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Unlocking the Potential of E-Learning in Zamfara State: A Study on Awareness, Access, and Utilization Among Upper Basic and Senior School Teachers

[*1]Muhinat Bolanle Bello and [2]Idris-Iyekolo Olushola

[*1&2]Department of Social Sciences Education, Faculty of Education, University of Ilorin, Kwara State, Nigeria **Email:** 1bello.mb@unilorin.edu.ng **ORCID**: https://orcid.org/0000-0001-5181-7908[1] **Email:** iyekolo.oa.@unilorin.edu.ng[2]

Abstract

The study conducted in Zamfara State, Nigeria, assesses the awareness, accessibility, and utilization of e-learning facilities among upper-basic and senior school-teachers. A descriptive research design was adopted for the study. A sample size of 356 teachers from 15 public schools in Bukkuyum, Bungudu, and Zurmi LGAs participated in the research. The instrument used for data collection was a researchers'-designed questionnaire focusing on "Awareness, Availability, Accessibility, Usability, and Challenges of E-learning Facilities for Teaching." This questionnaire demonstrated psychometric properties of content validity and a reliability index of 0.84. Data was collected through self-administration with the assistance of five research assistants. Results and Discussion: The findings revealed that a significant percentage of teachers were unaware of available e-learning facilities, facing challenges related to internet connectivity, technical support, electricity supply, affordability of tools, and digital literacy. Conclusion: This study underscores the need for increased awareness, training, and infrastructure improvement to enhance the effective integration of e-learning in educational practices in Zamfara State.

Keywords: E-learning, Availability, Awareness, Challenges, Accessibility and Utilizability

Introduction

Technology is significant in education and training globally, enhancing both teaching and learning. The incorporation of Information and Communication Technology (ICT) into educational delivery has introduced e-learning, transforming the traditional teacher-centered approach into a more learner-centered model (Evarest & Laura, 2011). E-learning, increasingly popular in tertiary institutions worldwide, leverages ICT to support and enhance teaching, learning, and research. ICT has created a dynamic environment for interactive learning, replacing basic teaching aids with advanced technological tools (Saheed et al., 2019). Despite several programs promoting the use of IT in Nigerian Higher Education Institutions (HEIs), the adoption of IT innovations like e-service has only recently begun transforming these institutions from traditional methods to more contemporary approaches (Al-Gahtani, 2016).

E-learning involves IT-based innovations that offer alternative and innovative learning methodologies compared to conventional methods. These technologies include

systematic feedback systems, computer-based networks, video and audio conferencing, internet websites, and computer-assisted instruction, significantly expanding the possibilities for lifelong learning (Ajayi, 2008). Both lecturers and students are particularly enthusiastic about e-learning's potential for just-in-time learning delivery. The application of ICT in education has introduced new terminologies such as e-teaching and e- learning, facilitated via the internet. E-learning, or electronic learning, involves teaching and learning using computers and the Internet. This method includes sending structured instructional materials electronically from instructors to learners and receiving assignments electronically for feedback (Erah, 2006). E-learning enhances learning by providing flexible access to educational resources and fostering greater interaction between teachers and students.

For successful e-learning implementation, it is essential to assess an organization's readiness, including the willingness of students, teachers, administrative staff, and developers to adopt e-learning facilities. Countries must ensure "e-readiness" regarding ICT amenities and regulatory frameworks to support e-learning (CIPESA, 2023). Educators and researchers believe that e-learning can revolutionize education by providing more access to information and communication, ultimately improving education quality and reducing costs. The demand for e-learning is high among teachers and students due to its cost-effectiveness, flexibility, elimination of distance barriers, and support for diverse learning needs (Gold, 2001). The rapid growth of e-learning is influenced by the high demand and supply of e-learning products and channels (Okoro, 2008). However, the uptake of e-learning technologies in many institutions remains slow, particularly in developing countries like Nigeria, where the pace of development and utilization is low compared to developed countries.

