COVID-19 AND THE E-LEARNING CHALLENGES EXPERIENCED BY ARCHITECTURE STUDENTS OF A TYPICAL NIGERIAN PRIVATE UNIVERSITY

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Abstract

The outbreak of COVID-19 the world over brought about an abrupt change to every facet of life. The higher education sector was not left out of the pandemic's impact. Universities in developing nations migrated from traditional face-to-face learning to e-learning suddenly with very little preparation and training. Stakeholders within private tertiary institutions of Nigeria experienced many challenges in the 2019/2020 and 2020/2021 sessions. The impact still shapes research, administration and learning in Nigerian universities. This study investigated the challenges experienced by the Caleb University architecture students on the e-learning platform during the lockdown in the year 2020 with the view to developing a framework for future application of e-learning in tertiary institutions in Nigeria. The methodology engaged quantitative and qualitative methods of enquiry, with a students' population (N=217) considered for this study. Also, close-ended questionnaires based on Sloven's sample size (n=69) determination were administered, and a quota sampling technique was adopted. The SPSS software was used in the data analysis. Results indicated a causal relationship between specific amenities and a good learning experience. The result revealed that poor internet sources (connectivity) and insufficient power supply hindered a good e-learning experience. The results suggest a need for infrastructural development at university, sectorial, regional and national level in Nigeria, to cope seamlessly with the trend of migration to a digital world.

Keywords: Architecture Student, Covid-19, E-learning, Face-to-face learning.

1 INTRODUCTION

The outbreak of the highly infectious disease coronavirus (Covid-19) brought about an abrupt change to human living, which led to the shutdown of conventional human movement and activities to check the spread of this disease [1; 2]. Educational institutions such as universities were not left out of the sudden lockdown. The school closure forced by the pandemic consequently had an effect on university research, administration and teaching which by extension had an effect on students' growth, learning and development [3]. In ensuring continuity in learning, many private and a few public tertiary institutions during the lockdown migrated from conventional physical learning (face-to-face) to e-learning [3, 4]. The transition to e-learning was seen to be more prevalent among private universities in Nigeria during the COVID-19 pandemic. This was seen as a means of ensuring minimal disruption to the academic calendar.

E-learning is a common educational system employed by many institutions in the global north supported by information technology [5, 6]. Covid-19 has revived the need for the e-learning experience more than ever before [3]. The advantages of e-learning in higher education can never be overemphasised. However, its adoption and usage are challenging for several universities, predominantly in developing countries [6].

Diverse studies exist on the challenges of e-learning [7; 3; 4; 8]. The current study seeks to add to the existing literature on e-learning in architecture of private universities in Nigeria. The pandemic has brought about several changes and new experiences that need to be documented and analysed. Therefore, this study investigated the challenges experienced by the Caleb University architecture students on the Microsoft Teams e-learning platform during the lockdown in the year 2020 with the view to developing a framework for future application of e-learning particularly in architectural education in tertiary institutions in Nigeria. The core objective of the study was to identify the e-learning challenges experienced by the Caleb University architecture students during the lockdown.

Architecture as a course in a tertiary institution was chosen considering the widely held notion by the Architects Registration Council of Nigeria (ARCON) and other notable regulatory agency that the discipline is meant to be taught by face-to-face learning [9]. Based on this assumption, more challenges are expected to be experienced by taking this course online. The choice of Caleb University for this study is premised on its location of being in Lagos state, one of the most populated states in Nigeria and highly cosmopolitan with the presence of information technology companies. Also, Caleb University is a typical Nigerian private institution that migrated fully online during the lockdown [10].

2 LITERATURE REVIEW

E-learning is the employment of modern technologies for education, which plays a significant role in the development of the workforce in meeting developmental goals [6]. Similarly, Adeoye et al. (2020) defined e-learning as an electronic learning method associated computerised interactive interface convenient for both learners and lecturers. Parks [1] suggests the word "e" in e-learning to represent "everything, everyone, engaging and easy" in addition to "electronic". The globally permeating presence of e-learning makes adoption easy in the face of the COVID-19 pandemic. The adoption of e-learning can be achieved through diverse e-learning platforms. They include Microsoft teams, skype, Google classroom, adobe captivate, Google hangout, zoom, WhatsApp, to mention a few.

