

THE ROLE OF E-LEARNING IN EXPANDING ACCESS TO EDUCATION IN COLLEGES OF EDUCATION IN ANAMBRA STATE

Adaobi Jennifer Iloakasia

Department of Educational Psychology Guidance and Counselling
Nwafor Orizu College of Education, Nsugbe Anambra State, Nigeria
jenniferadaobiiloakasia@gmail.com

Abstract

Access to quality education remains a fundamental pillar for national development and individual empowerment. In recent years, the integration of technology into the education sector has transformed how learning is delivered and received, with e-learning emerging as a key tool in bridging educational gaps. The aim of this study was to examine how digital learning platforms have contributed to improving educational opportunities across Anambra State. The study was guided by 3 research questions and 3 research objectives. A descriptive survey design was implemented and participants included students, teachers, and school administrators from selected tertiary institutions. A total of 300 respondents were chosen through a multi-stage sampling method. Data were gathered using a well-structured and validated questionnaire titled the E-learning and Access to Education Questionnaire (EAEQ), which proved reliable with a Cronbach's Alpha of 0.96. Questionnaires were shared online. The responses were analyzed using simple descriptive statistics (means, and standard deviations) and inferential statistics (ANOVA) was deployed for hypotheses testing. The findings revealed that students in Anambra State utilize a range of e-learning platforms such as WhatsApp, Zoom, Google Classroom, and Microsoft Teams, with these tools generally enjoying widespread and consistent use. Others like Coursera, YouTube EDU, and Telegram channels are used less frequently and show more variation in engagement. E-learning is recognized for expanding access to education by overcoming geographic limitations, offering flexibility, and supporting continuous learning during disruptions. However, challenges persist, including poor internet connectivity, high data costs, limited digital skills, and unreliable power supply. Statistical analyses confirm that gender and level of study significantly influence the usage, perceived benefits, and challenges of e-learning. The study recommends that government and educational stakeholders invest in ICT infrastructure, promote digital literacy, and develop supportive policies to ensure the effective and equitable implementation of e-learning across Anambra State.

Keywords: E-learning, Access to Education, Digital Learning, ICT, Education

Introduction

E-learning has emerged as a transformative tool in the field of education, significantly enhancing access to learning opportunities beyond the limitations of traditional classroom settings. E-learning, or electronic learning, refers to the use of digital technologies and internet-based tools to deliver educational content and facilitate teaching and learning outside traditional classroom settings (Ukpe, 2023). It encompasses various formats such as online courses, virtual classrooms, webinars, and multimedia resources that allow learners to access information anytime and anywhere. E-learning supports flexibility, personalized learning, and interaction through platforms like Learning Management Systems (LMS). In contexts with limited educational infrastructure, such as Nigeria, e-learning provides an alternative pathway for acquiring knowledge and skills, especially for individuals in remote areas or with other learning constraints (Okekeuche, 2024). In Nigeria, where educational infrastructure challenges and a growing population place immense pressure on existing systems, e-learning presents a practical alternative to bridge the access gap. The growing integration of digital platforms into teaching and learning processes has not only democratized education but has also introduced flexibility and inclusivity across various levels of education.

According to Sobaih et al (2021), e-learning has broadened the access to education by enabling learners from remote and underserved areas to access quality instructional materials through internet-based platforms. Access to education means the ability of individuals to obtain and participate in quality learning opportunities without barriers such as geography, socioeconomic status, gender, disability, or conflict. It encompasses not only physical availability of schools but also the affordability, inclusiveness, and cultural relevance of education. In Nigeria and other developing countries, access is often hindered by inadequate infrastructure, poor funding, and social inequalities. True access ensures that all individuals, regardless of

background, have the right and means to pursue education and develop their potential fully, contributing meaningfully to society (Nguyen, 2022). This flexibility addresses the infrastructural deficits that often hinder access to education, especially in rural areas. Similarly, Cao et al (2023) argue that e-learning has expanded educational reach by overcoming the geographical barriers that prevent learners from attending conventional schools due to long distances or lack of transportation.

