

**DIGITAL LEARNING DEVICES UTILIZATION AND LEARNING
EFFECTIVENESS AMIDST COVID-19 PANDEMIC IN UNIVERSITIES IN
KWARA STATE, NIGERIA**

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Abstract

The disruption in the academic calendar of universities in Nigeria as a result of the COVID-19 pandemic has made many universities to shut their doors in compliance with the directives of the Federal Government as a way of containing the spread of the virus among the academic, non-academic staff and students. With the closure of schools, many private universities in Nigeria resorted to the use of digital learning devices as a way of ensuring that teaching and learning activities are unhindered amidst the COVID-19 pandemic. The study adopted descriptive design of explorative type. The study population are the 8566 undergraduate students of the four private universities in Kwara

State. Random sampling technique was adopted to select the 860 participants that took part in the survey. Two validated researcher-design questionnaires tagged "DLDQ" and "LEQ" were used for data collection. Major findings revealed that a positive significant relationship exist between digital learning application and learning effectiveness in private universities in Kwara State ($r = 0.409$; $p < .000$). The study recommended that university students should be encouraged by the school authorities at the point of admission and registration to get digital learning devices such as laptops or tablets for effective and meaningful learning activities to take place.

Keywords: Digital Learning Devices, Learning Application Devices, Learning Effectiveness, COVID-19, Private Universities

Introduction

The outbreak of Corona virus also known as COVID -19 which emerged in China from a town called Wuhan city was later declared a disruptive virus to human beings by the World Health Organization (WHO, 2020). According to European Lung Foundation (2020) corona virus is a large family of viruses that cause illness ranging from the common cold to more serious diseases such as Severe Acute Respiratory Syndrome (see <https://www.europeanlung.org/en/en/covid-19/what-is-covid-19>). According to WHO (2020), COVID -19 virus is primarily transmitted by coughing and sneezing, especially when someone in close proximity breathes in the resulting droplets. According to UNESCO (2020) report, governments around the world have declared a temporal closure of educational institutions with a view of reducing the spread of the COVID -19 pandemic. The month of March 2020 will be remembered in the entire world as a remarkable month because schools in the world shut their doors as a result of the emergence of the Corona Virus. The Corona virus has affected the world economy of which the education sector all over the world is not spared by this pandemic. Winthrop (2020) observed that by the end of the month of March, 185 countries had closed the doors of their schools at the primary, secondary and higher institutions, and this affected 90 percent of the world's students. In a bid to curtail the spread the Federal Government of Nigeria ordered the closure of the Nations education institutions from the primary to the tertiary level.

The pandemic created a crisis situation in the educational sector and the only remedy that can assist in combating this crisis is technology. Technology provides solutions at times of crisis to combat disruption and helps people to communicate and even work virtually without the need for face-to-face interaction. The rate at which change is taken place in all human endeavours as a result of the advancement in technology cannot be undermined (Ojo, 2015). No wonder that Mark and Semaan (2008) advised that due to the changes taken place in human endeavours, organizations as well as educational institutions should adopt new technology for interacting and working. The application of information and communication technology (ICT) in teaching and learning means the use of digital equipment in all areas of teaching and learning activities in the school.

Digital learning devices is synonymous with mobile learning devices and electronic learning devices but all these terms come under the umbrella term of Information and Communication Technology. In this study, the three terms will be used interchangeably to mean the same thing. This is because many previous researchers who had carried out studies in this area used the term to mean the same thing. The application of digital learning covers vast spheres or areas of human endeavours. Due to differences in opinions, views and perceptions there are varieties of definitions. The most acceptable one is the definition proposed by American Society of Training and Education (ASTD) that e-learning is the process in which learners apply digital media to learning. This comprises of the internet, corporate network, computers, satellite broadcasting, audiotapes, videotapes, interactive TV, and compact disks. The application includes network-based learning, computer-based learning, virtual classrooms, and digital cooperation. Anttila, Valimaki, Hatonen, Luukkaala and Kaila (2012) regarded digital learning as a digital tool to acquire digital teaching materials for online or offline learning activity through wire or wireless networks (Hockly, 2012).

