

## **E-Learning in the Era of COVID-19 in Nigerian Tertiary Institutions: Opportunities and Challenges**

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### **Abstract**

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**A**nchored on exploring the opportunities and challenges of e-learning during COVID-19 pandemic in Nigeria, the study posited that COVID-19, has considerably made e-learning imperative in the tertiary institutions in Nigeria regardless of the fact that digital learning has not been fully implemented in most tertiary institutions. The study depended on secondary sources of data. It utilized technological determinism theory and employed content analytical technique. Its findings established that e-learning provided the opportunities of education without barrier, cost reduction, efficiency and effectiveness as well as convenience in learning. It equally uncovered that inadequate funding, epileptic power supply, high cost of information communication technology facilities, low expertise of lecturers and inadequate knowledge of e-learning by the students in tertiary institutions are key factors undermining e-learning. In the light of the foregoing, the paper recommended adequate funding of e-learning, public private partnership investment on electricity, a regulatory policy on the charges of ICT providers and data services, and prioritization of to the training and retraining of lecturers.

**Keywords:** *E-learning, COVID-19, tertiary institutions, Fragile State.*

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### **Background to the Study**

Corona virus pandemic, with its spread around the globe was a great source of worry because of the continuous increase in the number of victims and diseased. As a way of containing its spread and ensuring personal protection, measures such as social distancing and lockdown were adopted (Nguyen, Enos, Vandergriff, Vasqu Cruz, Jacobs and Manskar, 2020). These measures disrupted the face-to-face teaching and learning in the educational system worldwide leading to the full adoption and intensification of e-learning method in the tertiary institutions (Adeoye, Adanikin and Adanikin, 2020).

In Nigeria, the Federal Government Instructed schools to commence online teaching or virtual learning with the notion that it would guarantee great interaction and collaboration, provides wide coverage, academic convenience and efficiency as well as reduce the cost of education. In line with this, Ajabi, Salawu and Adeoye (2008) write that the excellence achieved by National Open University of Nigeria in teaching and learning is much connected with e-learning where lecturers and students interface. Tutored marked assignments are done online, students write virtual exams, just as projects submission and defence are often done online too.

It is important to note that COVID-19 pandemic exposed the weakness of Nigeria's analogue mode of teaching as many tertiary institutions are not e-learning driven and compliant (Lukeman, 2020). With the exception of few tertiary institutions mostly private institutions like American University of Nigeria (AUN), Adeleke University, Covenant University among others, who made significant progress in e-learning during COVID-19 pandemic in Nigeria, several of the public tertiary institutions suspended academic activities without any remarkable effort to adopt e-learning solution despite its opportunities (Idris, 2020).

However, the level of e-learning has remained at a low ebb despite efforts to intensify e-learning in Nigeria. This is probably not unconnected with inadequate funds, epileptic power supply, high cost of information communication technology facilities, low expertise of lecturers etc. These factors according to Nwachukwu, Ugwu and Wogu, (2021) have made it difficult for many tertiary institutions to totally embrace e-learning during COVID-19 in Nigeria. It is, therefore, against the foregoing that this paper is streamlined to underline the opportunities and challenges of e-learning in the tertiary institutions in Nigeria during COVID-19 pandemic.

### **COVID-19 Pandemic**

COVID-19 is a highly transmissible and pathogenic viral infection caused by severe acute respiratory syndrome (Shereen, Khan, Kazuri, Bashir and Siddique, 2020; Nwankwo and Afoke, 2020). It emerged first in Wuhan city in China in 2019. Due to its high potency of transmission from person to person through contact with droplet of an infected person, the World Health Organization declared it a public health emergency of international concern (WHO, 2020). Since then, the virus has continued to spread in all the continents and across all the countries (Omaka-Amari, Aleke, Obande-Ogugia, Ngwakwe, Nwankwo and Afoke, 2020). As a result, the world was faced with lockdown and social distancing, among other

measures as means of containing further spread of the virus which disrupted the educational system especially in the tertiary institutions leading to the adoption of e-learning.

In Nigeria, the school system came to stand still in 2020 and almost lost a whole academic session due to the pandemic. Within this period, there was a total constraint on the face to face method of teaching as a result of school shutdown which necessitated the adoption of e-learning (Brand, 2020). This development increased the awareness of government on the opportunity of e-learning in the delivering of lectures for educating the tertiary institutions' students. Despite the Federal Government directive for schools to switch to e-learning in Nigeria, many tertiary institutions hardly coped with it during the COVID-19 pandemic. And the inability has set many tertiary institutions backward in the completion of the academic calendars.