Furthermore, the COVID-19 pandemic underscored the importance of e-learning in maintaining educational continuity. The nationwide lockdown led many Nigerian institutions to adopt virtual learning platforms such as Google Classroom, Zoom, and Moodle to sustain academic activities (Edwards-Fapohunda, 2024). This sudden shift demonstrated the potential of e-learning to sustain academic programs during crises and further emphasized its role in ensuring uninterrupted education. E-learning also plays a critical role in lifelong learning and continuing education. According to Saqr et al (2024), e-learning platforms support non-traditional learners such as working adults, mothers, and those with disabilities by offering them the flexibility to learn at their own pace and convenience. This inclusivity promotes educational equity by accommodating different categories of learners who might otherwise be excluded from formal education systems.

Despite its potential, several challenges hinder the full realization of e-learning's promise in Nigeria. Poor internet connectivity, unreliable power supply, and limited access to digital devices remain significant obstacles (Nja et al, 2024). Additionally, many educators and students lack the necessary digital literacy skills to effectively navigate online learning environments. These barriers disproportionately affect learners from rural and low-income backgrounds, thereby perpetuating existing inequalities. Nevertheless, the Nigerian government and educational stakeholders have shown increasing interest in integrating ICT into the educational system. Policies such as the National Policy on Information and Communication Technology in

Education have emphasized the need for digital competence and the adoption of e-learning platforms across all educational levels (Federal Ministry of Education, 2021). These efforts, though commendable, require consistent implementation, investment in infrastructure, and capacity building among educators and learners.

Education in Anambra State plays a vital role in shaping the region's socio-economic development. Known for its high literacy rates and strong academic culture, the state has invested significantly in improving access, infrastructure, and teaching quality across all levels of education. From primary to tertiary institutions, Anambra boasts a network of schools committed to academic excellence. However, disparities in access and technological readiness persist, especially at the tertiary level. This study focuses specifically on students in Colleges of Education, examining how e-learning is being used to expand access to learning opportunities and overcome traditional barriers within the educational system. A synthesis of the literature reveals a consensus that while e-learning has significantly expanded access to education in Nigeria, its impact is contingent upon addressing systemic challenges. For instance, Adeoye (2025) highlight the importance of training programs for teachers to develop competencies in e-teaching methodologies.

Moreover, strategic partnerships with private technology firms could facilitate the provision of affordable internet and devices to underserved communities. E-learning also supports student-centered learning approaches. According to Akhigbe and Ogunlade (2022), digital platforms promote self-paced learning, interactive engagement, and personalized instruction, which are vital for improving learning outcomes. These pedagogical shifts foster a more engaging learning experience that traditional methods often lack, particularly in overcrowded classrooms. E-learning is playing a growing role in how students access education, especially in Anambra State where many still face barriers to traditional schooling. As digital tools become more common in learning, it's important to understand which e-learning resources students

use, how these tools help improve access to education, and what obstacles schools and learners face. This study focuses on these key issues to highlight areas that need attention. The goal is to support better planning, create more inclusive learning environments, and ensure that students across the state have fair and equal opportunities to learn, no matter their circumstances.

Research Objectives

1. To identify the types of e-learning resources commonly used by students in Colleges of Education in Anambra State.
2. To examine the extent to which e-learning enhances access to education for students in Colleges of Education in Anambra State.
3. To explore the major challenges faced by students in the implementation and use of e-learning platforms in Colleges of Education in Anambra State.

Research Questions

1. What are the available e-learning resources utilized by students in Colleges of Education in Anambra State?
2. What role does e-learning play in expanding access to education in Colleges of Education in Anambra State?
3. What are the challenges associated with the implementation of e-learning in Colleges of Education in educational institutions within Anambra State?

Hypotheses

1. There is no significant difference in the extent to which e-learning resources are utilized by students across gender and level of study in Colleges of Education in Anambra State.
2. E-learning does not play a significant role in expanding access to education among students across gender and level of study in Colleges of Education in Anambra State.

3. There are no significant differences in the challenges associated with the implementation of e-learning across gender and level of study in Colleges of Education in Anambra State.

Method

The study adopted a descriptive survey design to examine how e-learning expands access to education in Colleges of Education in Anambra State. This design allowed for the systematic collection of data from a large number of respondents without manipulating variables. The research was carried out in Anambra State, Nigeria, specifically focusing on Colleges of Education offering educational training and actively integrating e-learning practices. The target population consisted of students enrolled in Colleges of Education in Anambra State who have been exposed to e-learning tools and platforms as part of their learning experience. A total of 300 students were selected using a multi-stage sampling technique. This approach ensured the inclusion of students from different departments and levels across various colleges in the state.