Thus, digital devices are used in all aspects of our lives, and in all different workplaces. The introduction of digital learning devices in education in the 21st century has brought about tremendous opportunities for learning. With advancement in technology in the information age, the use of digital devices is a force to be reckoned with in modern education systems. Digital learning devices have had

major impacts on the way we learn, both inside and outside of the classroom. It is in this vein that Perienen (2020) argued that with the coming of technology impacting almost all areas of life, the education sector too is witnessing a paradigm shift. According to the Alliance for Excellent Education, digital learning is any instructional practice that effectively uses technology to strengthen a student's learning experience. Mobile learning is the delivery of educational materials and learning contents through mobile technologies such as mobile phones, smartphones, PDAs, MP3/MP4 players, e-book readers (e.g. Kindle), netbooks, tablets (e.g. iPad, Galaxy Tab), hybrid tablet/smartphone gadgets (Sitthiworachart and Joy, 2008). Digital technologies are positioned as mediating tools to facilitate change in schools, improving standards and facilitating personalized learning (Fullan, 2013; Hammond, 2013). Similarly, digital learning according to Dobrovolny, Edwards, Friend and Harrington (2015) is broadly described as a range of educational opportunities made possible by digital technologies.

It is worthy of note that the decision of the Federal Government of Nigeria to allow private universities to operate alongside their public counterparts was borne out of the need to align practice with other parts of the world. Private universities in the word of Belfied and Lerin (2003) are non-public or independent universities as such not receive any support from the government in the areas of funding and administration. The emergence of private universities in Nigeria dates back to the era of President Shehu Shagari administration between 1979 and 1983 but due to the coup-de-tat by the military at that period, the 26 established private universities were ordered to close down. But during the era of President Olusegun Obasanjo between 1999 and 2003, the establishment of private universities was revisited by the National Universities Commission (NUC) the highest regulatory body of university education in Nigeria. The NUC made recommendations to the Federal Government for the establishment of private universities in the country. It should be noted that out of the 40 applications received in 1999 only three met the NUC requirements and the three were granted license; they are Igbinedion University, Okada, Edo State, Babcock University, Ilisan Remo, Ogun State, and Madonna University, Okija, Anambra State. According to the information obtained from <https://www.nuc.edu.ng/> the number of private universities has risen from three to 79 in the year 2019.

University is recognized as an ivory tower of education by many scholars and researchers. A typical university is comprised by three major actors, the administrators, the academic staff and non-teaching staff and the students (Ojo, 2020). Universities, like any other social institution, have had to face devastating epidemics such as Ebola, Hepatitis, cultism that has impacted their daily functioning. And they have survived and continued their mission even with their doors closed. The COVID-19 pandemic has affected university education in Nigeria thereby making it difficult for the goals and objectives of the universities to be achieved. With the introduction of digital technologies, the need to integrate digital devices in learning is inevitable and unavoidable in private universities in Nigeria during the time of the coronavirus pandemic. However, researchers have revealed that the usage of the internet in teaching and learning in higher institutions have improved educational development and research and thus encouraged virtual interactions in dissemination of research findings (Apuke and Iyendo, 2017; Hussain, 2012; Iyendo and Halil, 2015). In addition, it provides access to education through distance and open learning systems (Kabir and Kagade, 2017).

In a study on the utilisation of e-learning facilities in the educational delivery system of Nigeria by Eze, Chinedu-Eze and Bello (2018), their findings show that there are quite a number of e-learning facilities available in most private Universities compared to public universities, the usage of e-learning facilities in private universities is still on the average. This is as a result of lack of technical know-how and the attitudes of the staff which reveal the low level of usage of ICT equipment and facilities in schools today (Apuke and Iyendo, 2017; Pandey and Tiwari, 2014). A study was conducted on the impact of mobile devices for learning in higher education institutions in Nigeria by Shonola, Joy, Oyelere and Suhonen (2016). It was discovered from their study that portable devices were used by students to exchange education-related messages, academic materials and discussions among themselves.

The research findings of the study of Ghavifekr and Rosdy (2015) showed that the integration of ICT has a great effectiveness for both teachers and the students. Also, Mugo, Njagi and Chemwei (2017) in their study on student technological preferences, their levels of utilization as well as attitudes toward mobile technologies found that

the use of smartphone was popular among students but its usage for teaching and learning purposes were very low. However, the research of Pandey and Tiwari (2014) reveal the poor performance of Nigerian institutions in ranking due to the poor state of ICT, unimpressive attitude of government in financing ICT projects and unstable power supply which hinders internet operations and access as well as sound teaching and research. In a similar study, Apuke and Iyendo (2018) report that students in their study perceived that the lack of digital readiness among staff and their institution as well as the absence of electronic library for easy accessibility to journals from the scientific databases is a major problem harnessing ICT in schools. In addition, Shonola and Joy (2014) study on the barriers to m-learning in higher education institutions in Nigeria reveals that the m-learning barriers in Nigeria include regulatory issues, school curricula, inadequate funding, lack of infrastructure, over-dependence on mobile technology, attitude and fear, as well as political issues.