According to [11], some of the advantages of e-learning include easy access to information, higher content delivery; personalised instruction; content standardisation; accountability and on-demand availability. Other advantages are self-pacing, interactivity, the convenience of use and confidence. The benefits of e-learning notwithstanding, developing countries are still at the elementary adoption stage, and diverse challenges characterise this. [12] posit that 45% of e-learning ventures are a total failure in developing countries, 40% partial, and only 15% can be described as successful. The e-learning challenges vary from country to country based on culture, context and level of preparedness [3].

For example, [4] classified the e-learning issues faced by students in Ghanian tertiary institutions during the lockdown of 2020 as accessibility related, social, lecturer related, academic-related and generic related. [3] classified e-learning challenges under four headings as technical, individual, cultural, and course challenges. [12] identified technological issues as the critical challenge facing e-learning systems. [13] in Kenya identified the inadequacy of ICT infrastructure, lack of technical skills and financial constraints. [7] in Saudi Arabia identified 16 important barriers to e-learning and categorised them under four headings as student-related, instructor related, infrastructure-related and institutional management related.

According to [6], the challenges facing Nigerian universities' e-learning technologies include inadequate cyber café security, insufficient human resources for e-learning training, poor internet facilities, and high cost of e-learning hardware. Other are poor electricity supply, inadequate funding of e-technologies and insufficient computers for users in the institutions. In a general context of developing countries, [6] categorised e-learning obstacles under four headings as connectivity, equipment, software and training. On pharmacy education in Kaduna, Nigeria, [14] identified the e-learning challenges encountered as poor infrastructural availability, inadequate academic staff training in ICT, poor access to quality teaching resources, and high internet data cost subscription. Others are poor internet connectivity, lack of self-discipline to study and poor learning environment.

Similarly, [15] on medical education posits e-learning challenges in public institutions under two headings of institutional related and student-related challenges. According to [15], the related institutional challenges are industrial strikes embarked upon by staff, poor funding and administrative capacity, absence of e-learning facilities, and lack of technical support and knowledge. The student-related challenges are the non-ownership of the device, the high cost of internet subscriptions, and the epileptic power supply. Also, [1] identified challenges of e-learning in Nigerian universities during the pandemic as poor power supply, high cost of internet subscription, poor internet accessibility, high cost of computers and laptops. Others are lack of training, absence of physical interaction and economic factors.

According to [16], e-learning challenges identified while teaching technical courses requiring practical hands-on sessions during the covid-19 pandemic are five. They are non-availability and poor IT infrastructure, unstable electricity, high cost of internet subscription, inadequate IT skills by educators and learners, and inability to handle practical processes online. Judith [6] posits students' challenges in e-learning classes as lack of confidence and experience with computers, lack of skills in commonly used applications, and lastly, time management, skills and self-motivation. Table 1 summarises the e-learning challenges from the literature reviewed.

Table 1 presents seven key challenge categories gleaned from literature concerning the e-learning experience during the global lockdown in 2020. Two studies identified hardware related issues such as inadequate cyber café security, high cost of e-learning hardware, and lack of confidence and experience with computers. In contrast, one study identified software related issues. Four studies identified poor internet connectivity as an e-learning challenge, while five identified electricity-related problems. Also, five studies mentioned related institutional issues extensively, while three studies identified socio-cultural challenges. Lastly, four studies identified economic-related challenges that deal directly with users financial constraints.

Based on the review of literature from Nigeria considering the study location and [3] assertion that e-learning challenges are contextual, a focus group discussion will be presented in the next section to determine the main challenges for a quantitative survey.

Table 1. Summary of e-learning challenges review.

