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# Teachers' Perception of the Adoption of Digital Technologies for E-learning during Covid-19 Pandemic in Nigeria

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## Abstract

Covid-19 took the world by surprise, resetting world events for most of 2020. The educational system was negatively affected as students were forced to remain at home for several months without receiving teacher instructions. To engage the students remotely, most schools adopted e-learning to facilitate instructions so that the students would not waste their academic time to the pandemic. E-learning became a platform to ensure teachers connect with their students outside the classrooms. This study occurred among three purposively selected schools in Keffi Local Government Area Council of Nasarawa State, Nigeria. This research aimed to assess teachers' perceptions of adopting digital technologies in giving instructions during the pandemic. Findings from the study show that digital technologies were quite valuable and beneficial to the teachers in providing instructions to the students. Further findings reveal that even though digital technologies proved helpful in providing instruction to the students, teachers faced challenges like unstable power supply, high cost of purchasing data and distractions from family members and friends. The study, among others, recommends that government and private individuals invest heavily in infrastructure to enable teachers to be better equipped to give instructions via digital media technologies.

**Keywords:** E-learning, Covid-19, perception, media, digital technology

## Introduction

Education is considered a tool for improving human knowledge and capacity, and also helps mould society, thereby making the world more organized. In our competitive, modern and industrialized world, education has been found to play a huge role as it equips the people to be better prepared to survive (Sharna, 2018). It is so because modern societies are knowledge-driven, as people with the requisite understanding and ability are those with the capacity to implement solutions to make life easier. Corroborating the foregoing, Kiran (2021)

observed that individuals with high living standards and knowledge are the ones who are able to deploy better solutions to the problems of modern societies. Against this backdrop, alternative accesses are usually sought to ensure that people are not deprived of any form of knowledge-seeking endeavors, of which education is considered an integral part.

One of the ways people can seek education or knowledge is through e-learning. As an educational access point, e-learning is often considered to be a child of necessity as prevailing circumstances often necessitate it. Whether it is to improve learning, keep students engaged, or even ensure study time is not lost on the basis of students' inability to converge in a physical classroom for learning, it remains an important aspect of education in modern times. Also referred to as electronic or online learning, the term e-learning means acquisition of knowledge through electronic technologies and media (Ugochukwu-Ibe & Ibeke, 2021). It involves the use of electronic or digital means (often powered by prevailing technological innovations within a certain age or era) to acquire knowledge.

In modern times, e-learning allows students to stay connected in a virtual academic environment. During the pandemic, the importance of e-leaning became evident. Adetona, Ogunyemi and Oduntan (2021) in a study lend credence that as part of efforts to avail students the privilege to study during Covid-19-induced lockdown, Nigeria's Ministry of Education approved and introduced the use of e-leaning. Consequently, for the first time, educational institutions in Nigeria saw the need for technology in learning, and therefore took advantage of the situation to deploy several e-learning platforms. Findings from the research revealed that e-learning alternatives used by institutions in the country include YouTube videos, Google Classroom, and social media platforms such as WhatsApp (Adetona et al., 2021). Similarly, Alyoussef (2021) identified certain innovative networks of technology that aided immersive online or e-learning during Covid-19, including Coursera, Edmodo, social media platforms, and specially curated higher education platforms.

The internet together with related certain essential tools are required in order to actualize a successful technology-enabled learning. It has been observed that such technology and the internet play a major role in generating educational materials, provide seamless education for learners, and administer courses in an organization (Maatuk et al., 2021). For learners in diverse locations, e-learning is considered as a flexible means or channel of acquiring education. However, certain considerations put e-learning at the advantage of being considered flexible. According to Maatuk et al. (2021), these considerations include health issues, location, and time. Through providing access to large amounts of data and the environment for collaboration and building sustainable relationships within the learning domain, e-learning brings about an overall increase in skills and knowledge effectiveness. Maatuk et al. (2021) further agree that as helpful as e-learning may be in knowledge-acquisition, it still falls short in its evaluation as platform that support certain types of practical studies.

