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SHOCKWAVES OF COVID-19 PANDEMIC ON EDUCATION AND THE ALTERNATIVE USE OF ICT IN ADAMAWA STATE COLLEGE OF NURSING AND MIDWIFERY, YOLA, NIGERIA

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ABSTRACT

This study examined the effects of the COVID-19 pandemic on education and explored the role of Information and Communication Technology (ICT) as an alternative tool for enhancing teaching and learning. A descriptive survey research design was adopted. The study was conducted at the Adamawa State College of Nursing and Midwifery, Yola, Nigeria, with a total of 172 respondents comprising 122 student nurses and midwives and 50 academic staff, selected through simple random sampling. Data were collected using a validated 16-item questionnaire and analyzed using descriptive statistics, including frequency counts and percentages. The findings revealed that the COVID-19 pandemic significantly disrupted academic activities through school closures, extended study durations, and barriers to the teaching and learning process. Furthermore, results indicated that ICT tools such as e-learning platforms, videoconferencing, and internet-based applications are effective in enhancing teaching and learning. It is recommended that government and educational stakeholders commit to integrating ICT-based approaches into Nigeria's educational framework to ensure continuity of learning during future crises.

Keywords: COVID-19, education disruption, ICT, online learning, digital divide, Nigeria, pandemic

Introduction

The COVID-19 pandemic is a new strain of coronavirus first identified in Wuhan, China, in December 2019, and subsequently declared a global pandemic by the World Health Organization (WHO) on March 11, 2020 (Reviews, 2021). The pandemic spread rapidly across the globe, compelling governments to implement lockdowns and leading to the closure of all educational institutions (Malhotra, 2021). This unprecedented disruption affected virtually every aspect of human life, including education, travel, commerce, healthcare, and social interaction.

In Nigeria, as in many other countries, the lockdown resulted in the suspension of academic activities across all levels of education, from primary schools to universities. Students could no longer physically interact with their teachers or peers, and the traditional chalk-and-talk classroom model was rendered inoperative (Muhie, 2020). This exposed a significant weakness in Nigeria's educational system: its over-reliance on face-to-face instruction and its limited adoption of technology-enhanced learning alternatives.

While the pandemic accelerated the global shift toward digital and online education, learners in Nigeria—particularly those in rural and underserved communities—faced multiple barriers to participation in remote learning. These included lack of digital literacy, poor internet infrastructure, unreliable electricity supply, and inadequate access to ICT devices (Davies, 2021; Reviews, 2021). Even university students with some digital skills found themselves constrained by poor connectivity and absence of institutional ICT infrastructure.

Despite these challenges, ICT has been widely recognized as a transformative tool capable of facilitating continuity of education during crises. Online platforms such as Google Classroom, Zoom, Telegram, and WhatsApp, as well as virtual libraries and asynchronous learning environments, have been adopted globally to sustain educational activities (Mohanty, 2021). However, many Nigerian public institutions have not fully embraced ICT in their educational delivery, even prior to the pandemic (Muhie, 2020).

This study, therefore, sought to examine the effects of the COVID-19 pandemic on education and to explore how ICT can serve as an effective alternative tool for enhancing teaching and learning, particularly within the Nigerian context.

Statement of the Problem

Education is a fundamental human right and a cornerstone of national development (Patil et al., 2021). The COVID-19 pandemic created the largest disruption of education systems in history, affecting approximately 1.6 billion learners from more than 190 countries and nearly 91 percent of the global student population, according to UNESCO. In Nigeria, this disruption was compounded by existing deficiencies in ICT infrastructure, digital access, and institutional preparedness for remote learning.

Despite growing evidence of the role of ICT in sustaining education during disruptions, many Nigerian institutions—especially public nursing and allied health colleges—have not systematically adopted ICT tools for teaching and learning. There is, therefore, a need to assess the extent of the pandemic's educational impact and to identify effective ICT-based strategies that can enhance learning continuity in such settings.