### **E-Learning**

E-learning is electronic method of learning which is associated with computerized learning in an interactive interface at the convenience of both learners or students and lecturers (Adeoye, Adanikin and Adanikin, 2020). The process and applications of e-learning technology include computer-based learning, web based learning, virtual learning, blending learning, hybrid models, internet learning, network learning, tele-learning, computer assisted learning and online classroom and digital collaborations where contents are delivered via the internet, intranet/extranet, audio and or video tapes, satellite TV and CD-Rom (Ukoha, 2007 cited in Amphina, 2020).

Similarly, Moore, Dickson-Deane and Dalwen (2020) see e-learning as the use of web based technology tools along with materials available on CDs, the internet, video-tapes and television broadcast. For Oye, Salleh and Iahad (2011), e-learning is seen as the use of information communication technology (ICT) to enhance and support teaching and learning process. It is, therefore, the holistic incorporation of mode telecommunication equipment and information telecommunication technology (ICT) resources with the education system.

From the definitions above, e-learning is the application of ICT equipment's and facilities in the learning process with the purpose of enhancing learning and lecturing process in the educational sector. It involves the use of ICT devices in the learning process. However, the aim of e-learning in the higher institutions according to Santa de Oliveira, Torres Penedo and Pereira (2018) includes:

1. Provision of educational opportunities for the less privileged ones due to political, economic, geographical or social reasons
2. Providing the learners with the flexible schedule to fit to the conditions and circumstances for varied students such as house wives, farmers, industrialists, and employees.
3. Redefining education through scientific and technological revolution in order to help learners achieve competence through continuous education and self-learning
4. Introducing new specialties that society needs which the traditional college systems do not allow and support to achieve

5. Providing citizens with cultural programs and knowledge which gives them the benefits of information communication technology.
6. Creating educational conditions that are suitable to cater the needs of learners.

### **Methodology**

The necessary data required to prosecute this study were sought from secondary sources. For this purpose, books, journals, newspapers, textbooks, internet materials, conference papers and documents constitute sources of data for the study. Rigorous method of content analysis of written records and documents was adopted. This technique is employed because it allows research on areas where the researcher cannot have physical access of the respondents.

### **Theoretical Framework**

This study is wrapped on technological determinism theory. Popularly developed by Thursteen Veblen, an American Sociologist cum economist, which was followed by scholars such as Clarence Ayres, John Dewey, William Ogburn and Lanadon Winner (Technological Determinism, 2021). Technological determinism theory is a reductionist theory that seeks to provide a causative link between technology and society; what could have a controlling power in human affairs.

Basically, the technological determinism theory parades the following assumptions as noted by Thursteen Veblen:

1. Technology defines the nature of society
2. Technology is the driving force of culture in a society.
3. Technology determines the people's course of history (Communication Theory, 2021).

It could be deduced from the foregoing that technological development and innovation is the principal motor of social, economic and political changes. (Smith & Marx, 1994). Put differently, technology through e-learning device is a key changing force in the society as it advances, modernizes and improves the process of teaching and learning. Hence, Bimber (1990) would have us believed from the works of Karl Marx that technological progress leads to newer ways of production in a society and this ultimately impacts positively on the cultural, political and economic spheres of a society.

Technological determinism theory is apt in this study. This is because physical teaching is speedily giving way for the use of e-learning as a major means of containing the spread of COVID-19 pandemic. It creates opportunity for lecturers and students interface regardless of space and distance. It provides wide coverage, academic convenience and efficiency as well as reduction of cost of education. Thus technology has made it possible for educational institutions in societies to switch to e-learning in order to salvage the educational sector which has become a new normal as it is believed that any society that fails to embrace it would be left out in global social, economic, and political relations with the world.

### **Empirical Studies**

Ntshwarang, Malinga and Losike-Sedimo (2021) focused on e-learning tools at the University of Botswana in view of the COVID-19 crisis. The paper posited that information technology is presently a highly sought component of every higher learning institutions 'towards e-learning mode of instruction and knowledge acquisition. Furthermore, the author maintained that e-learning encompass multiple technology and internet based learning platforms that requires computer literacy from both learner and instructors as it offers more flexibility and comfort as instruction and learning occurs at any time and at the user's preferred environment. The article was a qualitative method based on the information from the literature review, author's experience and observations. The paper observed from its findings that poor infrastructural development and poor access to internet by the higher tertiary students, poor preparation of staff and poor attitude towards e-learning are the difficulties that e-learning faces in Botswana. The paper call for government intervention and partnership with the core stakeholders to put measures in place that will take care of the challenges of e-learning in the tertiary institutions. This article is a resourceful material because of its ability in providing the background, types, relevance, use, advantages and the challenges associated with e-learning under COVID-19 crisis.