It must be re-emphasized that the surge in the quest to adopt e-learning in the country and in different countries of the world was a response to the disruption of physical learning possibilities occasioned by the Covid-19 outbreak. For example, a study established that as part of response to the pandemic, China's Ministry of Education introduced *the disrupted classes*,

*undisrupted learning* policy which mandated schools in the republic to activate a form of remote learning and teaching by ensuring the delivery of all curricula online (Li et al., 2022). Though supported by governments across different countries in sub-Saharan Africa, implementation of e-learning still faced several challenges. Maatuk et al. (2021) found that the Libyan case was that of internet infrastructure degradation and high electronic acquisition cost – both needed for smooth technology-based learning. In Nigeria, many issues impacted the implementation, especially across public-owned higher education institutions such as the secondary schools and universities. Aside from the technical and logistic problems of electricity, lack of technical know-how among others, universities in Nigeria were locked amid the Covid-19 pandemic outbreak due to the strike action by lecturers across public universities in Nigeria.

Regardless of the above raised issues, studies still supported the claims that there was e-learning in some educational institutions in Nigeria during the period under review (Eze et al., 2020; Ugochukwu-Ibe & Ibeke, 2021). Therefore, this study was conducted to extrapolate on the perception of teachers as to the adoption of technology in learning during the same period. This is with a view to gauge their perceptions, know the level of access, identify the tools or technologies adopted, ascertain the impact such learning channels or platforms have on performance of students, and probe into the challenges (if any) encountered by the teachers in their use of technology for learning.

Education in Nigeria is bedeviled by several challenges including that of poor funding and absence of requisite technologies (such as e-learning) that aid the building of a knowledge-based economy. Nevertheless, there are cases of adoption of these technologies across certain areas in the country. This is evident in the study carried out by Eze et al. (2020) which established that specific private higher education institutions in the country are ICT-compliant, and therefore recorded a successful deployment of e-learning facilities during the national lockdown era. However, public schools in Nigeria were not counted in this regard while the pandemic peaked. In other words, there are no records of successful deployment of e-learning by public institutions during the period under study.

E-learning allows students and teachers to interact, thereby eliminating the problems that could have arisen on the basis of distance or space, but there is still a problem of access. Studies conducted by various scholars in Nigeria and elsewhere in Africa have established that certain factors militate against the adoption of e-learning across institutions of learning. One such factor is access, which has become a major challenge because a number of secondary and tertiary institutions do not have adequate access to the requisite technologies (Eze et al., 2020). A similar study identified factors such as unstable power supply, high cost of data tariff, lack of technical know-how on the part of educators and learners, unavailability and poor maintenance of IT infrastructure as some of the problems facing the adoption and deployment of e-learning in Nigeria (Ugochukwu-Ibe & Ibeke, 2021). These problems all pose a challenge to the adoption of technologies in education in the country.

The Covid-19 pandemic presented unique times for businesses, sporting and schools as they were forced to shut down as part of efforts to enforce social distancing (Adedoyin &

Soykan, 2020). Several studies also established that the need for technology in education was inescapable during the pandemic (Almanthari, Maulina, & Bruce, 2020; Wang, Ng, & Brook, 2020). As a consequence of the shutdowns or lockdowns during the referenced period, educational institutions in Nigeria and elsewhere in the world had no choice as they had to adhere to restrictions on physical contact put in place as part of measures to mitigate the spread of the virus across the world. In Nigeria, the Nigeria Centre for Disease Control (NCDC) recommended shutting of educational facilities throughout the country. This situation prompted educational institutions to seek physical (on-site) learning alternatives. Considering that the pandemic era is unique and that electronic or digital learning remains undeveloped or underdeveloped in this part of the world, this study sought to gauge educators (teachers) ' perception of digital technologies for e-learning purposes during the period.

**Research Questions**

The study answered the following research questions:

1. What digital technologies are used by teachers for e-learning during Covid-19 national lockdown?
2. What is the impact of e-learning on students' academic performance during the lockdown period?
3. What are the perceptions of teachers with respect to flexibility in the adoption and use of e-learning facilities during the pandemic?
4. What challenges did teachers encounter in using digital technologies for e-learning during the national lockdown?