Objectives of the Study

This study was guided by the following objectives:

i. To examine the effects of the COVID-19 pandemic on teaching and learning at the Adamawa State College of Nursing and Midwifery, Yola.
ii. To identify ICT-based tools and strategies that can enhance teaching and learning in Nigerian educational institutions.
iii. To evaluate the willingness of students and academic staff to adopt ICT as a mode of instruction.

Research Questions

The following research questions guided the study:

iv. What are the effects of the COVID-19 pandemic on education?
v. What are the possible ways through which ICT can enhance teaching and learning?

Literature Review

COVID-19 Pandemic and Education

COVID-19 is caused by a novel strain of the coronavirus family, which also includes SARS-CoV and MERS-CoV. The current COVID-19 pandemic originated in Wuhan, China, in December 2019, when clusters of pneumonia cases of unknown origin were identified (Patil et al., 2021). The virus is transmitted through inhalation of or contact with infected respiratory droplets and is associated with symptoms ranging from mild fever, cough, and fatigue to severe respiratory distress and death. The WHO officially declared COVID-19 a global pandemic in March 2020, prompting governments worldwide to impose lockdowns, travel restrictions, and social distancing measures (Reviews, 2021).

Prior coronavirus outbreaks—including SARS-CoV in 2003 and MERS-CoV in Saudi Arabia—also disrupted educational activities, though on a smaller scale. During the SARS outbreak in Hong Kong, 17 medical students at the Chinese University of Hong Kong became infected, leading to suspension of clinical training and academic meetings across all educational levels (Patil et al., 2021). In Canada, clinical activities were cancelled for healthcare students across medicine, pharmacy, nursing, dentistry, and physical therapy programs, and no academic penalties were imposed given the extraordinary circumstances (Nambiar, 2020). These precedents informed institutional responses to COVID-19, including the rapid transition to online and virtual learning environments.

The scale of disruption caused by COVID-19 was, however, far greater than any previous outbreak. School closures affected nearly 1.6 billion learners globally, with particularly devastating consequences in low-income and middle-income countries like Nigeria, where the digital infrastructure necessary for remote learning was either inadequate or entirely absent (Patil et al., 2021).

The Concept of ICT in Education

Information and Communication Technology (ICT) refers to a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information (Soeiono, 2021). ICT encompasses electronic devices, networking components, software applications, and digital systems that collectively enable individuals and organizations to interact in the digital world (Hamdan et al., 2020). In education, ICT includes tools such as computers, mobile devices, internet-based platforms, virtual learning environments, and educational software applications.

The rapid growth of ICT has fundamentally reshaped how work is done, including in the educational sector (Ajayi, 2020). Factors driving ICT adoption in education include the globalization of information, technological innovation, the emergence of a knowledge-based economy, and escalating demand for flexible and accessible education (Hamdan et al., 2020). Through ICT, students can engage in self-directed learning, access content not covered in formal curricula, submit assignments digitally, and interact with instructors remotely. Teachers, on the other hand, can record and share lectures, provide timely feedback, and manage course content efficiently.

ICT-Based Learning During the COVID-19 Pandemic

The closure of academic institutions during the pandemic necessitated an urgent shift to online and blended instructional modes. Institutions worldwide adopted synchronous online lecture meetings via platforms such as Zoom and Google Meet, as well as asynchronous delivery systems including pre-recorded lectures, virtual labs, digital simulations, and e-

learning platforms (Malhotra, 2021). Some institutions also leveraged open educational resources and mobile applications to reach students with limited internet access.

In developing countries like Nigeria, the transition to online learning was challenging. Rural and underserved learners faced significant barriers, including lack of digital devices, poor internet connectivity, and absence of reliable electricity (Davies, 2021; Reviews, 2021). The digital divide widened as students from economically disadvantaged backgrounds were unable to participate effectively in online learning. Government commitment and stakeholder investment in ICT infrastructure remained limited, further impeding the educational response to the pandemic.