Kaisara and Bivalya (2021) were involved in the study of the investigation of e-learning challenges faced by students during COVID-19 in Namibia with the aim of establishing student's experiences with the e-learning mode during the COVID-19 lockdown in Namibia and showed the results of an online survey of 137 undergraduate students about their experiences, using e-learning technologies during the COVID-19 induced university closures. The paper maintained that e-learning has become very popular in the last two decades and has been embraced across the globe as a tool to enhance accessibility' and affordability of higher education. Furthermore, the authors noted that e-learning became very popular and all-embracing in higher institutions during the COVID-19 lockdown period in order to circumvent lockdown and social distancing. The study created an online survey on Google forms and a link distributed to students through WhatsApp class groups. The data were analyzed with the use of frequency tables and figures, while thematic content analytical tool was employed in data analysis. The results of the study revealed that mobile device remained the primary computing device used to access academic information. Also, the results showed the emergence of five themes, namely. e-learning system accessibility, e-learning platform layout, resources to access internet and network. Isolation and home environment that captured student challenges with online classes. The study recommended effective mobile learning. The results of this study may not be generalizable but it provides a novel perspective as they report on perspectives of respondents who did not adopt e-learning volitionally nor opted for such a mode, but rather, were compelled by the circumstances around COVID-19. Besides that, the respondents in the study were all enrolled /or one programme and the majority of them were first year students, it may be possible that some students had yet to be fully socialized into the university systems, thus magnifying the perceived ill functionalities of the e-learning system.

Nwachukwu, Ugwu and Wogu (2021), looked at digital learning in post COVID-19 era. The paper argued that quality education is under threat since COVID-19 pandemic has disrupted the academic activities owing to its social distancing rule leading to the embracing of digital learning for the sustenance of academic activities. The paper adopted evaluative theory as a theoretical tool and utilized documentary research method using data from the 2018 economic intelligence unit. The analysis of secondary sources of data showed though meaningful efforts has been made by few of the private universities but the public universities are not good enough for full implementation of digital learning. The study suggested liberalization of the educational sector from the bureaucratic bottleneck that has bedeviled its transformational development and adequate funding and equipment. This study is an unquantifiable material on digital learning and policy options and prospects for quality education in Nigeria. Nevertheless, the paper's findings may not be consistent currently because of the changing nature and approach of e-learning today in Nigeria,

Similarly, Azubuike, Adegboye and Quadri (2021) focused on who gets to learn in a pandemic and exploring the digital divide in remote learning during the COVID-19 pandemic in Nigeria. The study investigated the digital divide in access to remote learning for children in Nigeria as a result of COVID-19. The study relied on survey research design via questionnaire administered - The analysis of the data revealed a relationship between the socio economic status and the digital divide in accessing remote learning. It equally established significant differences in students' access to remote learning opportunities during the pandemic, and significant differences in access to digital tool between students in government schools and their private school counterparts. The study equally showed a statistical significant association between parents' level of education and the ability to support children's remote learning ' during the pandemic. This study is apt because of its contribution of new evidence to the digital divide literature in the context-of COVID-19 or corona virus pandemic. However, the data for the study was not collected specifically to measure location (rural-urban divide) and socio economic status of the survey respondents.

Adeoye, Adanikin and Adanikin (2020), were concerned with COVID-19 and e-learning in the Nigeria tertiary education system. The study maintained that the emergence of COVID-19 pandemic has held global economy to ransom without sparing educational sector. The paper further posited that the pandemic has brought changes and disruptions to educational sector which has necessitated for e-education in order to cushion the effect of pandemic as most institutions are finding it difficult to adapt due to lack of infrastructures, paucity of funds and policy issues particularly in Nigeria. The paper, which examined the necessity of e-learning and its challenges and opportunities was qualitative in approach and made use of secondary sources of data. The study concluded that institutions are now entering e-learning which serves as an alternative to face-to-face contact learning thereby helping to cover gaps the pandemic might have caused in the academic calendar. The paper uncovered that the challenges of e-learning in Nigeria ranges from irregular power supply, high internet subscription cost and poor internet access. The study recommended among others effective government policies for the sustenance of social infrastructures and more funding for the tertiary institutions. This study is relevant for providing an insight on the Nigeria's tertiary

education system experience in e-learning during COVID-19. The study is loaded in it's literature but lacks empirical proof.

Kamal, Shaipullah, Truna, Sabri and Junaini (2020) were concerned with the transitioning to online learning during COVID-19 pandemic with emphasis on a pre-university centre in Malaysia. The paper argued that in the last decade, online learning has grown rapidly due to the outbreak of corona virus which has forced learning institutions to embrace online learning as a result of lockdown and campus closure. The study used survey methodological approach via administration of questionnaires. It's results proved that there is an increased positivity among the students in the area of teaching and learning in STEM during the pandemic. It was established that online, learning would not be a hindrance but blessing towards academic excellence in the face of calamity like COVID-19 pandemic. The study concluded that online learning would tremendously improve academic excellence. This study is beneficial to our research as it opens up an insight into the trends' on how colleges and universities reacted to the effects of the pandemic in their academic activities. On the other hand, only the students were considered in the survey without the inclusion of colleges and universities lecturers in Malaysia. This raises question on the generalization of the study.