**Research Method**

The study aimed to discover teachers' perceptions in adopting digital technologies for E-learning during Covid-19 national lockdown. The strategy adopted for the study was the quantitative method of eliciting data through the use of survey. The area of study is Keffi Local Government Council of Nasarawa State Nigeria. The sample chosen in this survey is purposive in view of the fact that the three selected schools adopted E-learning during the national lockdown when schools were closed because of the Covid-19 pandemic. The schools include Kingdom Heritage Model School, Limit Breakers Academy and Brightway International Academy. The study population was comprised of secondary school teachers in the selected schools in Keffi LGA of Nigeria.

A total of 70 teachers form the population of the study. The data collection instrument was a structured questionnaire distributed to the teachers in the schools through the help of two research assistants. The questionnaire was made up of two sections – the first section comprised questions that sought information on demographic profile of the respondents while the second section were questions that gauge the perception of the teachers in respect of the adoption of digital technologies for virtual learning during the Covid-19 pandemic. The study was conducted in September 2022. It is important to state that those who participated in the study voluntarily did so. Beside the survey, materials for the study were collected through extensive

relevant literature search via the internet, journals, books and information from websites of organizations fighting the spread of Covid-19. These forms a bulk of secondary data used for the study.

## Literature Review

### E-learning and COVID-19

Unlike in developed countries, e-learning has been slowly introduced to Nigeria's educational system. However, it gained impetus following the outbreak of COVID-19 in December 2019 which birthed Nigeria's recorded index case on 27th February, 2020 through an Italian immigrant. COVID-19 is transmitted from person-to-person through coughing, sneezing, or touching. Therefore, those susceptible to it are the ones who are likely in physical contact with those infected (Udende, Akpede & Adisa, 2020). In order to abate the spate of vulnerability, political platforms and business centres that hitherto encouraged physical human contact were locked down leading to online interaction.

In the educational sphere, too, the COVID-19 outbreak altered physical teaching and learning as interaction became online when movement and physical contact was restricted. Therefore, the change from face-to-face interaction to online made it necessary for schools to see the need and adjust to integrate beneficial advanced technological skills in their teaching (Isaeva, Eisenschmidt, Vanari, & Kumpas-Lenk, 2020). As Alvarez (2020) has affirmed, the turbulent wave of health concern occasioned by COVID-19 was responsible for schools of learning, most especially in developing countries, to prematurely immerse their learners in an extreme learning situation through emergency remote teaching. This was to ensure undisruptive education of the moment. To further stretch what gave impetus to e-learning is a study by Li and Lalani (2020) which suggests that COVID-19 is responsible for the inevitable change to the status of learning in the 21st century. By this development, the instruction mode has been changed thereby privileging online instruction and at the same time subordinating physical interaction (Strielkowski, 2020).

E-learning is a shift from a traditional classroom to use of electronic technologies to access educational curriculum. Based on the conviction that this type of learning requires a technology-mediating environment, it is essential for teachers and students acquire and develop technical training and skills. As a result, both the student and teacher require some level of preparedness to be able to adapt to the e-learning environment. This will birth a synchronous adaptation in the learning environment and create a situation of ease in learning on the part of the students

Certainly, COVID-19 pandemic was and has continued to be a strong force destabilizing the political and economic realms and the educational sector in most parts of the world, especially the economically developed countries (Liu & Chen, 2021). Consequently, Naah (2020) has averred that the outbreak of COVID-19 led to a meteoric rise in popularity of information technology as several schools of learning have resorted to online teaching and learning. It was just the necessary thing to do because there could possibly have been n other

viable alternative to the use of technology following the several restrictions to physical environment learning.

Notwithstanding the need to integrate e-learning in schools of learning, the perception of stakeholders like teachers is bound to vary due to differences in demographics and psychographics. Notably, perception means the process of attaining awareness or understanding of (sensory) information (Qiong, 2017). This implies the way one thinks about something and the idea of what it is like or the natural ability to understand or notice things quickly. Babajide, Etejere and Awodiji (2021) elucidate that our perceptual outcomes are therefore the result of the physical and psychological dimensions of perception. But Qiong (2017) argues that rather than sensory organs (the physical dimension) that determine what directs people's attention to and interpret their feeling, knowledge and understanding, it is their values, attitudes or motives (the psychological dimension) that is responsible for the way they perceive things.