Statement of the Problem

The problem created by the outbreak of COVID-19 virus in the Nigerian university system is enormous and has led to the new “normal” in teaching and learning as well as emergence use of ICTs. It has brought about abrupt disruption to the academic calendar of all universities in the country. In order to ensure that academic activities continue, many private universities in the country and in Kwara State in particular have resorted to the use of digital learning devices to foster teaching and learning amidst the closure of schools. There is ineffectiveness as a result of lack of adequate digital learning devices, network issues, technical challenges of most of the learning application platforms, high cost of connectivity to the internet, inadequate training of the personnel involved in the teaching and learning process via the use of digital devices are some of the problem that led the researchers to conduct this study. The extent to which these digital learning devices have been able to bring about learning effectiveness in private universities in Kwara State is the focus of this research.

Research Questions

- (i) What are the digital learning devices available amidst the COVID-19 Pandemic?

- (ii) What are the digital learning applications utilized amidst the COVID-19 Pandemic?
- (iii) What is the level of digital learning devices utilization amidst the COVID-19 Pandemic?
- (iv) What is the level of learning effectiveness amidst the COVID-19 Pandemic?

Research Hypotheses

Ho1: There is no significant relationship between digital learning applications utilization and learning effectiveness amidst the COVID-19 Pandemic in Private Universities in Kwara State, Nigeria.

Ho2: There is no significant relationship between digital learning devices utilization and learning effectiveness amidst the COVID-19 Pandemic in Private Universities in Kwara State, Nigeria.

Methodology

The study adopted descriptive survey research design because it sought to establish whether there is a relationship between the variables of the study in a method that would allow the respondents to give their views on items of the questionnaire and give their opinions to provide tangible solutions to the research problems. There are four private universities in Kwara State, Nigeria and are distributed across the three senatorial districts of the State, that is, Kwara Central, Kwara South and Kwara North. Kwara Central and Kwara South have two private universities each while Kwara North has none. The population of undergraduate students is 8,566 while the target population was 6,684. Thereafter, purposive sampling technique was used to select one university each from the two senatorial districts which has universities domiciled in their area. As a result, one private university was selected from Kwara Central senatorial district of the State, while one was also selected in Kwara South senatorial district of the State. The choice of these two private universities was because of their years of establishment. The number of universities used for this study is two. However, simple random sampling technique was adopted to select 860 respondents out of the undergraduate students from all the faculties.

The instrument used for data collection was carefully and diligently developed by the researchers on a four-point Likert scale. This was done to get the opinions of the respondents by ticking the best option that aligns with their view even though the instruments used by other researchers served as a guide. The items in the questionnaire were developed by the researchers. The questionnaires were tagged Digital Learning Devices Questionnaire (DLDQ) and Learning Effectiveness Questionnaire (LEQ). The survey items went through a series of validation stages: all the authors made inputs on the items, experts in Educational Management and Tests and Measurement Departments were contacted to ascertain the face, construct and content validities of the items in the questionnaire and the suggestions and corrections made by the experts were incorporated into the final draft before it was finally administered on the respondents. Google form was developed for the items and the link was sent to the respondents of the study for their honest responses since the study was carried out when the universities were still closed down. It is important to mention that the researchers respected the responses of the respondents and ensured that they were treated with the most confidentiality. In the course of administering the instruments, respondents were not forced or enticed by financial gains or predetermined results to engage in the activities. This research work is independent and impartial in every aspect and the respondents were not forced to participate in the study.

Results

Research Question 1: What are the digital learning devices available amidst the COVID-19 Pandemic in Private Universities in Kwara State, Nigeria?

Table 1: Digital learning devices available amidst the COVID -19 pandemic in private universities in Kwara

S/N	Learning Devices	Available		Not Available	
1	Desktop	240	27.9 %	620	72.1%
2	Laptop	650	75.6%	210	24.4%
3	Tablets/I-pad	280	32.6%	580	67.4%
4	Smart/Android Phones	700	81.4%	160	18.6%

Source: Researchers' outcome (2020)

It is evident from table 1 that smart/android phones were the most available learning devices with 700 (81.4%) of the respondents ticked available while 160 (18.6%) ticked not available while the least available learning devices was desktop with 620 (72.1%) of the respondents were of the view that desktop was not available.