Data were collected using a structured and validated instrument titled the E-learning and Access to Education Questionnaire (EAEQ). The questionnaire was designed to capture students' experiences, perceptions, and challenges related to e-learning. The instrument was reviewed and validated by experts in educational research and measurement to ensure its clarity, content coverage, and appropriateness for the target population. The instrument was subjected to a pilot test. Data from the pilot were analyzed using Cronbach's Alpha, and the reliability coefficient obtained was 0.96, which indicates excellent internal consistency, affirming the instrument's reliability for the main study. The questionnaire was administered online, making it accessible to the selected students across the different institutions. Clear instructions and assurances of confidentiality were provided. Responses were analyzed using descriptive statistics such as means and standard deviations to answer the research

questions. In addition, Analysis of Variance (ANOVA) was used to test hypotheses at the 0.05 level of significance.

Results

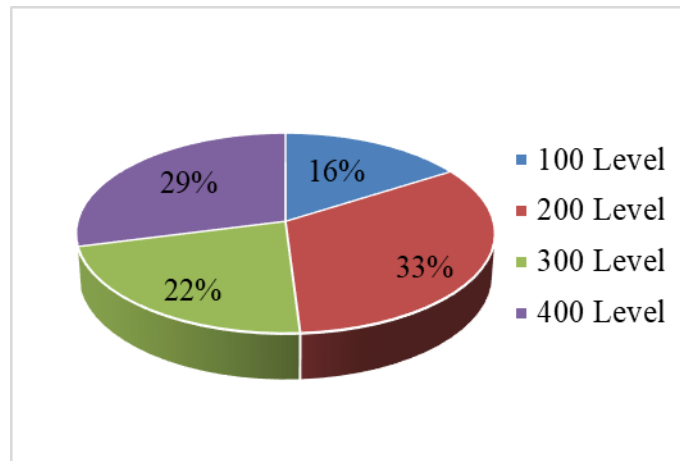


Figure 1: Demographic information of the respondents based on their *Level of Study*

Figure 1 shows the respondents' distribution by level of study. Most were at the 200 Level (33%), followed by 400 Level (29%), 300 Level (22%), and 100 Level (16%). This indicates that higher-level students (300–400 Level: 51%) made up over half of the participants.

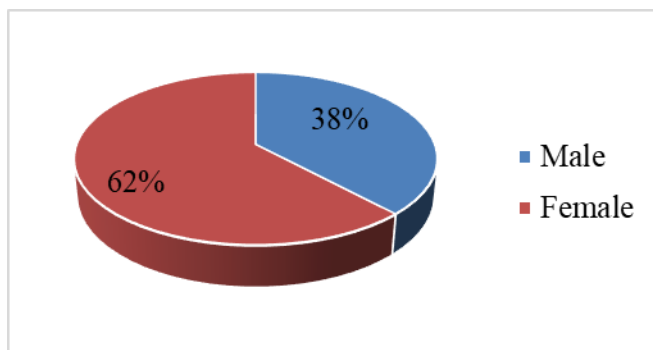


Figure 2: Demographic information of the respondents based on their *Gender*

Figure 2 illustrates the gender distribution of respondents. A higher proportion were female (62%), while males accounted for a smaller share (38%). This suggests that female participants were more actively represented in the study, making up nearly two-thirds of the total respondent population.

Research Question One: What are the available e-learning resources utilized by students in Anambra State?

<https://joredea.fontisaidfoundation.com>

Table 1: Descriptive statistics showing the various e-learning resources utilized by students in Anambra State in response to Research Question 1.

	Mean	Std. Deviation	Variance	Skewness	Std. Error of Skewness	Kurtosis
WhatsApp utilized informally for sharing notes	3.39	0.594	0.352	-0.388	0.141	-0.682
Google Classroom helps manage lectures, tasks, submissions.	3.3	0.716	0.513	-0.522	0.141	-0.919
Zoom enables virtual classes, presentations.	3.32	0.551	0.304	-0.018	0.141	-0.653
Microsoft Teams delivers academic content, announcements.	3.14	0.716	0.513	-0.208	0.141	-1.033
Coursera provides online degrees, video courses	2.75	1.156	1.337	-0.461	0.141	-1.239
Telegram channels circulate notes, updates	2.85	1.127	1.269	-0.64	0.141	-0.978
YouTube EDU hosts academic tutorials	2.81	1.232	1.517	-0.516	0.141	-1.359