S/N	Challenge	Description	Literature
1	Hardware-related	Inadequate cyber café security High cost of e-learning hardware Lack of confidence and experience with computers	[6], Judith [6]
2	Software related	lack of skills in commonly used applications	Judith [6]
3	Internet Connectivity	Poor internet facility Non-availability and inadequate it infrastructure,	[6], [14], [1], [16]
4	Electricity related	poor electricity supply.	[6], [14], [15], [1], [16]
5	Institutional related (Training/ Administration)	Insufficient human resources for e-learning training Poor infrastructural availability, Inadequate academic staff training in ict, Poor access to quality teaching resources, Poor learning environment The industrial strike embarked upon by staff, Insufficient funding and administrative capacity, Absence of e-learning facilities, Lack of technical support and knowledge, Lack of training, Non-availability and poor it infrastructure,	[6], [14], [15], [1], [16]
6	Social/Cultural	Time management & self-motivation Lack of self-discipline to study Absence of physical interaction Inability to handle practical processes online.	[14], [6], [16]
7	Economic related (Cost on the student)	High cost of data for internet subscription Poor learning environment Non-ownership of device, High cost of computers and laptops.	[14], [15], [1], [16]

3 METHODOLOGY

The study is a case study research in which the mixed-method research design was adopted [17]. The methodological framework for the study consists of three distinct phases [3]. Phase one was the literature review of e-learning challenges from Nigeria, which was conducted in the previous section. The second phase was a focus group discussion in which four departmental experts with e-learning experience and actively involved in the covid-19 online teaching was conducted. This was a preliminary study conducted to fine tune the survey instruments deployed in third phase [7]. The third phase was a questionnaire survey containing the nine selected significant e-learning challenges applicable to the Architecture department of Caleb University. The questionnaire adopted a five-point Likert scale ranging from 1=' Not Challenging' (NC) to 5=' Very Challenging' (VC).

Purposive sampling was employed to select Caleb University, a private university in Nigeria that actively took part in e-learning during the covid-19 lockdown. The Sloven's formula was used to determine the maximum statistically valid sample size. The population size (N)=217, and sample error (e)=0.1 (90% confidence level). A total of 69 respondents were arrived at as the sample size (n). Eighty questionnaires were distributed to the users using the quota sampling method. A total of 65 valid responses, representing about 81% of the distributed questionnaires were returned and used in the study analysis.

3.1 Preliminary survey instrument review

Table 2 presents the decisions of the focus group discussion carried out on the e-learning challenges gotten from the literature review. The four experts involved were lecturers from the department of architecture, Caleb University, with requisite experience in research and e-learning. They were actively engaged online during the covid-19 lockdown as level advisers, examination officers, and lecture facilitators.

Table 2. Focus group discussion table.

S/N	Challenge	Description (Challenges)	Decision
1	Hardware-related	i. inadequate cyber café security	No
		ii. high cost of e-learning hardware	Yes
		iii. lack of confidence and experience with computers	Yes
2	Software related	i. lack of skills in commonly used applications	Yes
3	Internet Connectivity	i. poor internet facility	Yes
		ii. non-availability and poor IT infrastructure,	No
4	Electricity related	i. poor electricity supply,	Yes
5	Institutional related (Training/ Administration)	i. insufficient manpower for e-learning training	No
		ii. poor infrastructural availability,	No
		iii. inadequate academic staff training in ICT,	No
		iv. poor access to quality teaching resources,	No
		v. poor learning environment	No
		vi. the industrial strike embarked upon by staff,	No
		vii. insufficient funding and administrative capacity,	No
		viii. absence of e-learning facilities,	No
		ix. lack of technical support and knowledge,	Yes
		x. lack of training,	No
		xi. non-availability and poor IT infrastructure,	No
6	Social/Cultural	i. Time management & Self-motivation	Yes
		ii. lack of self-discipline to study	No
		iii. Absence of Physical Interaction	No
		iv. inability to handle practical processes online.	No
7	Economic related (Cost on the student)	i. high cost of data for internet subscription	No
		ii. poor learning environment	No
		iii. non-ownership of device,	No
		iv. high cost of computers and laptops.	No