Research Question 2: What was the digital learning applications utilized amidst the Covid-19 Pandemic in Private Universities in Kwara State, Nigeria?

Table 2: Digital learning applications utilized amidst the COVID-19 pandemic in private universities

S/N	Learning Applications	Utilized		Not Utilized	
1	Zoom App	540	62.8%	320	37.2%
2	WhatsApp	530	61.6%	330	38.4%
3	Telegram App	810	94.2%	50	5.8%
4	Instagram App	280	32.6%	580	67.4%
5	Google Classroom App	170	19.8%	690	80.2%
6	Edmodo App	60	7.0%	800	93.0%
7	Connectal App	60	7.0%	800	93.0%
8	YouTube App	380	44.2%	480	55.8%

Source: Researchers' outcome (2020)

As shown in table 2, the mostly utilized learning application amidst COVID-19 was Telegram App with 810 (94.2%) ticking utilized while 50 (5.8%) ticked not utilized. Edmodo App and Connectal App were the least with 60 (7.0%) of the respondents utilized them respectively while 800 (93.0%) ticked not utilized for both Edmodo App and Connectal App.

Research Question 3: What is the level of digital learning Applications utilization amidst the Covid-19 Pandemic in Private Universities in Kwara State, Nigeria?

Table 3: Level of Digital Learning Application Utilization amidst the Covid-19 Pandemic in Private Universities

Levels	Frequency	Percent
Low	350	40.7
Moderate	440	51.2
High	70	8.1
Total	860	100.0

Source: Researchers' outcome (2020)

Table 3 shows that the level of digital learning applications utilization amidst the COVID-19 Pandemic in the selected private universities in Kwara State, based on the respondent responses is moderate. The range was determined by aggregating the 8 items and multiplied by 4 (response scale) equaled to 32. The maximum minus minimum (32-8) equaled to 24 divided by 3. Therefore, the data was recorded to $8-16 = 1$, $17-24 = 2$, and $25-32 = 3$. Hence, the frequency and percentage were used to determine the level. It means that digital learning devices utilization amidst COVID-19 Pandemic level is moderate since 51.2% of their rating is within the range of 17-24 on the aggregate.

Research Question 4: What is the level of learning effectiveness amidst the Covid-19 Pandemic in Private Universities in Kwara State, Nigeria?

Table 4: Level of learning effectiveness amidst the Covid-19 Pandemic in Private Universities

Levels	Frequency	Percent
Low	50	5.8
Moderate	280	32.6
High	530	61.6
Total	860	100.0

Source: Researchers' outcome (2020)

Table 4 indicates that the level of learning effectiveness amidst the COVID-19 Pandemic in the selected private universities in Kwara State, based on the respondent responses is high. The range was established by aggregating the 10 items and multiplied by 4 (response scale) equaled to 40. The maximum minus minimum (40-10) equaled to 30 divided by 3. Therefore, the data was recorded to $10-20 = 1$, $21-30 = 2$,

and 31-40 = 3. Hence, the frequency and percentage were used to determine the level. It implies that I learning effectiveness amidst COVID-19 Pandemic level is high since 61.1% of their rating is within the range of 31-40 on the aggregate.

Research Hypotheses

HO₁: There is no significant relationship between digital learning applications utilization and learning effectiveness amidst the Covid-19 Pandemic in Private Universities in Kwara State, Nigeria

Table 5: Digital Learning Applications Utilization and Learning Effectiveness amidst COVID- 19 Pandemic in Private Universities

Variables	1	2
Learning Effectiveness	1	.409**
Learning App Utilization		1

Source: Researchers’ outcome (2020)

** . Correlation is significant at the 0.01 level (2-tailed).

The association between digital learning applications and learning effectiveness was examined using Pearson product-moment correlation coefficient. Preliminary analyses were carried out to ensure no violation of the assumptions of normality, linearity and homoscedasticity. The result revealed a positive significant relationship existed between the two variables, $r = 0.409$, $n = 860$, $p < .000$ as shown in the table 5.