The quality of teaching and learning in Nigerian secondary schools has faced significant disruptions, notably due to the COVID-19 pandemic, which necessitated global lockdowns to curb the virus's spread. These disruptions threaten the objectives of the secondary school curriculum. However, technology can alleviate the adverse effects of these disruptions. Technology has transformed the world into a global village (Oluwalola & Awodiji, 2019) and has provided instructional materials that ease the stress of achieving educational objectives. Educational technology involves analyzing, designing, developing, implementing, and evaluating instructional environments, learning materials, learners, and the learning process to improve education.

Instructional materials assist in classroom teaching, reducing the need for repetitive explanations and easing the struggles of teachers and students. Technology offers various opportunities to overcome physical disruptions in education. Halim et al. (2020) argue that the development of education is intertwined with advancements in science and technology. Akanbi and Akanbi, (2012) adds that technology enhances teaching and learning inside and outside school premises. This advantage over traditional face-to-face teaching, which can be disrupted by strikes, natural disasters, and pandemics, makes technology a vital educational tool.

Computer-Assisted Instruction (CAI), an integral part of educational technology, exemplifies how technology facilitates development and innovation. Ramma et al. (2018) emphasize that technology in education serves as an information source rather than just a knowledge-construction process. Fully leveraging technological products can enhance teaching and learning outcomes. Kopish and Marques (2020) highlight that technology enables collaborative work between institutions in different countries and allows learners to take an active role through various instructional modes.

For e-learning to succeed, it is crucial to assess the readiness of stakeholders, including students, teachers, administrative staff, and e-learning developers. A country must be "e-ready" regarding ICT amenities and accessibility, supported by an appropriate legal and regulatory framework. Educators and researchers hope that e-learning will revolutionize education by providing greater access to information and communication. E-learning technologies can transform how and when learners engage with educational content. These technologies include systematic feedback systems, computer-based networks, video and audio conferencing, internet websites, and computer-assisted instruction (Ajayi, 2008). Such methods enhance lifelong learning opportunities and are increasingly popular in tertiary institutions for tutoring, course management, simulations, and problem-solving. The growth of e-learning is driven by its suitability for simulation and experiential learning via the Internet and computer applications. The internet offers free, practical exercises applicable in education.

For institutions to adopt e-learning effectively, they must provide adequate and reliable technical infrastructure (Pirani, 2004). E-learning can be defined as sharing and storing knowledge through interaction, updated as needed, and delivered via the internet. E-learning creates an engaging learning environment, allowing students to learn at their own pace and review material as needed. It also enhances teacher-student interaction, fostering conversations and questions. Interactive interfaces and engaging course content significantly increase students' motivation and participation.

E-learning technology is highly sought after by educators for its cost-effectiveness, flexible access, elimination of distance barriers for globally distributed learners, just-in-time training, and support for alternative pedagogies like simulation, experiential learning, interactivity, and self-paced learning. Gold (2001) noted that e-learning technologies are available across all functional areas of education, with the primary limitation being the creativity of teachers in utilizing these tools. The rapid growth in e-learning is driven by high demand and the availability of e-learning products and channels. Okoro (2008) highlighted that students' learning can be significantly enhanced through the use of e-learning technologies. However, the Organization for Economic Co-operation and Development (OECD, 2005) observed that the adoption of e-learning technology has been slow in many educational institutions. According to Nwagbo and Ugwuanyi (2011), the development and utilization of e-learning technologies in developing countries like Nigeria lag behind those in developed countries.

In the 21st century, awareness of available e-learning facilities for effective instruction is crucial. Some teachers may not fully realize the e-learning tools at their disposal, posing a challenge. Previous studies (Okorieocha & Eronini, 2016) have focused on the availability and use of e-learning facilities, primarily at the secondary and primary school levels. The availability and utilization of e-learning facilities in Nigerian secondary schools must be assessed to determine their impact on knowledge delivery. Ngwu (2014) reported that most ICT facilities are not adequately available in schools. This scarcity hinders teachers, even when trained, from effectively using these technologies. Research also reveals a low extent of ICT utilization in schools. E-learning aims to transform traditional curriculum implementation methods to foster behavioral changes in learners. Studies (Owulu, 2016) have found that secondary schools often face issues with the availability, adequacy, or effective utilization of e-learning facilities.