Under the hardware related issues presented in Table 2, the experts selected the high cost of e-learning hardware and lack of confidence and experience with computers as e-learning challenges observed among students. The students are known to be more familiar with face-to-face learning. On the issue of software, lack of skills in commonly used applications such as Microsoft Teams in combination with other software was considered a challenge. Electricity supply was considered a significant challenge synonymous with Nigeria as a whole. At the same time, under related institutional matters, experts selected a lack of technical support and knowledge as a challenge. This was attributed to the students' frequency of calls during the e-learning sessions for login details and confirmation of registration status. The experts selected time management and self-motivation as an observed challenge regarding socio-cultural related issues. No issue was chosen under the economic category as students (private) must have a personal computer upon enrollment. Also, a reasonable number of the students in the private university are from average to above average families. Fewer complaints were received in this regard.

In summary, seven items were selected as challenges from the list presented. However, the experts, based on the experience of the peculiarity of the study location, recommended two challenges:

i. Distraction associated with working in an uncontrolled environment: Several students reported domestic chores, a distraction from families and friends during the online classes.

ii. Online distractions during the e-learning classes.

Consequent to this addition, the total number of e-learning challenges identified by the experts was nine for the questionnaire survey.

4 RESULTS

4.1 Demographics of respondents

Table 3 presents the demographics of respondents in frequencies and percentages.

Table 3. Demographics of respondents.

		Frequency (65)	***Percentage (%)***
Gender	Male	42	64.6
	Female	23	35.4
Age Group	20 years and below	24	36.9
	21 -30 years	39	60.0
	41 - 50 years	1	1.5
	51 and above	1	1.5
Current level of study	200 level	17	24.4
	300 level	21	31.0
	MSc 1	13	19.3
	MSc 2	18	25.3
Length of e-learning experience	One month	15	23.1
	Two months	5	10.8
	Three months	14	21.5
	Four months	31	47.7

The gender distribution in table 1 shows that 64.6% of the respondents are male, while 35.4% are female. This is similar to a study by [18] on a student's survey study. This is not surprising as the architectural profession is often male-dominated. The age group of respondents shows that 36.9% are 20years and below; the majority (60.0%) are between the age group of 21-30years. Also, 1% each is within the age groups of 41-50years and 51 and above, respectively. The respondents' age distribution shows that the majority are below 30years of age as expected for undergraduate and postgraduate students in a programme that runs both tiers before they go for the mandatory service year. It is evident from the current level of study of the respondent that 24.4% are in 200level, 31.0% in 300level, 19.3% are in their first year postgraduate study, while 25.3% are in the second year of postgraduate school. The quota sampling was applied in arriving at this distribution. The current 400level students not represented were not part of the e-learning classes as they were on industrial attachment during the covid-19 pandemic. Their level of study is also an indication that they have experienced the face-to-face learning of architecture. On the length of e-learning experience of the respondents, 23.1% had one month experience, 10.8% had two months experience, 21.5% had three months experience. In comparison, most (47.7%) of the respondents had four months of experience. This indicates that a more significant percentage of the respondents were fully involved in the e-learning semester and can be trusted for assessment based on experience.

4.2 Users identification of e-learning challenges

Table 4 presents the users assessment of the e-learning challenges recommended by the experts in subsection 3.1.

Table 4. Users identification of e-learning challenges.

E-Learning Challenges	USERS' ASSESSMENT %				
	Not challenging (1)	Somewhat not challenging (2)	Neutral (3)	Somewhat challenging (4)	Very challenging (5)
1.High cost of e-learning hardware	53.8	13.8	9.2	20.0	3.1
2.Lack of confidence and experience with computers	84.6	7.7	4.6	0	1.5
3.Internet connectivity	18.5	4.6	18.5	23.1	35.4
4.Lack of skills in commonly used applications such as Microsoft Word, Excel, Forms, Teams	64.6	13.8	16.9	4.6	0
5.Time management and self-motivation	24.6	10.8	33.8	12.3	18.5
6.Inadequate supply of electricity	23.1	9.2	15.4	30.8	21.5
7.Distraction associated with working in an uncontrolled environment	26.2	7.7	6.2	35.4	20.0
8.Online distractions during the e-learning classes	26.2	9.2	33.8	12.3	18.5
9. lack of technical support and knowledge,	10.8	7.7	0	6.2	15.4