Table 1 presents the descriptive statistics of e-learning resources used by students in Anambra State. WhatsApp had the highest utilization (Mean = 3.39, SD = 0.594), suggesting it is a commonly used informal platform for academic interactions. Zoom (M = 3.32, SD = 0.551), Google Classroom (M = 3.30, SD = 0.716), and Microsoft Teams (M = 3.14, SD = 0.716) followed closely, all showing relatively low standard deviations, which indicate consistent usage patterns. In contrast, Coursera (M = 2.75, SD = 1.156), Telegram (M = 2.85, SD = 1.127), and YouTube EDU (M = 2.81, SD = 1.232) had lower means and higher standard deviations, reflecting less frequent but more varied usage. The negative skewness across all items suggests a general leaning toward higher usage ratings.

Research Question Two: What role does e-learning play in expanding access to education in Anambra State?

Table 2: Descriptive statistics highlighting students' responses to the role of e-learning in expanding access to education in Anambra State, based on Research Question 2.

	Mean	Std. Deviation	Variance	Skewness	Std. Error of Skewness	Kurtosis
E-learning removes geographical barriers, allowing education in remote communities.	3.44	.600	.361	-.547	.141	-.609
Students access quality materials anytime, using phones, laptops, digital devices.	3.23	.868	.753	-1.175	.141	.909
Online platforms support continuous learning during strikes, crises, or emergencies.	3.13	1.138	1.295	-1.018	.141	-.482
Flexible schedules enable workers, parents, learners to study without interruption.	3.55	.601	.362	-.996	.141	-.014
Learners choose personalized paths, mastering topics at comfortable individual pace.	2.99	1.202	1.445	-.499	.141	-1.472
Recorded lessons help students review difficult topics multiple times independently.	3.63	.589	.347	-1.372	.141	.857
E-learning supports inclusive education for students with mobility-related challenges.	2.81	1.322	1.746	-.495	.141	-1.547

Table 2 presents descriptive statistics on students' perceptions of how e-learning expands access to education in Anambra State. The highest-rated factor was the ability to review recorded lessons independently (Mean = 3.63, SD = 0.589), followed by flexible schedules for diverse learners (M = 3.55, SD = 0.601) and the removal of geographical barriers (M = 3.44, SD = 0.600). These items also showed low standard deviations, indicating consistent agreement among respondents. Moderate ratings were recorded for access to quality materials (M = 3.23, SD = 0.868) and learning continuity during crises (M = 3.13, SD = 1.138), showing slightly more varied views. Personalized learning (M = 2.99, SD = 1.202) and inclusive education for mobility-challenged students (M = 2.81, SD = 1.322) had the lowest means and highest standard deviations, suggesting more diverse student responses. The

<https://joredea.fontisaidfoundation.com>

consistent negative skewness across items reflects a general tendency toward agreement.

Research Question Three: What are the challenges associated with the implementation of e-learning in educational institutions within Anambra State?

Table 3: Descriptive statistics detailing the challenges faced in implementing e-learning across educational institutions in Anambra State in response to Research Question 3.

	Mean	Std. Deviation	Variance	Skewness	Std. Error of Skewness	Kurtosis
Poor internet connectivity disrupts smooth delivery of online academic activities.	3.40	.596	.355	-.432	.141	-.670
Limited access to devices affects students in rural underserved areas.	3.23	.541	.293	.102	.141	-.253
Inadequate digital skills hinder effective use of e-learning platforms.	3.18	1.070	1.145	-1.140	.141	-.042
High data costs discourage frequent participation in virtual learning sessions.	3.36	.909	.826	-1.420	.141	1.131
Power supply issues interrupt online classes across many Nigerian institutions.	3.20	1.174	1.378	-1.119	.141	-.423
Inconsistent platform functionality frustrates users during peak academic periods.	3.61	.594	.352	-1.254	.141	.551
Technical support remains unavailable in most remote learning environments.	2.99	1.202	1.445	-.499	.141	-1.472

