AND EFFECTIVENESS OF THE E-LEARNING PLATFORM FOR TEACHING

Sources	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.209	1	1.209	5.854	0.016
Within Groups	76.847	372	0.207		
Total	78.056	373			

From the result of Table V, the F-calculated = 5.854 while the F-statistic at 95% Confidence Interval = 3.84 (i.e. $F_{\alpha, 1, 373} = 3.84$). It therefore means that F-calculated is greater than F-tabulated.

Since $F_{(5.854)} > F_{(3.84)}$, then H_0 (null hypothesis) is rejected and H_1 (alternative hypothesis) is accepted.

The test therefore leads to the conclusion that there are differences in the preferred mode and the effectiveness of the e-learning platform for teaching. That is, the preferred mode is a function of the effectiveness of the platform for teaching. Students would only prefer online or face-to-face depending on the effectiveness of teaching.

IV. DISCUSSION OF FINDINGS

In line with studies previously carried out by, [7], students at Covenant University affirmed that they had heard of these online learning resources and made use of them before the online pandemic lockdown classes. The findings revealed that students at Covenant University made use of the Zoom, and Moodle resources more than the students at the University of Lagos. However, the findings revealed that the use of Google Classroom was more popular at the University of Lagos than at Covenant University. The WhatsApp platform was not so much in use compared to how much it was used in the University of Lagos. Also, Telegram was more popular in use in Covenant University compared to how much it was used in the University of Lagos. This can be attributed to the fact that telegram has always been in use at Covenant University. Lecturers and students utilized this platform for the purpose of communication for academic-related activities. The findings also revealed a high level of use in Covenant University due to its use before the pandemic lockdown.

Findings from the study revealed that students at the University of Lagos made use of a smartphone for their e-learning classes more than students at Covenant University. This explains that smartphones are not allowed in some Nigerian private schools of which Covenant University is inclusive. This is also supported by study findings, that laptops were utilized more frequently at Covenant University than at the University of Lagos. The study, [27], revealed that 86% of students who have at least one smartphone device use it for academic work. However, this may not totally be true because one of the standing rules in Covenant University is the restriction on the use of smartphones, which is established in a bid to avoid distraction for students, to maximize the utmost concentration on their academics. Also, smartphones are not the only devices that can be used to achieve academic efficiency and improve academic outcomes.

Findings further revealed that erratic power supply and limited financial capability were more of a challenge for students at the University of Lagos than the other. In line with, [28], unstable electricity, especially, the high cost of data bundles, skill, and competency have been affirmed to cause hindrances for students during the e-learning processes in the pandemic. Also, studies revealed that unstable internet access, no access to at the University of Lagos had financial difficulties due to the high cost of data, as compared to students at Covenant University, while purchasing data bundles for their online courses.

Also, motivation appeared to be more of a challenge for students at Covenant University than their counterparts.

However, students in Covenant University, are affirmed to have a heavy workload during the pandemic unlike students in the other school, and this is in line with studies by, [31]. This could be because of the maximum participation and the constant engagement of students in Covenant University by their lecturers even before the pandemic. In terms of communication with their lecturers, students at Covenant University seemed to have this challenge than their counterparts at the University of Lagos, and this is also in tandem with recent studies by, [30].

According to, [19], students at the University of Lagos affirmed to have limited skill and competence with the use of e-learning platforms, unlike students in private schools. Students at Covenant University were also revealed to be more distracted than those at the University of Lagos.

The hypothesis tested also revealed that there were differences in the preferred mode and effectiveness of the e-learning platform for teaching. That is, the preferred mode is a function of the effectiveness of the platform for teaching. Students would only prefer online or face-to-face, depending on the effectiveness of teaching.

V. RECOMMENDATIONS

The study recommends an intensive investment in electricity by the Nigerian Government for a stable supply of power. The economic growth of a nation is closely tied to its ability to provide steady electricity for enhanced productivity. By extension, this impacts positively on the educational sector

where electrical gadgets and e-learning resources can be utilized with no interrupted power supply.

The result of this study recommends to the Nigerian Government to increase the budgetary allocation on education. The United Nations Children's Fund (UNICEF) has faulted the Nigerian's Budget on education for 2022, which should have been 8.4 percent, an equivalent of the country's total annual budget as against the 5.4 percent allocation. For an increase in budget, the government must perceive education as the sector to boost other sectors of the economy. So, this implies that the impact of underfunding the educational sector will be reflected in the underfunding of the economic sector in a few years to come.

The findings from this study recommend to relevant authorities such as institution administrators, members of staff in the Ministry of Education, and policymakers, on the importance of incorporating technology in education. This will enhance the maximum engagement with the use of e-learning for undergraduates in Nigerian universities. The use of technology should be promoted more intensely to help students become more knowledgeable about the use of e-learning. Training programs on online teaching should also be offered to members of staff in both public and private tertiary institutions. This will help members of staff to be adequately equipped with the requisite skills needed to impact knowledge via e-learning when the need arises.

VI. CONCLUSION

The study concludes that there is a need for more intensive ICT (Information and Communication Technology) Training sessions for Nigerian Students, with the use of e-learning resources, including, Zoom, Moodle, Microsoft Teams, and Coursera.

The study concluded by comparing the preferred mode of learning between face-to-face learning and e-learning mode. It revealed that students would only prefer online or face-to-face depending on the effectiveness of teaching.

ACKNOWLEDGMENT

All authors acknowledge Covenant University, the funding sponsor, CUCRID (Covenant University Centre for Research, Innovation, and Discovery) for financial support of this paper.

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Contribution of individual authors to the creation of a scientific article (ghostwriting policy)

Adelowo Oluwatobi wrote and investigated the study.

George Luton has organized and executed the experiments of Section 4.

Toluope Allo supervised the research, organized and edited the manuscript.

Emmanuel Amoo was responsible for the Statistics and interpretation.

Tayo George participated in the technical editing of the manuscript.

Sources of funding for research presented in a scientific article or scientific article itself

All authors acknowledge the funding sponsor, Covenant University, the Covenant University Centre for Research, Innovation and Discovery (CUCRID) for the support of the research paper.

Conflict of Interest

The authors have no conflict of interest to declare that is relevant to the content of this article.

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