The rapid advancements in information and communication technology have significantly impacted education, shifting it from teacher-centered to student-centered learning, which can occur independently of physical environments. ICT has made teaching and learning more interactive and even virtual. Despite these advancements, several factors hinder the effective utilization of ICT in education across different countries. Mungai (2010) identified obstacles such as a lack of qualified teachers, unreliable electricity, inadequate computers, high procurement costs, computer breakdowns, computer phobia, and increased moral degradation through inappropriate internet use. Langat (2015) pointed out barriers like infrastructure shortages, insufficient teachers, lack of a clear digital curriculum, political factors, poor planning and timing, communication barriers, corruption, and high crime rates.

E-learning creates a more engaging learning environment, allowing students to learn at their own pace and review materials as needed. It enhances teacher-student interactions, facilitating conversations and questions (Ong & Quek, 2023). Interactive interfaces and engaging course content significantly boost students' motivation. For example, China's Rain Classroom, an effective online educational platform, has over 19 million registered users since its inception in 2016 (University of Macau, 2018). In Turkey, the Education Information Network (EBA) supports more than 12 million public school students, integrating technology into education and providing an important alternative for online education during local or global disruptions. While e-learning technology offers numerous benefits and has the potential to revolutionize education, its effective implementation requires overcoming significant challenges, including resource availability, infrastructure, stakeholder awareness, readiness and usability.

Problem Statement

Zamfara State, located in Nigeria's North-Western region, is often classified as an educationally disadvantaged area. The state faces significant challenges in educating its citizens, which hinder the effective implementation of both traditional and e-learning education. Successful teaching and learning require collaboration between teachers and

students to achieve curriculum objectives. However, these goals are often obstructed by the lack of essential facilities for both physical and virtual education.

In the 21st century, education has increasingly adopted a blended approach, a shift accelerated by the Covid-19 pandemic, which necessitated virtual teaching and learning. This transition to virtual education requires the use of e-learning facilities by both teachers and students. Communities in Zamfara State, like many others, struggle with this switch, finding it difficult to fully utilize digital educational tools and resources. This study addresses several crucial questions: Are teachers in Zamfara State aware of e-learning facilities? Are these facilities available? If available, are they accessible and usable? What challenges do teachers face in utilizing them? These questions are the main focus of this research.

Research Questions

The following research questions guided this study:

1. What is the Upper basic and senior school teachers' current level of awareness of e-learning facilities for teaching in three local government areas of Zamfara State?

2. Do upper basic and senior school-teachers in three local government areas of Zamfara State have access to e-learning facilities for their teaching?

3. To what extent do upper basic and senior school-teachers in three local government areas of Zamfara State utilize e-learning facilities in their teaching practices?

4. What challenges do upper basic and senior school-teachers in three local government areas of Zamfara State face in accessing e-learning facilities for their teaching?

Methodology

The research design for this research is descriptive research survey type. The population for the study is all the 14 local government areas of Zamfara State and a purposive sampling procedure was used to select three local government areas. This is in line with the study of Sambo (2008) who maintained that research can purposely if the research finds the population meeting its characteristics. The three local government areas are Bukkuyum, Bungudu and Zurmi. These three local governments constituted the target population. There are 32 upper basic and senior public schools in the three local government areas, out of which 15 were sampled using simple sampling techniques These 15 schools have a total population of 1,531 teachers. Three hundred and six where teachers were sampled in the ratio 183:122 respectively, this was in line with the research advisors (2006).