The result of respondents on the cost of e-learning hardware presented in Table 4 shows that the majority (53.8%) found it not challenging, 13.8% found it somewhat not challenging, while 9.2% of the respondents were indifferent about cost. Also, 20% of the respondents considered the cost of e-learning hardware as somewhat challenging, while the remaining 3.1% found it very challenging. The result suggests that the cost of e-learning hardware was not a significant challenge to these respondents from a private university. This can be attributed to the e-learning hardware being not limited to desktop computers or laptops alone. Other devices such as smartphones can also be used.

On the issue of lack of confidence with computers, the majority (84.6%) of the respondents found it not challenging, 7.7% found it somewhat not challenging. In comparison, 4.6% were indifferent about the confidence and experience with computers, and only 1.5% of the respondents found it challenging. This result is not surprising as the institution students take computer-related courses in 100 and 200 levels under general studies. They have been actively involved in using e-learning devices in general before the covid-19 lockdown.

The result on internet connectivity presented in Table 4 shows that 18.5% of the respondents found it not challenging, 4.6% found it somewhat challenging, while 18.5% were neutral. Furthermore, 23.1% of the respondents found internet connectivity somewhat challenging, while 35.4% found it very challenging. This indicates that most of the respondents (58.5%) found internet connectivity a major challenge during the covid-19 lockdown. The result can be attributed to the uneven spread of internet provision by the service provider and the remote location of the respondents. Also, this situation can be attributed to heavy traffic on the internet due to the sudden migration of subscribers' regular face-to-face business to the internet during the covid-19 lockdown.

The result in Table 4 on lack of skills in commonly used applications revealed that most (64.6%) of the respondents found it not challenging, 13.8% found it somewhat not challenging. In comparison, 16.9% of the respondents were neutral on the subject. Only 4.6% of the respondent found having the requisite skills in software somewhat challenging. The result suggests that the majority (78.4%) of the respondents are familiar with the software used, and the Microsoft Teams platform used by the institution was user-friendly. Also, the age group of respondents, which is predominantly below 30years of age, is best described as the "jet age" with outstanding interaction with information technology.

On the issue of time management and self-motivation, 24.6% of the respondents found it as not challenging, 10.8% found it as somewhat not challenging, and 33.8% of the respondents were neutral on the subject. Also, 12.3% of the respondents found time management and self-motivation somewhat challenging, while the remaining 18.5% of respondents found it very challenging. The result suggests that time management and self-motivation were not respondents' significant challenges during the e-learning. This can be attributed to the institution's already prepared schedule; the restriction of movement kept people within their immediate environment.

The result in Table 4 on the inadequate electricity supply shows that 23.1% of the respondents found it not challenging, and 9.2% found it somewhat challenging. In comparison, 15.4% of respondents were neutral on the subject. The result also shows that 30.8% of the respondents found the inadequate electricity supply somewhat challenging, while the remaining 21.5% found it very challenging. This indicates that approximately 52.3% found the inadequate supply of electricity a significant challenge of e-learning. This can be attributed to the poor supply of electricity experienced widely in Nigeria. Lectures online are held during the day, and an average family in Nigeria will rarely put on a power generating set during the day because of the running cost. E-learning devices need the power to remain functional.

The result presented in Table 4 shows that 26.2% of the respondents considered distraction associated with working in an uncontrolled environment not challenging, 7.7% considered it somewhat not challenging. In comparison, 6.2% of the respondents were neutral on the subject. Also, 35.4% of the respondents considered the distraction somewhat challenging, while the remaining 20.0% considered it very challenging. In summary, the result indicates that approximately about 55.4% of the respondents considered this distraction as an e-learning challenge. A total of 95.5% of the respondents responded to the question. This situation can be attributed to other family members involved in activities that distract the student while in online classes. Students could even be multi-tasking while online. For example, cooking in the kitchen while receiving lectures can lead to divided attention.