Table 3 highlights the major challenges students face in implementing e-learning across educational institutions in Anambra State. The most prominent issue was inconsistent platform functionality (Mean = 3.61, SD = 0.594), indicating widespread frustration during peak academic periods. Poor internet connectivity (M = 3.40, SD = 0.596) and high data costs (M = 3.36, SD = 0.909) were also rated highly, reflecting infrastructural and financial barriers. Inadequate digital skills (M = 3.18) and erratic power supply (M = 3.20) further hinder effective adoption, with relatively high standard deviations indicating varied experiences. Limited device access (M =

3.23, SD = 0.541) had the lowest variance (0.293), suggesting strong agreement, particularly in underserved areas. The lowest-rated challenge was the unavailability of technical support (M = 2.99, SD = 1.202), though its high variance points to a range of differing experiences.

Hypothesis One: There is no significant difference in the extent to which e-learning resources are utilized by students across gender and level of study in Anambra State.

Table 4: ANOVA table on difference in which e-learning resources are utilized by students across gender and level of study in Anambra State

		Sum of				
Model		Squares	df	Mean Square	F	Sig.
1	Regression	507.532	1	507.532	56.685	.000 ^b
	Residual	2668.135	298	8.953		
	Total	3175.667	299			
2	Regression	700.289	2	350.144	42.011	.000 ^c
	Residual	2475.378	297	8.335		
	Total	3175.667	299			

The ANOVA results in Table 4 test whether gender and level of study significantly influence students' utilization of e-learning resources in Anambra State. In Model 1 (Gender only), the F-value is (56.685) with a significance level of ($p = .000$), while Model 2 (Gender and Level of Study) shows an F-value of (42.011) and also a significance level of ($p = .000$). Since both p-values are less than (0.05), the null hypothesis is rejected. Therefore, gender and level of study significantly affect how students utilize e-learning resources.

Hypothesis Two: E-learning does not play a significant role in expanding access to education among students across gender and level of study in Anambra State.

Table 5: ANOVA table on role of E-learning in expanding access to education among students across gender and level of study in Anambra State

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1146.775	1	1146.775	67.535	.000 ^b
	Residual	5060.141	298	16.980		
	Total	6206.917	299			
2	Regression	1269.271	2	634.635	38.173	.000 ^c
	Residual	4937.646	297	16.625		
	Total	6206.917	299			

The ANOVA results in Table 4 show a significant effect of gender and level of study on the perceived role of e-learning in expanding access to education in Anambra State ($F(2, 297) = 38.173, p = .000$). The significance level is below 0.05, indicating a statistically significant model. The inclusion of both gender and level of study increased the explained variance compared to gender alone. Therefore, the null hypothesis is rejected, confirming that e-learning significantly expands educational access across gender and study levels.

Hypothesis Three: There are no significant differences in the challenges associated with the implementation of e-learning across gender and level of study in educational institutions within Anambra State.

Table 6: ANOVA table on differences in the challenges associated with the implementation of e-learning across gender and level of study in educational institutions within Anambra State

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	612.733	1	612.733	31.357	.000 ^b
	Residual	5823.147	298	19.541		
	Total	6435.880	299			
2	Regression	976.736	2	488.368	26.569	.000 ^c
	Residual	5459.144	297	18.381		
	Total	6435.880	299			

The ANOVA output in Table 4 reveals significant differences in the challenges of implementing e-learning across gender and level of study in Anambra State ($F(2, 297) = 26.569, p = .000$). The p-value is less than 0.05, indicating the model is statistically significant. Adding gender to the model with level of study increased the explanatory power. Thus, the null hypothesis is rejected, showing that challenges in e-learning implementation differ significantly by gender and level of study in educational institutions.

Discussions

Research Question 1 ascertained the available e-learning resources utilized by students in Anambra State. the result showed that students in Anambra State now have access to a variety of e-learning platforms that support both formal and informal academic learning. WhatsApp, for example, is widely used for managing online