The instrument used to elicit the data for this study is a Researcher's designed questionnaire with psychometric properties of contents validity and a reliability index of 0.84. The questionnaire is tagged Questionnaire on "Awareness, Availability, Accessibility, Usability and Challenges of E-learning Facilities for Teaching". With 30-items in to three sections to take care of each of the variables of the study.

Self-administration with the help of five research assistants was employed to collect the needed data for the study. A descriptive data analysis procedure was adopted to answer the research questions raised in the study.

Results

The findings of the study were presented in pie charts and table percentages.

Research Question 1: What is the Upper basic and senior school teachers' current level of awareness of e-learning facilities for teaching in three local government areas of Zamfara State?

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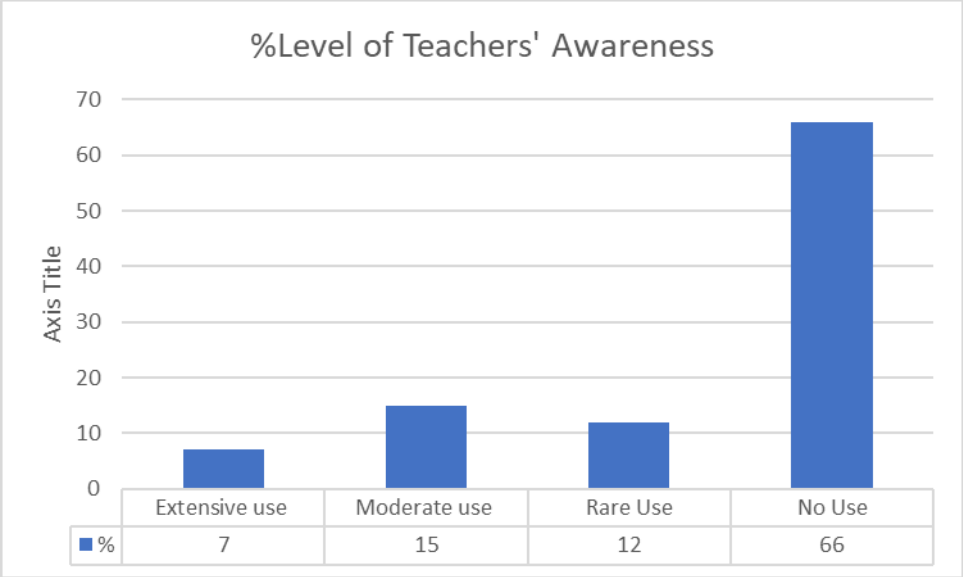

Figure 1: % Level of Teachers' Awareness

Figure 1 shows that most of the 356 teachers in Bukkuyum, Bungudu, and Zurmi are unaware of available e-learning facilities, highlighting a need for increased awareness and training.

Research Question two: How accessible are E-learning facilities to teachers in Bukkuyum, Bungudu and Zurmi, considering factors such as physical availability and connectivity?

Table 1: Percentage table of Accessibility

Accessibility factors	N	VA (%)	A(%)	NA(%)	NAA(%)	Mean	Std.
Physical Availability of Devices	356	40(11)	60 (17)	131 (37)	125 (35)	181.75	58.13
Internet Connectivity	356	32 (9)	68 (19)	140 (39)	116 (33)	182	76.07
Technical Support	356	35 (10)	80 (22)	132 (37)	109 (31)	188.25	75.33
Electricity Supply	356	30 (8)	64 (18)	136 (38)	126 36	177.50	70.94
Affordability of E-learning Tools	356	42 (12)	83 (23)	131(37)	100 (28)	194.75	75.63
Digital Literacy	356	43 (12)	88(25)	118(33)	103929)	193.75	71.71

Table 1 shows that over half of respondents find e-learning facilities inaccessible due to issues like internet connectivity, technical support, electricity, affordability, and digital literacy.

Research Question three: To what extent do teachers in Bukkuyum, Bungudu and Zurmi utilize E-learning facilities in their teaching practices?