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Coman, Tiru, Mesesan-Somitz, Stanciu and Bularia (2020), researched on the online teaching and learning in higher education during the corona virus pandemic with the purpose of identifying the way in which Romanian University managed to provide knowledge during the corona virus pandemic as well as to analyze student's perception regarding online learning, their capacity to stimulate information and the use of e-learning platforms. The study employed online survey based on a semi structured questionnaire through which data were collected from 762 students from' two of the largest Romanian Universities. The findings of the study proved that higher education institution in Romania were not-prepared for exclusively online learning. More so, the hierarchy of problems that arise in online learning changes in the context of the crisis caused by the pandemic. Also, technical issues are the most important, followed by teachers lack of technical skills and their teaching style improperly

adapted to the online environment. The paper recommended among others improved technical skills of the teachers and teaching style.

In another development, Obeidat, Obeidat and Al-Shalabi (2020) studied the effectiveness of adopting e-learning during COVID-19 at Hashemite University with the purpose of assessing students' perception of the effectiveness of the e-learning during COVID-19 pandemic at the Hashemite University, Jordan. The paper maintained that e-learning is the utilization of the electronic technologies and the media to deliver the educational content to the learners, enabling them to interact actively with the content, the teachers and their peers. In continuation, the study argued that students through e-learning have the advantage of accessing the educational content at any place and time saving them effort, time and cost. The paper relied on online survey which enabled the administration of questionnaire to a total of 399 students as the results established that student's overall evaluation of their e-learning experiences were related to technical issues. Also, uncovered by the study is that students of medicine are more welcoming of e-learning as it has contributed positively to their learning experience and learning outcome. This paper helps in demonstrating student's perceptions of the effectiveness of e-learning during COVID-19 pandemic. However, it fails to accommodate the opinion of other important stakeholders such-as the parents, trainers or teachers of e-learning.

Nwachukwu, Ugwu and Wogu (2021), looked at digital learning in post COVID-19 era. The paper argued that quality education is under threat since COVID-19 pandemic has disrupted the academic activities owing to its social distancing rule leading to the embracing of digital learning for the sustenance of academic activities. The paper adopted evaluative theory as a theoretical tool and utilized documentary research method using data from the 2018 economic intelligence unit. The analysis of secondary sources of data showed though meaningful efforts has been made by few of the private universities but the public universities are not good enough for full implementation of digital learning. The study suggested liberalization of the educational sector from the bureaucratic bottleneck that has bedeviled its transformational development and adequate funding and equipment. This study is an unquantifiable material on digital learning and policy options and prospects for quality education in Nigeria. Nevertheless, the paper's findings may not be consistent currently because of the changing nature and approach of e-learning today in Nigeria,

Mishra, Gupta and Shree (2020) researched on online teaching-learning in higher education during lockdown period of COVID-19 pandemic. The paper aimed at addressing the required essentials of online teaching-learning in education amid COVID-19 pandemic and how the existing resources of educational institutions can be effectively transformed into online education with the help of virtual classes and other pivotal online tools in this continually shifting educational landscape. The paper argued that the whole educational system collapsed during the lockdown period of the corona virus pandemic across the globe which made e-learning very imperative. The paper employed a combination of quantitative and qualitative approach to study the perceptions of stakeholders based on the online teaching learning process during the lockdown. The findings revealed that universities initiative for online



teaching - learning mode of instruction commenced through the instructions received from 'UGC and 'MHRD' under the government of 'India. Also, online teaching-learning tools like Zoom, Google Meet, Face Book and You-Tube streaming available for teachers and students were put to need-based use. The value of this paper to our study is that it draws a holistic picture of ongoing online teaching-learning activities during the lockdown period owing to COVID-19 outbreak. The study is limited to only one university, that is, Mizoram University hence its results may not be generalizable.