Research on how teachers perceive e-leaning and their attitudes toward it places high premium on instructors' role in facilitating interaction with students. With the objective of being successful in online education, instructors approve the available curriculum and the entire design for instruction. Similarly, it would be education suicide to compromise the need to improve on training of both staff and student inclined to online learning (Cheng & Chau, 2016). Therefore, any school of learning that fails to prioritize skills acquisition and expertise of staff and students on application and use of information and communication technologies that are instrumental to success of e-learning would only be superficially dealing with the new form of teaching and learning.

Spurred to investigate teachers' perception of e-learning, Rasmitadila et al. (2020) undertook a study. Data was drawn from 67 teachers in primary schools through the questionnaire structured along measures like flexibility of curriculum, technological preparedness, and facilitating roles of all stakeholders, i.e. institutions, teachers, guardians, community, and government, were crucial for Indonesia's online learning.

Beyond primary and secondary schools level, Demuyakor (2020) conducted a study on COVID-19 and online learning in higher education institutions. The findings showed that students, especially those outside of China face the problem of high cost of the Internet data. Given that online learning requires data to access learning resources, it would be difficult to achieve the objective if ability of students to get data diminishes, probably due to economic reality of the moment that disadvantages willing students who enroll e-learning programmes but are constrained by financial strength.

Similarly, Naah (2020) undertook a study titled "Pre-service teachers' perception of online teaching and learning during the COVID-19 era". The study adopted a quantitative descriptive survey research design to investigate pre-service teacher's perception of online teaching and learning during the COVID-19 era. The instrument of data collection was questionnaire. The study adopted a non-probability sampling technique of purposive sampling technique to select the respondents from Offinso College of Education in the Ashanti Region, of which 94 pre-service teachers were sampled. Out of this total, 49 females and 45 males were

pre-service teachers' trainees on a 4-year Bed Primary Education Programme pursuing General Chemistry as one of their core courses. Findings indicated that most of the pre-service teachers had an idea of the units taught for the semester. Pre-service teachers expressed great need for lessons to be delivered using video and audio as it makes lesson real and also see their tutor even though it required much data to access video. Further, pre-service teachers expressed interest in submission of assessment through WhatsApp platform. Despite the shortcomings associated with e-learning, finding showed appreciation of the cordial relationship between tutor and learner. The study, therefore, recommended stable network connectivity and subsidy on data bundle for learners.

**Merits of E-learning**

There are numerous benefits accompanying the shift from face-to-face teaching and learning process to e-learning. Not only teachers identify the advantages of planned online teaching activities, students also do (Hebebci; Bertiz, & Alan 2020). Some of the benefits are discussed below.

An overriding benefit is the protection of this form of teaching and learning against the COVID-19 pandemic era. Because e-learning blurred geographical distance, students were able to receive lessons from home without being exposed to health risks. Finding of a study by Serhan (2020) on how 31 students perceive as well as their attitudes toward the use of the Zoom application during the pandemic for teaching activities and their comparison with the face-to-face teaching is significant. According to Serhan's (2020) study, the main advantage of e-learning is noticeable in the flexibility of schedule of academic activities.

Other advantages of e-learning are: easily accessible, there was absence of disconnect of students with the study, it was economical as it saved cost especially when compared to cost that could be invested in traditional education, uninterrupted academic session and ultimately the likelihood of term or semester loss, easy to understand, less stressful, and learning new technologies (Shuchi, Tabassum, & Toufique, 2021).

Another remarkable advantage of e-learning is its offerings of multiple courses which schools deliver to diverse students in different parts of the world for learners to learn anytime. Hoq (2020), who expands the perimeters of numerous courses offered by diverse students adds that e-learning encourages larger students anywhere to take advantage the advance teaching and learning provides.

**Shortcomings of E-learning**

The swift transition from the traditional education to modern e-learning is without shortcomings and disadvantages. This probably inclined Naah (2020) to suggest the need for key stakeholders specifically students and teachers to adjust and adapt to the new ways of teaching and learning process.