HO₂: There is no significant relationship between digital learning devices utilization and learning effectiveness amidst Covid-19 Pandemic in Private Universities in Kwara State, Nigeria

Table 6: Digital Learning devices Utilization and Learning Effectiveness amidst COVID-19 Pandemic in Private Universities

Variables	1	2
Learning Effectiveness	1	.202
Learning App Utilization		1

Source: Researchers’ outcome (2020)

** . Correlation is significant at the 0.01 level (2-tailed).

The association between digital learning devices utilized and learning effectiveness was established using Pearson product-moment correlation coefficient. Preliminary analyses were carried out to ensure no violation of the assumptions of normality, linearity and homoscedasticity. The result showed a positive yet not significant association existed between the two variables, $r = 0.202$, $n = 860$, $p < .001$ as shown in the table 6. By implication, digital devices used during the lockdown do not enhance effective learning significantly among private universities students.

Discussion of Findings

The result from data analysis on the digital learning devices available amidst the COVID-19 pandemic in private universities in Kwara State shows that smart/android phones were the most available digital learning devices among private university students, while desktop was the least available digital learning devices. The reason for the finding may be because of the ease of use, portability and the cost of acquiring smart/android phones when compared with the other digital learning devices. The findings of the study agreed with that of Mugo, Njagi and Chemwei (2017) who found that the use of smartphone was popular among students, but its usage for teaching and learning purposes were very low.

The result from table 2 on the digital learning applications utilized amidst the COVID-19 pandemic in private universities revealed that Telegram App was the mostly utilized App by the respondents, while Edmodo and Connectal Apps were the least used digital learning applications by the respondents. The finding of the study may be as a result of the fact that the respondents perceived Telegram App to be easier to use, and that cost of data is reduced when compared with the other learning applications. The finding of the study was in consonance with that of Adeoye, Adanikin and Adanikin (2020) whose study revealed that some private universities in Nigeria have adopted several e-learning platforms such as Zoom, Microsoft teams, google hangout (meet), skype, Bamboo learning, google classroom, Docebo, WIZIQ, Adobe captivate, Elucidat, Blackboard learn to foster learning during this pandemic.

The analysis on table 3 revealed that level of digital learning application utilization amidst the COVID-19 Pandemic in private

universities was moderate. This shows that the utilization of digital learning application was moderate among the respondents. The finding of the study corroborates that of Eze, Chinedu-Eze and Bello (2018) whose findings revealed that the usage of e-learning facilities in private universities is still on the average.

The result presented on table 4 on the level of learning effectiveness amidst COVID-19 Pandemic in private universities in Kwara State, based on the respondent responses is high. The finding on table 4 may be due to the wide range of opportunities that it has brought to learning. The finding of the present study supports that of Ghavifekr and Rosdy (2015) which showed that the integration of ICT has a great effectiveness for both teachers and the students. The finding of the study also agreed with the previous findings of Mugo, Njagi and Chemwei (2017) whose study revealed that students' technological preferences, their levels of utilization as well as attitudes is the main reason for the effectiveness.

The result of table 5 revealed that digital learning applications utilized during the COVID-19 pandemic by students promotes learning effectiveness significantly among the private universities in Kwara State. The finding of the study was in consonance with earlier findings by Shonola, Joy, Oyelere and Suhonen (2016), Adeoye, Adanikin and Adanikin (2020) whose studies found that various digital learning applications were used by students to exchange education-related messages, academic materials and discussions which promotes learning effectiveness among them.

The result on table 6 revealed that digital learning devices used during COVID-19 pandemic do not enhance effective learning significantly among private universities students. The reason for this finding may be due to the cost associated with getting some of these digital learning devices.

Conclusion

The emergence of COVID-19 pandemic all over the world has brought disruption to the academic calendar of all educational institutions at all levels. This disruption was as a result of closure of all institutions by the government around the world with a view of curtailing the spread of the deadly COVID-19. In a bid to ensure that academic activities continue even when educational institutions were closed, lots of

private universities around the world have resorted to the use of digital learning devices. The private universities in Kwara State have also introduced it with a view of ensuring that academic activities are not totally paralyzed. Based on the result obtained from the study, it was concluded that smart/android phones were the most available digital learning devices among private universities students, Telegram App was the mostly utilized App by the students, the level of digital learning application utilization was moderate and the level of learning effectiveness amidst the COVID-19 Pandemic in private universities in Kwara State was high.

Recommendations

In line with the findings of this study, the following recommendations were made:

- i. Private university students should be encouraged by the school authorities at the point of admission and registration to get digital learning devices such as laptops or tablets for effective and meaningful learning to take place.
- ii. The students should be accustomed to other digital learning applications for learning effectiveness to be achieved.
- iii. The authorities of private universities as a matter of urgency should improve the internet connectivity on their campus so that lecturers would be able to make better use of the digital learning devices available for learning to be more effective.

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