Elumalai, Sankart, Kalaichelvi, John, Monon, Alqahtani and Abumelha (2020) studied the factors affecting the quality of e-learning during the COVID-19 pandemic from the perspective of higher education students. The objective of the paper was to study the relationship of seven independent factors: administrative support course, content, course design, instructor characteristics, learner characteristics, social support and technical support on quality of e-learning in higher education during the COVID-19 pandemic. The paper posited that COVID-19 pandemic has redefined the educational system leading to the emergence of e-learning and teaching. The study utilized an inferential statistic across sectional study emphasizing in India and Saudi Arabia in which 784 samples were considered. The study adopted structural equation modelling approach to show the positive relationship between the quality of e-learning and the seven independent variables and two moderating variables in the higher education sector. The results revealed that there is a positive relationship between the set of variables and the quality of e-learning in the higher education sector during the COVID-19 pandemic. The study recommended among others concentration of higher educational institutions on the study outcomes related to administrative support, course content, course design, instructor characteristics, learner characteristics, social support and technological support to enhance equality of learning. This study would be of benefit to the top management and administrators of higher education institutions towards improving their actions in the quality of e-learning. Be it as it may, the study could not expose the quality of e-learning in higher education in the post COVID-19 pandemic.

In a study conducted by Reyes-Chua, Sibbaluca, Miranda, Palmerio, Moreno and Solon (2020) which aimed at finding out the status of the implementation of the selected higher education institution (HELs) in region IV-A in the conduct of the e-learning classrooms. The researchers argued that because of the COVID-19 crisis, higher educational institutions have resorted to online classes or e-learning classrooms to deliver the content of their curriculum in various platforms. The study was based on descriptive method of research and used an online survey data which followed documentary and descriptive analysis. The findings of the study showed the respondents had good experiences in introducing the e-learning classroom as an immediate response to the country's enhanced quarantine situation. Also, in the use of free e-learning platforms by students, they encountered problems of lack of resources, difficulty of Wi-Fi connection, and lack of training among the students and faculty members. The study recommended professional development, workshops for both faculty members and students and preparation of advanced lessons, slide presentations and examinations per unit to cope with the prescribed number of hours set by the commission on higher education. This study provides a theoretical foundation for studies on the level of implementation of e-learning in

Philippines. On the other hand, it has a small sample size of fifteen (15) which may not make for a more reliable valid and sustainable generalization.

Kaisara and Bivalya (2021), were involved in the study of the investigation of e-learning challenges faced by students during COVID-19 in Namibia with the aim of establishing student's experiences with the e-learning mode during the COVID-19 lockdown in Namibia and showed the results of an online survey of 137 undergraduate students about their experiences, using e-learning technologies during the COVID-19 induced university closures. The paper maintained that e-learning has become very popular in the last two decades and has been embraced across the globe as a tool to enhance accessibility' and affordability of higher education. Furthermore, the authors noted that e-learning became very popular and all-embracing in higher institutions during the COVID-19 lockdown period in order to circumvent lockdown and social distancing. The study created an online survey on Google forms and a link distributed to students through WhatsApp class groups. The data were analyzed with the use of frequency tables and figures, while thematic content analytical tool was employed in data analysis. The results of the study revealed that mobile device remained the primary computing device used to access academic information. Also, the results showed the emergence of five themes, namely. e-learning system accessibility, e-learning platform layout, resources to access internet and network. Isolation and home environment that captured student challenges with online classes. The study recommended effective mobile learning. The results of this study may not be generalizable but it provides a novel perspective as they report on perspectives of respondents who did not adopt e-learning volitionally nor opted for such a mode, but rather, were compelled by the circumstances around COVID-19. Besides that, the respondents in the study were all enrolled /or one programme and the majority of them were first year students, it may be possible that some students had yet to be fully socialized into the university systems, thus magnifying the perceived ill functionalities of the e-learning system.

Sanad (2020), focused on the perceptions towards e-learning in times of COVID-19 lockdown phase in the tertiary education. The paper was aimed at exploring the perceptions of students and teachers on the use of e-learning during the<sup>1</sup> COVID-19 lockdown phase. The paper maintained that COVID-19 pandemic<sup>1</sup> had ravaging effects on the whole lifestyles of the people globally since its first spread in China in 2019. Among the sectors that were affected were educational sector and its effect led to the emergence and widespread acceptance and encouragement of e-learning. The paper used survey method as the participants represented in the samples were students from various Egyptian private and government universities who depended on e-learning in completing courses and evaluating students. The findings of the study uncovered that general agreement among teachers and students on using e-learning during and after the lockdown phase, ' despite some challenges and difficulties encountered. This study is of immense value for providing perceptions about e-learning during the COVID-19 pandemic in the educational system. That notwithstanding, the study is not in-depth in its analysis.