The result in Table 4 on online distraction during the e-learning classes revealed that 26.2% of the respondents considered it not challenging, 9.2% considered it somewhat not challenging, while 33.8% of the respondent were neutral on the subject. The result also revealed that 12.3% of the respondents considered online distraction during e-learning classes somewhat challenging, while the remaining 18.5% respondents considered it challenging.

Lastly, on the lack of technical support and knowledge, the result presented in Table 4 revealed that a total of 40.1% of respondents responded. However, 6.2% considered this issue somewhat not challenging, while 15.4% of the respondent considered it very challenging. In summary, only 21.6% of the respondents considered the lack of technical support and knowledge as a challenge. The result suggests that the institution provided technical support to ensure the smooth running of the e-learning classes during the covid-19 pandemic lockdown.

In summary, based on the results presented in Table 4, the e-learning challenges considered most challenging by the respondents in this study are internet connectivity, inadequate supply of electricity, and distraction associated with working in an uncontrolled environment.

5 DISCUSSIONS

First, the consideration of internet connectivity as an e-learning challenge based on the findings of this study conforms with findings of previous studies by [6],[13],[1],[16], and [4]. However, this is not in conformity with Judith [6], [13], and [3]. The studies that conform to this study's findings are predominantly from Nigeria. This implies that internet connectivity in Nigeria is yet to achieve total coverage. This can be linked possibly to rural and urban locations. Internet coverage is more concentrated in the urban centres with a good population and robust commercial activities, while the rural areas have fewer activities for service providers to consider the heavy investment of internet provision. Also, heavy traffic on the internet corridors during working hours is possible, resulting in slow and poor accessibility even in the urban centres. This can be seen in the bonuses often offered by internet service providers at off-peak periods. Another possibility for poor internet accessibility affecting e-learning during the lockdown can be attributed to the migration of several offices and businesses to the virtual space against the traditional physical work culture. Students engaged in e-learning are spread across Lagos and Nigeria and fall into different internet accessibility zones.

Secondly, inadequate supply of electricity as an e-learning challenge in this study conforms with [6], [14], [1], and [16], which are previous studies from Nigeria. This challenge can be synonymous with the Nigerian society with low power generation over the years. Virtually every average home in Nigeria owns a private power generating set for her power supply to make up for the shortfall usually experienced. However, they are turned on mainly at night considering the high cost of running. The e-learning sessions were held primarily during the day and were not sustainable joining the e-learning classes running on generating set. There are several instances of students missing e-classes due to an inadequate electricity supply.

Lastly, the distraction associated with working in an uncontrolled environment as an e-learning challenge does not confirm with most previous studies from the same country (Nigeria). However, it is tied to

cultural orientation and students' available workspace. Students receiving lectures from a mobile device have the temptation to multi-task once the video mode is switched off. This reduces their level of concentration. Families and friends around during e-learning classes can distract the students with other issues, and there is a high tendency to lose a good percentage of the e-learning, making the process not impactful.

6 CONCLUSIONS

This paper contributes to identifying the challenges faced by users on the e-learning platform of a typical Nigerian private university during the covid-19 lockdown. The finding of this study is based on empirical evidence and supports the position of other researchers on the e-learning challenges faced by mainly developing countries. The study identified: (1) Poor power supply, (2) poor internet connectivity, and (3) distraction associated with working in an uncontrolled environment. These challenges are infrastructural and socio-cultural behaviour related. The study recommends that the effective adoption of e-learning goes beyond the university administration only. Infrastructural development is also essential at the sectorial, regional and national levels.

The study is a case study of a single department in a private university. As such, the result cannot be generalised. Further studies can be carried out across departments within the same university or similar departments from another university. Also, similar studies can be carried out among tertiary institutions within a state or the country. However, the framework of this study can be adopted for future studies.

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