Researchers (Hebebci, Bertiz & Alan, 2020; Naah, 2020; Serhan, 2020; Shuchi et al., 2021) have advanced a plethora of factors confronting e-learning to include how the teacher adjusts on effectively interact with learners online, modify ways of assessment, deployment of

relevant and appropriate technologies, explore friendly ways of getting funds meant for data and devising efficient and effective feedback mechanism for both the teacher and students. Besides, e-learning activities are perceived as attractive, interesting and accessible, but cannot serve as substitute for the socialization and physical interaction that predominantly ensue between and among teachers and peers.

A study by Shuchi et al. (2021) identified some major problems from students' perspectives that militate e-learning. Among these problems are inability of topic comprehension, inappropriateness of certain courses like mathematics, lack of concentration and attention, difficulty of seamless class interaction, lack of funds, adverse health impacts, device issues, power outages, unfamiliarity with digital technology, and unfixed class-schedule. This creates the impression that disadvantages outnumber advantages of e-learning. As a result, the study made some vital recommendations which include: adoption and use of modern digital tools, recording and uploading lectures, holding classes regularly, improvement on teaching methods for easy understanding of topics, lowering class duration, institutional support, implementing a fixed class schedule, and introducing online evaluation system (Shuchi et al., 2021).

Another research endeavour by Putri, Purwanto, Pramono, Asbari, Wijayanti and Hyun (2020) made use of a qualitative case study approach. The objective was to identify the shortcomings of online learning in Indonesian primary schools. Findings showed that students are constrained from communicating and socializing during the pandemic era unlike during the pre-pandemic era; are required to look at the screen for a longer time, the problem of physically, visually and aurally challenged students was compounded.

Prompted by the desire to find out the causal effects of online learning on students' academic performance, Clark et al. (2020) used administrative data from three middle schools in China. The researchers employed the difference-in-difference approach in their analysis. Findings showed a disproportionate level of performance between students receiving online lessons than students in schools not offering online education. Findings further indicate that students with access to online lectures of high-quality external teachers and those using computers did better than those without access to online materials of internal teachers and those using smartphones, respectively.

In a study, Serhan (2020) who identified some advantages of e-learning also came up with some disadvantages which include the negative effects on motivation and learning experiences, lack of familiarity of instructors with the platform, technical difficulties and inability to procure data and difficulty in accessing the Internet probably due to power outage or weak bandwidth or both.

Despite the multiple disadvantages which seemingly mask the benefits of e-learning that is briskly becoming a new normal in Nigeria, it becomes imperative for Nigeria's governments at all levels and other stakeholders to appropriate the opportunity and further invest in technological inventions for identification of new teaching methods in e-learning, galvanize both teachers and students to embrace the e-learning culture.

## Results

In this section, we have gathered and critically analysed all the information we elicited from the study's respondents.

**Table 1.** Demographic Profile

| Variables | Frequency | Valid Percent |
|---|---|---|
| *Gender* | | |
| Male | 25 | 35.7% |
| Female | 43 | 62.9% |
| Error | 1 | 1.4% |
| *Age*: | | |
| 20 -29 | 20 | 28.6% |
| 30 – 39 | 35 | 50.0% |
| 40 – 49 | 10 | 14.3% |
| 50 – Above | 5 | 7.1% |
| *Marital Status*: | | |
| Single | 30 | 42.9% |
| Married | 39 | 55.7% |
| Error | 1 | 1.4% |
| *Education*: | | |
| NCE / ND | 22 | 31.4% |
| HND / BSC | 32 | 45.7% |
| Postgraduate | 16 | 22.9% |
| *Position of Responded*: | | |
| Form or class Teacher | 34 | 48.6% |
| Principal, HOD , Head of Unit | 30 | 42.9% |
| Subject Teacher | 5 | 7.1% |
| Error | 1 | 1.4% |
| *Field Survey, 2023* | | |

Table 1 shows the survey conducted on 70 respondents, indicating that the majority of respondents that participated in the study were female, which accounted for 62.9%, and males were 35.7%. In terms of age range, majority of the participants were within the age brackets of 30 and 39 (50%), followed by 20-29 which accounted for 28.6% and the least is 71% accounting for 5 respondents. Marital status of respondents shows that 55.7% were married while 42.9% were single. Education wise, most respondents 45.7 % had Higher National Diploma and Bachelor of Science while 31.4% had National Certificate of education. 22.9% of the respondents claimed to possess Postgraduate National Diploma. Concerning the respondent's position in the school, most respondents 48.6% affirm they held the position of form/class teacher, 42.9% said Principal/HOD and head of unit, and the least which accounted for 7.19% indicated that they were subject teachers. Implication of this is that they have first-hand knowledge of what it takes to deploy e-learning within the institution of learning. In addition, the average age brackets of respondents indicate that they are of maturity to take the survey. In the area of education, findings of this study imply that respondents have the requisite education needed to know the subject matter. It also depicts mental preparedness to take the survey regardless of the questions.