Obododike and Okekeokosisi (2020), examined the challenges of implementing e-learning in Nigeria educational system in the COVID-19 pandemic. The paper posited that COVID-19 affected the world in many ways. It held economy at ransom without the exemption of educational sector. This has brought about recent changes and disruption in educational sector which necessitated a shift towards e-learning in order to cushion the effect of the 'pandemic. The paper argued that the shift to e-learning in the institutions has been fraught with difficulties of unpreparedness of the institution, lack of infrastructures, paucity of funds and policies issues in the Nigeria education sector. The study was descriptive in its methodology and analysis of data. It concluded that the present world pandemic is making the educational sector to look inward as institutions have resorted to e-learning instead of face to face contact learning thereby helping to cover the gap observed by the institution arising from the effects of COVID-19 pandemic. The paper recommended among others government proactiveness in ameliorating the challenges identified in the study and build on the opportunities e-learning offers educational institutions. It also called for provision of stable internet provider for easy and fast learning and teaching, basic knowledge of computer, stable electricity and strong policy framework for effective and efficient learning in the schools. This paper presented in a lucid language the major challenges underlining the implementation of e-learning in Nigeria educational system in time of COVID-19 pandemic. This will add to the existing literature on the related themes of the study. Despite that, the study could not adequately give account of the contributions of scholars on the topic of the study for the enrichment of the literature.

Hoq (2020), focused on e-learning during the period of pandemic (COVID-19) in the United states of Saudi Arabia. The paper argued that e-learning is information technology supported by virtual education system. It has emerged as a dominant channel of learning and its value in education has led to substantial development online. The study used survey method of research Data were collected through the help of (20) questionnaire. The paper concluded that it is crucial to incorporate e-learning in education system 'as it' will ensure a more of the responsibility of teachers from dispenser of learning materials to catalyst of students. Established by the study is also that teachers are very positive about e-learning. The paper recommended formal training for the teachers and students who do not have knowledge and skills of technology, appropriate coordination among the major stakeholders, and revision of the course syllables in line with e-learning package, motivation and reward of instructors, among others. This study is another resourceful material to existing literature on e-learning during the period of COVID-19 outbreak in the globe. However, the study only involved male teachers and only one educational institution which may bring skepticism on the generalization of the results.

Okereke, Williams, Nzeribe, Ashinedu and Maira (2020), looked at COVID-19 challenges affecting the uptake of e-learning in pharmacy education in Africa. The paper argued that the effort by the countries and relevant stakeholders across the globe to improve the quality of pharmacy education was being undermined by the outbreak of COVID-19 pandemic. And to curtail the spread of corona virus, quick measures such as lockdown, social distancing has whittled down academic activities particularly the delivery of pharmacy education. In order

to overcome this challenge, e-learning has been introduced and encouraged. This paper is qualitative in methodology and descriptive in analysis. It concluded that the support for pharmacy education calls for strengthening of learners' engagement and satisfaction in the e-learning process. Also, government should devise means to contain the challenges that hinder feasibility, acceptability and uptake of the e-learning strategy. The study is valuable because it will help to strengthen learner's engagement and satisfaction in Pharmacy education in the face of the COVID-19 pandemic. On the other hand, the study is too limited and lacks empirical literature.

Ntshwarang, Malinga and Losike-Sedimo (2021), focused on e-learning tools at the University of Botswana in view of the COVID-19 crisis. The paper posited that information technology is presently a highly sought component of every higher learning institutions 'towards e-learning mode of instruction and knowledge acquisition. Furthermore, the author maintained that e-learning encompass multiple technology and internet based learning platforms that requires computer literacy from both learner and instructors as it offers more flexibility and comfort as instruction and learning occurs at any time and at the user's preferred environment. The article was a qualitative method based on the information from the literature review, author's experience and observations. The paper observed from its findings that poor infrastructural development and poor access to internet by the higher tertiary students, poor preparation of staff and poor attitude towards e-learning are the difficulties that e-learning faces in Botswana. The paper call for government intervention and partnership with the core stakeholders to put measures in place that will take care of the challenges of e-learning in the tertiary institutions. This article is a resourceful material because of its ability in providing the background, types, relevance, use, advantages and the challenges associated with e-learning under COVID-19 crisis.

In assessing the adoption of e-learning and m-learning during COVID-19 lockdown in Nigeria, Yekini, Adigun, Ojo and Akinwale (2020) argued that the effects of COVID-19 such as the lockdown and social distancing left people with the option of communicating through telephone, computer and other information communication, technology, devices. This situation forced the school system to embrace e-learning. 'This paper explores the challenges militating against using e-learning and m-learning during Covi-19 by students and teachers through mobile phone, text messages, voice call WhatsApp etc. The paper made use of survey research design and administered questionnaire to a sample of 272 that comprised both teachers and students. Percentage statistics was used in the analysis of data as the findings indicated that the majority of the teachers and students have limited access and connection to internet, student living in the urban areas enjoy better internet connection, there is lack of power supply and customised e-learning package, and students and teachers are not adequately trained on the use-of e-learning. The paper recommended training off awareness, knowledge and interaction with e-learning and m-learning resources, adequate provision of facilities like e-content, e-library, dedicated e-learning and m-learning portal, study-power supply, review of ICT policy to favour teachers and students etc. This study's results inspire teachers and learners to explore e-learning and m-learning in schools. Besides that, it is not anchored on any case study.