Empirical Review

A number of studies have examined the effectiveness of ICT and online learning during the COVID-19 pandemic. Khan (2021) investigated the effectiveness of online/distance learning in Saudi Arabia and found that both students and teachers regarded online platforms as efficient and beneficial for teaching and learning. Notably, no major technical difficulties were reported, and a significant proportion of students were willing to transition to online modes to prevent academic loss. Teachers also affirmed the practical advantages of online instruction, including flexibility of time and location.

Similarly, Rama et al. (2020) found positive attitudes among science teachers toward online teaching, confirming readiness to adopt digital tools when appropriate resources are available. These findings suggest that when supported by adequate infrastructure and training, ICT can serve as a reliable substitute for traditional classroom instruction.

In the African context, Ndubisi et al. (2021) examined the relationship between COVID-19, ICT, and education systems in Africa, highlighting the critical gap in digital readiness among African educational institutions. The study found that while ICT adoption holds great promise, structural barriers—including poor infrastructure and inadequate government investment—significantly constrain its effectiveness. These findings are consistent with the challenges facing Nigerian institutions such as the Adamawa State College of Nursing and Midwifery, where this study was conducted.

Methodology

Research Design

This study adopted a descriptive survey research design. Descriptive survey designs are appropriate for investigating phenomena as they naturally occur within a defined population, without manipulation of variables (Ndubisi et al., 2021). This design was selected because it facilitates the collection of large-scale data from a defined population, maintains objectivity and accuracy, and is cost-effective and time-efficient. It is particularly suitable for exploring participants' perceptions and experiences regarding the impact of COVID-19 on education and the potential of ICT for enhancing teaching and learning.

Population and Sample

The target population for this study comprised all students and academic staff of the Adamawa State College of Nursing and Midwifery, Yola, Nigeria. The sample consisted of 122 student nurses and midwives who enrolled in ICT as a compulsory course under the Basic and Applied Science Department, and who were directly affected by COVID-19-related academic disruptions. Additionally, 50 academic staff members were included, bringing the total sample size to 172 respondents.

A simple random sampling technique was employed to select participants. This probability sampling method ensures that every member of the target population has an equal and independent chance of being selected, thereby minimizing selection bias and enhancing the representativeness of the sample (Muyambe, 2019).

Research Instrument

Data were collected using a researcher-designed questionnaire comprising 16 items organized into two sections. Section A gathered demographic information from respondents, including gender and academic status. Section B consisted of 16 Likert-scale items addressing the effects of COVID-19 on education and the role of ICT in enhancing teaching and learning. Responses were rated on a five-point Likert scale: Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1).

The instrument was validated through a pilot study conducted among a subset of respondents who were not part of the main sample. Validity was assessed by examining the instrument's ability to measure the intended constructs. Reliability was ensured by reviewing item consistency and clarity based on pilot feedback before the final administration.

Data Collection and Analysis

The validated questionnaire was administered to the selected students and academic staff using the simple random sampling procedure. Completed questionnaires were retrieved and screened for completeness. Data were analyzed using descriptive statistics, specifically frequency counts and percentages, which are appropriate for summarizing categorical and ordinal data. Results were presented in tables and interpreted in relation to the research questions.

Results

Demographic Data

Table 1: Demographic characteristics of respondents (N = 172)

Variable	Category	Frequency	Percentage
Gender	Male	71	41%
	Female	101	59%
Total		**172**	**100%**
Status	Students	150	87%
	Lecturers	22	13%
Total		**172**	**100%**

Table 1 presents the demographic characteristics of the 172 respondents. With respect to gender, 71 respondents (41%) were male and 101 (59%) were female. The higher proportion of female respondents is consistent with the composition of the student population at a nursing and midwifery college, as the Midwifery programme is restricted to female students. Regarding academic status, 150 respondents (87%) were students and 22 (13%) were lecturers.