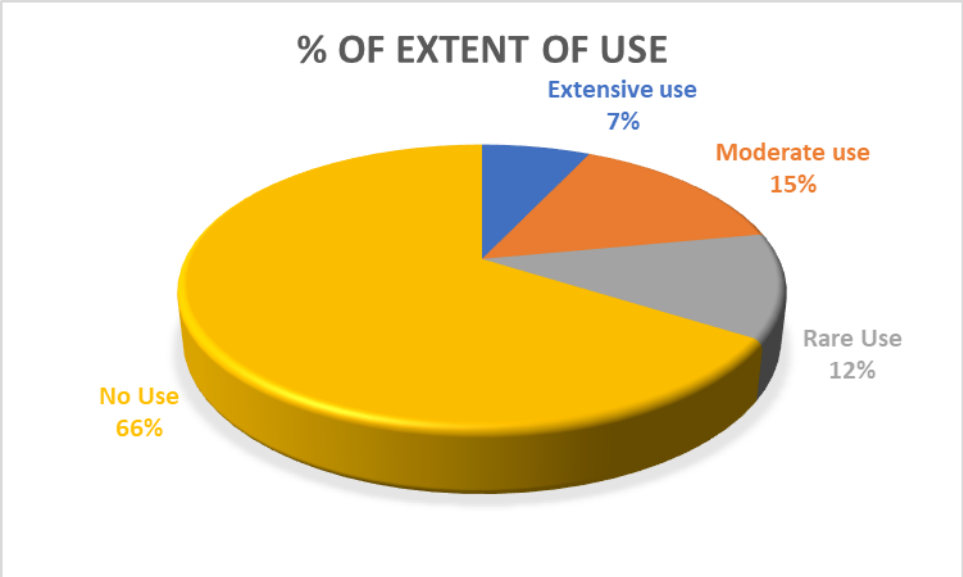

Figure 2: extent of use of E-learning facilities

The pie chart shows that most teachers in Bukkuyum, Bungudu, and Zurmi do not use e-learning facilities, with only a few making extensive or moderate use.

Research question four: What are the main challenges faced by teachers in Bukkuyum, Bungudu and Zurmi in accessing E-learning facilities for their teaching activities?

Table 2: Percentage table of challenges

Challenges	N	Freq. of Agree	%	Freq of Disagree	%
Frequently face issues with unreliable or	356	290	82%	66	18%

unavailable internet connectivity when trying to use e-learning facilities.					
Inconsistent electricity supply is a significant barrier to my use of e-learning facilities.	356	275	77%	81	23%
There is insufficient technical support available to help me with e-learning tools and resources.	356	265	74%	91	26%
The cost of necessary e-learning tools and devices is a major obstacle for me.	356	280	78%	76	22%
My lack of digital literacy skills hinders my ability to effectively use e-learning facilities.	356	245	69%	111	31%
There are not enough e-learning resources available for my teaching needs.	356	260	73%	96	27%
I receive adequate support from the school administration in using e-learning facilities.	356	186	52%	170	48%
There are sufficient training opportunities available to help me improve my e-learning skills.	356	180	51%	176	49%
My students have difficulty engaging with e-learning activities due to their own lack of access or skills.	356	285	80%	71	20%
The current curriculum does not integrate e-learning effectively, making it challenging to use these facilities.	356	270	76%	86	24%

The table highlights that teacher in the three sampled LGAs of Zamfara State struggle with major challenges such as unreliable internet, inconsistent electricity, insufficient technical support, high costs, and inadequate digital literacy, hindering effective e-learning implementation.

Research Question five: What support mechanisms (training, resources, technical assistance) are provided to teachers in the three sampled LGA to enhance their use of E-learning facilities?