**Table 2.** Digital technologies adopted for E-learning during Covid-19

| Variables | Frequency | Valid percent |
|---|---|---|
| Mobile phone | 31 | 44.3% |
| Tablet | 10 | 14.3% |
| Computer | 15 | 21.4% |
| Laptop | 14 | 20.0% |
| **Field Survey, 2023** | | |

Table 2 illustrates the various digital technologies adopted for e-learning during the Covid-19 national lockdown in the various schools. Findings indicated that 44.3% of the teachers used mobile phone devices, 14.3% used tablets, 21.4% deployed computer while 20.0% of the teachers used laptop devices to give instructions to pupils. A similar study by Yadav, Arora, Kumari and Nandal (2020) lend credence to the fact that mobile phones are the popular devices that educators and students use for e-learning in India because mobile phones are cheaper and easy to access.

**Table 3.** Virtual Platforms adopted for E-learning during Covid-19

| Variables | Frequency | Valid percent |
|---|---|---|
| WhatsApp | 25 | 35.7% |
| Zoom | 10 | 14.3% |
| Google meet | 5 | 7.1% |
| Moodle | 10 | 14.3% |
| Telegram | 20 | 28.6% |
| **Field Survey, 2023** | | |

Table 3 shows the different virtual platforms that the teachers employed to facilitate teaching. Out of the total number of the teachers that is 70, 35.7% used WhatsApp, 14.3% utilized Zoom, 7.1% deployed Google meet, 14.3% made use of moodle while 28.6% affirmed that they deployed Telegram platform.

**Table 4.** Impact of E-learning on students' academic performance

| Variables | Frequency | Valid percent |
|---|---|---|
| Strongly agree | 10 | 14.3% |
| Agree | 42 | 60.0% |
| Neutral | 8 | 11.4% |
| Strongly disagree | 5 | 7.1% |
| Disagree | 5 | 7.1% |
| **Field Survey, 2023** | | |

Table 4 reveals the impact of E-learning on the academic performance of the pupils. From the available data harvested from the field, data shows that 14.3% strongly agreed that e-learning impacted the pupils, majority of respondents 60.0% agree that e-learning improve pupils academic performance, 11.4% were neutral, 7.1% strongly disagree to the effect that e-learning impacted on the academic achievement of the pupils while 7.1% also disagree to that effect. Previous study conducted by Clark et al. (2020) in China supports this finding based on

their research which revealed that students receiving online lessons from schools performed better than students in schools not offering online education.

**Table 5.** Teacher's perception of E-learning during Covid-19

| Variables | Frequency | Valid percent |
|---|---|---|
| E-learning is indispensable in education today | 12 | 17.1% |
| E-learning enhances interaction with students | 8 | 11.4% |
| E-learning saves more time | 9 | 12.9% |
| E-learning enhances self-study | 22 | 31.4% |
| It enhances quick feedback and make learning fun | 19 | 27.1% |
| Total | 70 | 100.0% |
| **Field Survey, 2023** | | |

Table 5 illustrates the teachers' perception regarding the use of e-learning during the Covid-19 national lockdown. A majority of 31.4% of the respondents said e-learning enhances self-study, 27.1% affirmed that it encourages quick feedback and makes learning fun, 17.1% opined that e-learning has become indispensable in the education sector in contemporary times. The result further shows that 12.9% of the teachers said that e-learning saves more time in the learning process and 11.4% of the teachers opined that e-learning enhances and encourages interaction with the pupils.