Nguyen, Enos, Vandergriff, Vasquez, Cruz, Jacob and Mauskar (2020), looked at the opportunities for education during the COVID-19 pandemic. The paper, which aimed at showing the opportunities for education during the outbreak of COVID-19 pandemic maintained that the rapid spread of corona virus disease 2019 (COVID-19) has redefined all aspects of lives especially in the education sector where lockdown and social distancing has facilitated e-learning to avoid further spread of the virus. The paper concluded that the challenges presented by COVID-19 have highlighted a collective resilience and creativity. This is another resourceful material to the existing literature on the prospects of e-learning in the COVID-19 era. This paper notwithstanding its usefulness lacks robust literature and could only be classified as a mere commentary.

### **Opportunities of E-Learning During COVID-19**

A good number of opportunities exist with the introduction of e-learning. Among them are:

- i. Education without Barrier:** E-learning provides educational opportunities for everyone with little or no barrier, especially those who were deprived of the opportunity of attaining education for political, social, economic and geographical reasons. In other words, it relatively gives equal education opportunity to all (Obeidat, Obeidat and Al-Shalabi, 2020) in comparison with the traditional classroom teaching method.
- ii. Cost Effective:** E-learning is cost effective as it reduces travel-time and infrastructural development. Hence, the cost benefit of e-learning in training students is lesser than the physical or face to face contact (Arkorful and Abaidoo, 2014). By reducing the time taken away from the office, removing travel cost online learning helps to save money and increase workspace productivity. It makes learning simpler, easier and more effective (Ajali, Salawu and Adeoye, 2008).
- iii. Efficiency and Effectiveness:** E-learning improves teaching efficiency and effectiveness. It promotes personnel knowledge and skills and enhances learning by exploring new technologies and their application (Nwachukwu, Ugwu and Wogu, 2021). This implies that e-learning engenders efficiency in knowledge as both the lecturers and learners will have easy access to a large amount of information within the global village. It enhances ability to learn and implement new processes and knowledge as well as helps to retain information for a longer time.
- iv. Convenience:** E-Learning provides convenience in learning. It reduces the use of insufficient classrooms for lecturers as the students can easily take their online lecturer whenever they wish without disruption at their convenience. The use of computers via e-learning gives a high sense of comfort and privacy than the traditional face to face classroom (Adeoye, Adanikin and Adanikin, 2020, Hoq, 2020) Not everybody feels comfortable learning in a large group, but e-learning allows everyone to tackle the subject at their own pace, with interactive tasks ensuring a thorough understanding throughout each module (Ajali, Salawu and Adeoye, 2008). The internet which is the device of e-learning provides students with the opportunity to make choices about the type of direction of their learning and gain feedback quickly and efficiently. Through e-learning, students will be provided studies round the clock (7 days a week and 24 hours a day) which further attracts working class, students and individual's greater

interaction: E-learning makes a way for greater participation without physical participation and relationship between lecturers and students which decreases stress (Adeoye, Adanikin and Adanikin, 2020). It stimulates collaboration and connectivity between lecturers and students as well as encourages teamwork and improved personal contacts (Swanson, Davis, Parks, Atkinson, Forde, & Choi, 2015).

### **Challenges of E-Learning in COVID-19 Era**

The use of sustenance of e-learning since the outbreak of corona virus in 2019 in Nigeria has continued to face certain challenges. Among them include.

- i. **Inadequate Funding:** Unlike countries in Europe (France, London) and Asia (China, North Korea), e-learning in Nigeria was not receiving adequate funding required to put the necessary facilities and equipment's that will make for ease of e-learning in Nigeria (Oye, Salleh and Iahad, 2011 cited in Nwachukwu, Ugwu and Wogu, 2021). Poor budgetary allocation and lack of financial support from government have made it difficult for educational institutions to sustain e-learning in Nigeria (Adeoye, Adanikin and Adanikin, 2020). As a result, tertiary institutions have not taken significant advantage of the opportunities provided by the information communication technology (ICT) age. In this cause, therefore, financial restrictions and parity of funds impedes digital learning and progress in the tertiary institutions especially in the acquisition necessary technological tools and systems for e-learning (Amphina, 2020) and maintenance of system and technical support.
- ii. **Epileptic Power Supply:** Unstable power supply constitutes a serious challenged e-learning in Nigeria's tertiary institutions. Epileptic power supply is a major setback on ICT development and advancement. This makes it extremely difficult for students in the tertiary institutions to experience significant progress in the e-learning platform and in powering educational gadget like laptops, desktops computers needed for e-learning (Adeoye, Adanikin and Adanikin, 2020). Similarly, Ajadi (2008) Obododike and Okekeosisi (2020) averred that erratic power supply in Nigeria does not stimulate e-learning and technological breakthrough. Nations who have attained ICT advancement are those with stable and sustainable electricity supply. Accordingly, Nwana (2020) writes that the perennial problem in Nigeria is the problem of electricity instability which has been a major setback for her technological development. Some of the tertiary institutions that are found in cities and towns are faced with the problem of epileptic supply of electricity while majority of them who are in rural areas are hardly connected to the national grid. The point from the above shows that lack of power supply undermines information communication technology development as can be seen in the poor e-learning services in the tertiary institutions in Nigeria.
- iii. **High Cost of Information Communication Technology Facilities:** ICT facilities is relatively high in price. For example, internet service which boost e-learning platforms requires a lot of data. The cost of purchasing data is usually high as many users (Lecturers and students) cannot easily afford it. In like manner, Obododike and Okekeokosisi (2020) and Hoq (2020) note that the cost of computer and accessing internet is still high and beyond the reach of most lecturers and students. In other words, the subscription to internet and cost of computer are very expensive to buy,