<https://joredea.fontisaidfoundation.com>

quizzes, assignments, and feedback. This aligns with what Lakmali et al (2021) found—they observed that WhatsApp helped maintain informal academic delivery in many tertiary institutions. In contrast, Google Classroom is seen as more user-friendly, especially for managing schedules and classroom communication, which Okekeuche (2024) noted in their study on digital platforms in Nigerian universities. Zoom, on the other hand, became the go-to platform during lockdowns for live classes and discussions. This finding agreed with Gertz (2022), who noted how Zoom kept learning alive during crises. Microsoft Teams also plays a similar role but is often preferred in institutions already using Microsoft's ecosystem (Sobaih et al, 2021). In a related study, Coursera was shown to provide flexible learning options and certifications, especially for students looking to build global-standard skills (Nguyen, 2022). Some students also turn to Telegram channels to share updates, lecture notes, and videos. While less formal, this method is widely used, especially when institutional platforms are down. YouTube EDU also supports independent learning, as it is particularly useful for visual demonstrations and tutorial videos. The hypothesis is rejected, as both gender and level of study significantly influence how students in Anambra State utilize e-learning resources ($p = .000$). However, partial regression plots reveal weak individual relationships for both variables. This suggests that although statistically significant, neither gender nor level of study alone strongly predicts the extent of e-learning resource utilization.

Research Question 2 examined the role that e-learning play in expanding access to education in Anambra State. it was discovered that E-learning is making education more inclusive and accessible across the state. It eliminates the need for physical presence, which is a huge plus for students in remote areas. Cao et al, (2023) noted that students in rural areas could now access the same learning materials as those in cities. Unlike traditional schooling, where fixed schedules are the norm, e-learning offers flexibility. Workers, parents, and other adult learners benefit from this, as

Edwards-Fapohunda (2024) found in their study. Also, during strike actions or public health crises, learning doesn't have to stop. Platforms like Coursera and Google Classroom kept students engaged during the ASUU strike, as confirmed by Saqr, et al, (2024). Another key point is that students can now learn at their own pace, revisiting difficult topics using recorded videos and digital materials. Nja et al, (2024) emphasized that this kind of personalized learning boosts comprehension and confidence. Furthermore, e-learning provides opportunities for students with physical disabilities to learn without the limitations of mobility. This agrees with Adeoye (2025), who highlighted how accessible design features supported inclusive education in Nigerian institutions. E-learning significantly expands access to education across gender and level of study, as shown by the ANOVA result ($p = .000$). While gender and study level jointly affect perceptions, partial regression plots suggest each has a weak individual influence. Nonetheless, the overall model indicates that students view e-learning as a meaningful tool for improving educational access in Anambra State.

Research Question 3 covered the challenges associated with the implementation of e-learning in educational institutions within Anambra State. The result showed that despite the benefits, students still face several hurdles. One major issue is poor internet connectivity. In a related study, Akhigbe and Ogunlade (2022) reported that unstable internet made it difficult for students to attend or complete virtual sessions. In contrast, students in urban areas had better connectivity experiences. Another challenge is limited access to digital devices. Digital skills are also lacking. Many students struggle to use some of the platforms effectively. Ajibade et al, (2022) stressed the importance of training and orientation for both students and lecturers. High data costs are a consistent complaint. Ebohon et al, (2021) observed that students were discouraged from participating in long virtual classes because of how much data they consumed. Power supply issues further complicate things—

frequent blackouts disrupt online sessions, especially in public institutions. Finally, the lack of technical support means students and lecturers often have to troubleshoot problems on their own, which Marsevani, (2022) noted as a significant barrier. Significant differences exist in the challenges of implementing e-learning across gender and level of study ($p = .000$), leading to the rejection of the null hypothesis. Gender shows a stronger predictive influence than level of study, as observed in the partial regression plots. This suggests e-learning implementation challenges are more concentrated around gender-related experiences than educational level.

Conclusion

The findings of this study affirm the critical role of e-learning in broadening access to education in Anambra State. E-learning has created alternative learning pathways for students, allowing them to engage with educational content beyond the physical limitations of the classroom. This has proven especially valuable for students in remote or underserved communities, where traditional schooling may be disrupted or difficult to access. With the use of digital platforms, students and educators have maintained continuous and interactive learning experiences that promote flexibility and accommodate varying schedules and learning preferences. Despite these benefits, the study also reveals a number of pressing challenges that continue to undermine the effective implementation of e-learning. Among the most significant are limited digital literacy among both students and teachers, poor internet connectivity, high data costs, unreliable electricity, and insufficient access to technological devices such as smartphones and computers. These challenges not only restrict participation but also widen the digital divide, particularly between urban and rural students.