**Table 6.** Challenges faced by teachers in utilizing digital technologies for E-learning

| Variables | Frequency | percent |
|---|---|---|
| Unstable network | 21 | 30.0% |
| Frequent power outages | 14 | 20.0% |
| High cost of data | 21 | 30.0% |
| Technical problems | 4 | 5.7% |
| Distractions at home from family members and friends | 10 | 14.3% |
| **Field Survey, 2023** | | |

In the course of the survey, teachers were asked to identify the challenges they faced in utilizing digital technologies for instructions. Table 6 indicates that a majority of 30.0% opined that cost of purchasing data was a major setback. A significant percentage of 30.0% of the respondents said the unstable supply of power was another challenge they faced. Further findings show that 14.3% in the survey identify distractions at home from family members and friends as a challenge and 5.7% believed that they encountered some technical challenges with their digital devices while giving instructions to the pupils. The findings of this study aligns with a previous study conducted by Eze et al. (2020) which identified factors such as unstable power supply, high cost of data tariff, lack of technical know-how on the part of educators and learners as major impediments to the utilization of e-learning among schools in Nigeria.

**Discussion**

The rationale behind conducting this survey was to investigate teachers' perception of adopting digital technologies for instruction amid the Covid-19 national lockdown in Nigeria. Findings from the data obtained from our analysis provided the bases for concluding this study. The study showed that digital technologies proved helpful and beneficial to teachers in administering instruction during the pandemic. Our findings shows that the most popular digital technology devices adopted by teachers for instructions includes mobile phones (44.3%), tablets (14.3%), computers (21.4%) and laptops (20.0%). These devices were quite instrumental in aiding the teachers in facilitating instructions remotely. This is also in sync with Santas, Inobemhe and Kente (2021) position on adopting e-learning tools within the COVID-19 pandemic era.

Researchers went further to discover the dominant virtual platforms the teachers utilized for conducting e-learning instruction. Findings revealed that Telegram (28.6%), WhatsApp (14.3%) and Google meet (14.3%) were the most utilized virtual platforms that facilitated e-learning among the teachers amid the pandemic. This goes further to reiterate the notion that digital technologies provided ample platforms for teachers to engage with their pupils despite the introduction of lockdown occasioned by Covid-19. This aligns with the findings of a study conducted by Gopika and Rekha (2023) where an increase in the use of digital technology for learning was reported during the COVID-19 pandemic outbreak that forced education institutions to adopt the alternative to in-person teaching and learning. Similarly, a study by Adekunle and Opeyemi (2021) showed greater use of social media platform like WhatsApp among students amid the COVID-19 pandemic outbreak in Nigeria.

Further results of the study indicated that digital technologies impacted positively on the academic performance of the pupils despite the fact that they received instruction remotely. This was validated by the respondents (60.0%) agreeing that e-learning improved pupil’s academic performance during the pandemic period. In addition, the perception of the teachers in relations to the utilization of digital technologies for e-learning was generally positive. Most respondents (31.4%) affirmed that e-learning enhances self-study while (27.1%) of the teachers affirmed that digital technologies encourage quick feedback and make learning fun. A study by Adekunle and Opeyemi (2023) also showed positive impact in the use of e-learning facilities during the pandemic.

Notwithstanding the advantages of e-learning or the application of digital technologies for instructions, there are some certain challenges. Some of these challenges have to do with unstable power supply, high cost of purchasing data and distractions from homes due to family members and friends. These challenges to some extent affected the teachers in the course of given instructions to the pupils. It is the conviction of this study that the Nigerian government should invest heavily in upgrading the country's current IT infrastructure to enable digital learning to thrive in the education sector.

## Conclusion

On the basis of the findings of this study, it is concluded that teachers utilised digital technologies during the COVID-19 pandemic and that mobile phones were a prominent device adopted for this purpose. Accordingly, e-learning became the alternative to physical classroom appearance within period under review. This is an indication that digital technologies in the classroom have proved to be useful during the pandemic. It is also part of the conclusion of this study that adopting and utilising e-learning technologies in the classroom during health emergencies is an effective way to continue teaching and learning despite its shortcomings.

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## Ethics declaration

The authors declared that the participants voluntarily participated in the study. Their consent for participation were duly sought and granted, their identity was duly protected with utmost confidentiality.

## Declaration of interest

The authors declare that they have no competing interests.

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