Table 3: Percentage of Support Mechanism

Support Mechanisims for Teachers	N	Availability	Effectiveness
Workshops and professional development courses on using E-learning tools	356	26%	25%
Provision of digital devices (computers, tablets) and internet access	356	2%	--%
On-site and remote technical support for troubleshooting and software use	356	--%	--%
Collaboration and sharing of best practices among teachers	356	2%	--%
Access to digital libraries and online teaching materials	356	--%	--%
Rewards and recognition for integrating E-learning into teaching practices	356	4%	--0%
Availability of reliable electricity and modern classroom technology	356	--%	--%

The table shows that support mechanisms for teachers in the three LGAs are largely ineffective. Workshops and professional development courses have 26% availability and 25% effectiveness, while digital devices, technical support, and collaboration efforts are almost nonexistent. Rewards for integrating e-learning and reliable electricity are also insufficient.

Discussion

The study revealed a significant lack of awareness among teachers in Bukkuyum, Bungudu, and Zurmi about available e-learning facilities, highlighting the critical need for increased awareness and training initiatives. This is supported by Abdullahi et al. (2022), who noted common awareness gaps in rural Nigerian communities due to limited exposure to digital technologies and educational resources. Alhassan and Soykan (2022) also emphasize targeted awareness campaigns and training programs to address these knowledge gaps among educators, advocating for workshops, seminars, and digital literacy initiatives to empower teachers in utilizing e-learning tools effectively and preparing students for a digital-driven future.

Additionally, the study underscored the shortfall in the availability of e-learning facilities for teachers in these areas, pointing to substantial challenges in accessing essential digital resources needed for effective teaching and learning. Abdullahi et al. (2022) highlight the lack of adequate infrastructure in rural Nigeria to support widespread e-learning initiatives, including access to computers, tablets, and reliable internet connectivity. This infrastructure deficit directly contributes to the limited availability of e-learning facilities observed in the study, echoing broader research on educational disparities in developing regions (Edeh, 2023).

The extent of e-learning facility use among secondary school teachers in Zamfara State was also examined, focusing on awareness, access, usability, and challenges. Research indicates varying degrees of e-learning adoption are influenced by factors such as infrastructure, training, and institutional support (Gikandi et al., 2011; Ally, 2020; Ong & Lai, 2019; Jung & Latchem, 2022).

Moreover, the study found profound challenges hindering the effective adoption and usage of digital resources among teachers, including unreliable internet connectivity, inconsistent electricity supply, insufficient technical support, and limited institutional support. These issues underscore the critical need for infrastructure development, resource allocation, and policy support to improve e-learning experiences and create a conducive digital learning environment in Zamfara State.

Addressing these challenges requires a coordinated effort to enhance infrastructure, technical and administrative support, digital literacy among teachers, and access to comprehensive e-learning resources. By investing in these areas, Zamfara State can foster a robust e-learning ecosystem in secondary education, ultimately enhancing educational quality and accessibility in the region and preparing students for a digital future.

Conclusion

Addressing Zamfara State's e-learning challenges demands targeted efforts to enhance infrastructure, digital literacy among teachers, and institutional support. Investments in internet access, digital devices, and technical assistance are crucial. Equally vital are comprehensive training programs to empower educators in utilizing e-learning effectively. Recognizing and rewarding innovation in digital education can further motivate teachers. These initiatives aim to create a supportive environment that fosters educational advancement and prepares students for a digital future, ensuring equitable access to quality education across the region.

Recommendations

Based on this, the following recommendations were made:

i. Raise teacher's awareness of the existence of different e-learning facilities available for teaching.

ii. Provide upper basic and senior school-teachers in three local government areas of Zamfara State with adequate access to e-learning facilities for their teaching.

iii. Provide upper basic and senior school-teachers in three local government areas of Zamfara State with adequate training to be able to utilize the e-learning facilities required for teaching.

iv. Expand internet infrastructure to improve connectivity for e-learning.

v. Zamfara State should try to implement mandatory digital literacy training for teachers to enhance their professional development.

vi. Establish a dedicated technical support system for e-learning tools in public schools in the local government and across the state generally.

vii. Enhance administrative support and funding for e-learning initiatives.

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