maintain and update which undermines e-learning in the tertiary institutions. Also, the high cost of the software put off some students who showed interest. As a corollary to the above, in most tertiary institutions in Nigeria as Lukeman (2020) posits, there is lack of full coverage internet service. Only 10% of total institutions in Nigeria have Wi-Fi. IGB hardly serves 250mb purpose and therefore, it is difficult for students to survive the cost needed to stay on line for the virtual learning.

- iv. **Low Expertise of Lecturers:** Arguably, low expertise among some lecturers to assist learners or students develop the skills and training in e-learning platforms effectively and efficiently has remained a bottleneck. Lack of adequate training of lecturers to manage available systems for e-learning is worrisome. Thus most tertiary institution like National Open University of Nigeria have few technical staff to maintain the current system (Ajabi, Salawu and Adeoye, 2008). This implies that low computer literacy level, lack of basic knowledge on computer and internet related tools as well as limited expertise are contributory factors that undermine e-learning development in Nigeria's tertiary institution (Aduke, 2008; Oye, Salleh and Iahad, 2011). These factors may be responsible for the lack of interest in e-learning by stakeholders and uneasiness of learners with electronic gadgets.
- v. **Inadequate Knowledge of E-learning by the Students:** Nwachukwu, Ugwu and Wogu (2020) observe that most tertiary institutions in Nigeria especially government owned are not adequately equipped for e-learning in post COVID-19 era. This is probably because the emergence of e-learning owing to COVID-19 pandemic effect like social distancing came out unexpectedly when tertiary institutions had no strong arrangement for e-learning in place. A good number of the students admitted in the tertiary institutions have no computer education background, hence they are reluctant in operating one. The very few who have access to the computer do not know how to use it and maximize its usage (Gillete-Swan, 2017). There are various technological components including multimedia equipment, laptops, smart phones and internet connection readily available for roll-out. How many students can use these devices that will aid in the e-learning process? Again, collaboration tools on the platform such as video conferencing, audit chat, interactive games and messaging should be tested and ready to enable interaction between lecturers and students. But this is always a challenge especially in Nigeria where some students and lecturers cannot really interface between the various e-learning tools (Dhir, Verona, Balta & Mishra, 2017 cited in Hoq, 2020).

### **Concluding Remarks**

COVID-19 pandemic has redefined the learning process in the educational industry. The effort to contain the its spread of occasioned, lockdown and social distancing measures which discourages face-to-face learning thereby making the adoption of e-learning very imperative. However, e-learning in the time of COVID-19 has the capacity of promoting greater efficiency and effectiveness in learning, reducing the cost of education as well as providing educational opportunities to all with little or no barrier. Despite the struggle to intensify and consolidate e-learning in Nigerian tertiary institutions, inadequate funding, epileptic power supply, high cost of information, communication technology equipment's, low expertise of lecturers and inadequate knowledge of e-learning by the students constitute challenging factors.

To ensure the sustainability of improved e-learning in Nigerian tertiary institutions, the following should be taken into consideration:

1. Adequate funding of e-learning in the Nigerian tertiary institutions is recommended. In this wise, government should as a matter of necessity budget adequate resources for the funding of information communication technology in the tertiary institutions in both private and public schools for ease of e-learning.
2. There is an overriding need for government to partner with the private sector in investing on electricity in order to boost power supply in Nigeria especially in the tertiary institutions.
3. Government should sustain a policy that will regulate the charges of ICT providers and data services as well as strengthen their coverage across Nigeria for ease availability of call and data service.
4. Priority should be given to regular training and retraining of lecturers by their institutions on the use and application of information communication technology and internet connectivity.

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