Research Question 1: Effects of COVID-19 on Education

Table 2: Respondents' views on the effects of COVID-19 on education (N = 172)

Item	SA (5)	SD (4)	A (3)	D (2)	U (1)
COVID-19 causes direct effects on teaching and learning.	80 (46.5%)	7 (4.1%)	75 (43.6%)	5 (2.9%)	5 (2.9%)
COVID-19 pandemic put a barrier on the process of teaching and learning through lockdown.	65 (37.8%)	5 (2.9%)	90 (52.3%)	7 (4.1%)	5 (2.9%)
COVID-19 pandemic resulted in the closure of schools, affecting billions of learners worldwide.	100 (58.1%)	10 (5.8%)	50 (29.1%)	4 (2.3%)	8 (4.7%)
COVID-19 pandemic resulted in longer duration of studies and disrupted the academic calendar.	119 (69.2%)	11 (6.4%)	35 (20.3%)	2 (1.2%)	5 (2.9%)
The COVID-19 pandemic challenged the educational system and process globally.	80 (46.5%)	5 (2.9%)	60 (34.9%)	7 (4.1%)	20 (11.6%)

The data in Table 2 show that the majority of respondents agreed that COVID-19 had significant negative effects on education. For item 1, 80 respondents (46.5%) strongly agreed and 75 (43.6%) agreed that COVID-19 caused direct effects on teaching and learning, yielding a combined agreement rate of 90.1%. For item 2, 65 respondents (37.8%) strongly agreed and 90 (52.3%) agreed that the pandemic created a barrier to teaching and learning through lockdown, for a combined agreement rate of 90.1%. Item 3 received the highest level of agreement, with 100 respondents (58.1%) strongly agreeing and 50 (29.1%) agreeing that the pandemic led to school closures affecting billions of learners worldwide.

Item 4 recorded the strongest agreement across all items, with 119 respondents (69.2%) strongly agreeing and 35 (20.3%) agreeing that the pandemic resulted in longer study durations and disrupted academic calendars. For item 5, 80 respondents (46.5%) strongly agreed and 60 (34.9%) agreed that COVID-19 had challenged the global educational system. Overall, these findings consistently demonstrate that respondents perceived the COVID-19 pandemic as a severe disruption to educational processes at institutional, national, and global levels.

Research Question 2: ICT as a Tool for Enhancing Teaching and Learning

Table 3: Respondents' views on ICT enhancement of teaching and learning (N = 172)

Item	SA (5)	SD (4)	A (3)	D (2)	U (1)
The use of e-learning methods will enhance teaching and learning.	75 (43.6%)	8 (4.7%)	80 (46.5%)	5 (2.9%)	4 (2.3%)
Use of platforms such as Zoom, Google Classroom, and Telegram can enhance teaching and learning.	40 (23.3%)	10 (5.8%)	100 (58.1%)	10 (5.8%)	12 (7.0%)
Videoconferencing and other virtual learning methods can enhance the teaching and learning process.	94 (54.7%)	2 (1.2%)	59 (34.3%)	3 (1.7%)	14 (8.1%)
Access to internet connectivity can facilitate the teaching and learning process.	114 (66.3%)	2 (1.2%)	50 (29.1%)	2 (1.2%)	4 (2.3%)
Availability of ICT gadgets can facilitate the teaching and learning process.	52 (30.2%)	10 (5.8%)	85 (49.4%)	5 (2.9%)	20 (11.6%)

Table 3 presents respondents' views on how ICT can enhance teaching and learning. For item 1, 75 respondents (43.6%) strongly agreed and 80 (46.5%) agreed that e-learning methods can enhance teaching and learning, for a combined agreement rate of 90.1%. For item 2, 40 respondents (23.3%) strongly agreed and 100 (58.1%) agreed that platforms such as Zoom, Google Classroom, and Telegram can enhance teaching and learning, yielding a combined agreement rate of 81.4%.