To address these challenges and ensure the sustainability of e-learning in Anambra State, several recommendations are necessary. First, there is an urgent need for improved digital infrastructure, especially in rural areas, where internet access and electricity remain unreliable. Government and educational stakeholders must also

<https://joredea.fontisaidfoundation.com>

prioritize digital literacy by incorporating ICT training into the curriculum and offering regular capacity-building workshops for both students and teachers. Furthermore, strategies such as providing device subsidies or learning grants for low-income students can help bridge the accessibility gap. Technical support systems should also be strengthened, and reliable e-learning platforms should be maintained in collaboration with private sector partners. Lastly, inclusive education policies must be enacted to guarantee that all learners, regardless of location or socioeconomic status, have equitable access to digital education.

References

- Adeoye, A. A. (2025). *Towards the Improvement of the Inclusion of Secondary School Students with Special Educational Needs/Disabilities (SEN/D) in Nigeria: A Case Study of an Inclusive Public and Private Secondary School in Lagos State* (Doctoral dissertation, University of East London).
- Ajibade, Y. A., Adeleke, M. A., & Oyetoro, O. S. (2022). Relevance of the pedagogical training programme for lecturers and its challenges in Obafemi Awolowo University, Ile-Ife, Nigeria. *Journal of Curriculum and Instruction*, 14(1), 60-80.
- Akhigbe, O. J., & Ogunlade, B. O. (2022). Online instruction: Panacea to insecurity in Nigerian Tertiary Institutions. *Nigerian Online Journal of Educational Sciences and Technology*, 4(1), 46-56.
- Cao, X., Ji, S., & Liu, X. (2023). Educational inequity and skill formation differences experienced by floating rural students in the process of urbanization: a case study from a school perspective. *Education Sciences*, 13(2), 131.
- Ebohon, O., Obienue, A. C., Irabor, F., Amadin, F. I., & Omoregie, E. S. (2021). Evaluating the impact of COVID-19 pandemic lockdown on education in Nigeria: Insights from teachers and students on virtual/online learning. *Bulletin of the National Research Centre*, 45, 1-11.

- Edwards-Fapohunda, D. M. O. (2024). The role of adult learning and education in community development: A case study of New York. *Iconic Research And Engineering Journals*, 8(1), 437-454.
- Gertz, N. (2022). Zooming through a crisis. *International Journal of Technoethics (IJT)*, 13(1), 1-10.
- Irielle, C. (2024). *An Exploration of the Experiences of Nigerian Adult Learners Utilizing Smartphones and Associated Apps to Access Learning* (Doctoral dissertation, Capella University).
- Lakmali, A. A. I., Abeysekera, N., & Silva, D. S. (2021). Effectiveness of customer social participation for academic purposes: a case of informal WhatsApp groups. *Asian Association of Open Universities Journal*, 16(3), 326-343.
- Marsevani, M. (2022). The challenges of e-learning for higher education lecturers and learners. *Journal of Education Technology*, 6(3), 467-477.
- Nguyen, L. Q. (2022, December). Learners' satisfaction of courses on Coursera as a massive open online course platform: A case study. In *Frontiers in Education* (Vol. 7, p. 1086170). Frontiers Media SA.
- Nja, C. O., Uwe, U. E., & Nkereuwem, V. I. (2024). Artificial Intelligence Tools of Personalized Learning and Intelligent Tutoring System as Correlates of Students Motivation in Chemistry. *African Journal of Science, Technology and Mathematics Education*, 10 (1), 27-32.
- Okekeuche, C. E. (2024). The Role of Digital Technologies in Enhancing Research and Innovation in Nigerian Universities. *Journal of Education in Developing Areas*, 32(2), 251-262.
- Saqr, R. R., Al-Somali, S. A., & Sarhan, M. Y. (2024). Exploring the acceptance and user satisfaction of AI-driven e-learning platforms (Blackboard, Moodle, Edmodo, Coursera and edX): an integrated technology model. *Sustainability*, 16(1), 204.

- Sobaih, A. E. E., Salem, A. E., Hasanein, A. M., & Elnasr, A. E. A. (2021). Responses to Covid-19 in higher education: Students' learning experience using microsoft teams versus social network sites. *Sustainability*, 13(18), 10-36.
- Ukpe, E. (2023). Information and communication technologies (ICTS) for E-Learning in tertiary education. *Open Journal of Social Sciences*, 11(12), 666-680.