Item 3 showed that 94 respondents (54.7%) strongly agreed and 59 (34.3%) agreed that videoconferencing and other virtual learning methods can enhance the teaching and learning process, for a combined rate of 89.0%. Item 4 received the highest overall agreement, with 114 respondents (66.3%) strongly agreeing and 50 (29.1%) agreeing that internet access can facilitate teaching and learning. For item 5, 52 respondents (30.2%) strongly agreed and 85 (49.4%) agreed that ICT gadget availability can enhance learning, for a combined rate of 79.6%.

Discussion of Findings

The findings of this study align with and extend existing evidence on the impact of COVID-19 on education and the role of ICT in educational continuity. The high agreement rates regarding COVID-19's disruptive effects on education (ranging from 75.8% to 89.5% combined agreement across items) are consistent with Patil et al. (2021), who documented widespread school closures affecting over 1.6 billion learners globally. In the Nigerian context, the pandemic's consequences were amplified by existing infrastructural deficiencies, which made the shift to online learning particularly challenging (Muhie, 2020; Davies, 2021).

The finding that 69.2% of respondents strongly agreed that the pandemic prolonged study durations reflects a critical institutional challenge in the Nigerian healthcare training sector, where clinical hours and regulatory requirements constrain academic flexibility. This finding is consistent with Nambiar (2020), who documented disruptions to clinical training in Canada during the SARS epidemic, and reinforces the importance of contingency planning in professional training programmes.

Regarding ICT's role in enhancing learning, the strong agreement across all items in Table 3—particularly the 95.4% combined agreement on internet connectivity (item 4)—corroborates Khan (2021), who found that online learning platforms were perceived as efficient and beneficial by both students and teachers in Saudi Arabia. Similarly, Rama et al. (2020) reported positive teacher attitudes toward online instruction, suggesting that willingness to adopt ICT is present when infrastructure and resources are available. The results therefore indicate that respondents at the Adamawa State College of Nursing and Midwifery recognize ICT's potential, even if current infrastructure constraints limit full adoption.

The relatively lower agreement on the availability of ICT gadgets (79.6% combined agreement) and digital platforms (81.4%) compared to internet access (95.4%) suggests that device ownership and platform familiarity remain barriers that must be addressed through targeted institutional investment and digital literacy programmes.

Conclusion

This study investigated the effects of the COVID-19 pandemic on education and the potential of ICT to enhance teaching and learning at the Adamawa State College of Nursing and Midwifery, Yola. Data were collected from 172 respondents comprising student nurses, midwives, and academic staff. The findings revealed that COVID-19 significantly disrupted educational activities through school closures, academic calendar disruptions, and barriers to the normal teaching and learning process. Furthermore, the study demonstrated that ICT tools—including e-learning platforms, videoconferencing applications, internet-based resources, and digital learning gadgets—are widely perceived by students and staff as effective means of enhancing teaching and learning and ensuring educational continuity during crises. These findings underscore the urgent need for Nigerian educational institutions, particularly in the healthcare sector, to invest in ICT infrastructure and digital literacy, and to develop institutional policies that integrate technology-enhanced learning into routine educational delivery. Preparedness for future disruptions depends on building sustainable ICT capacity now.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Government and educational authorities should develop and fund a comprehensive national ICT policy for Nigerian tertiary institutions, with specific provisions for healthcare training colleges, to ensure adequate provision of devices, internet connectivity, and digital learning platforms.
2. Academic institutions should integrate ICT-based delivery methods—including e-learning platforms, virtual labs, and asynchronous content—into their regular curricula, so that students and staff are familiar with these tools before a crisis occurs.
3. Colleges of nursing and midwifery should establish partnerships with technology providers and telecommunications companies to improve internet access and device availability for students and staff, particularly those in rural areas.
4. Academic staff should receive regular training in the use of ICT tools for teaching, content development, and online assessment, to build instructional competence and confidence in digital delivery.
5. Future research should investigate specific barriers to ICT adoption in Nigerian healthcare training institutions and evaluate the effectiveness of particular platforms and interventions in this context.

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