

PRINCIPALS' PERCEIVED BARRIERS TO INTEGRATION OF TECHNOLOGY IN TEACHING AND LEARNING PROCESS ENUGU EDUCATION ZONE, ENUGU STATE, NIGERIA OF SECONDARY SCHOOLS IN ENUGU

Ajenefe Juliet Elona

Department of Educational Management, Faculty of Education
Enugu State University of Science and Technology (ESUT), Agbani

Abstract

This study examined the principals' perceived barriers to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone, Enugu State. Three specific purposes, three research questions and three hypotheses guided the study. Descriptive survey research design was used for the study. Population consisted 33 (21 urban and 12 rural) principals in secondary schools in Enugu Education Zone. Census sampling technique was adopted for this study because the population was adequate. Validated questionnaire titled "Integration of Technology in Teaching and Learning Process Questionnaire (ITTLPQ)" was used as the instrument for data collection. The researcher visited all the schools to administer the questionnaire directly to the principals with the help of three research assistants. Data collected on research questions relating to the study were analyzed using mean, standard deviation and t-test. The findings showed that poor infrastructure, insufficient technical skills among instructors, and cultural opposition all hamper development towards a more technologically advanced educational environment. The lack of essential amenities such as computers, internet access, and other technical resources emphasizes the critical need for investment and growth. Similarly, instructors' lack of confidence and competency with technology demonstrates a compelling need for specialized professional development. Finally, cultural attitudes that undervalue technology integration point to a need for community participation and awareness-raising activities. The study recommended that local and federal governments, as well as private-sector partnerships, should invest in improving secondary school technology infrastructure among others.

Keywords: Technology, Teaching and Learning, and Principals in Secondary Schools

Introduction

Education in Nigeria has changed dramatically, from indigenous oral techniques to formal education systems brought by missionaries in the nineteenth century and later colonial forces. Following independence, there were several educational changes aimed at enhancing accessibility and quality, notably the implementation of Universal Basic Education in 2004. According to the Federal Ministry of Education (2023), access to education has improved dramatically following the passage of the Universal Basic Education (UBE) Act in 2004, which requires free education from elementary to junior secondary levels. Aderinoye (2021), stated that Secondary Education in Nigeria attempts to provide a balanced education that prepares students to continue their studies or enter the workforce, with an emphasis on both academic and vocational training. In support to this assertion, Afolabi (2023), opined that the major goals of secondary education in Nigeria are to provide students with the skills they need to live productive lives and to prepare them for higher education options. Furthermore, Secondary Education attempts to instill moral and cultural values while also promoting social integration and community building in Nigeria, Enugu State inclusive (Afolabi, 2023).

However, current figures show that secondary school students in Nigeria suffer substantial academic hurdles, with the West African Examinations Council (WAEC, 2021) estimating that only around 35% of applicants completed five courses, including Mathematics and English, in 2021. Furthermore, the National Bureau of Statistics (2021) found that there is a

significant gap in student performance across geographical areas, with northern states trailing behind their southern counterparts. Supporting the preceding figures, the Nigerian Educational Research and Development Council (NERDC, 2022) said that students perform badly in crucial subjects such as mathematics and science, owing mostly to low teaching resources and poor instructional techniques. United Nations Educational, Scientific and Cultural Organization, UNESCO (2021), also indicated a greater dropout rate among students, which was reported to be over 20% during the same academic year, raising worries about future educational results. These negative statistics are further worsen by the current status of teaching and learning in Nigerian secondary schools as identified by Adetayo (2022), is characterized by poor facilities, restricted teaching resources, and obsolete curriculum, all of which significantly impede students' educational experiences. According to the Federal Ministry of Education (2020), teaching in Nigerian secondary schools is the process of transferring information, skills, and values to pupils via organized instruction and interactive involvement. Learning, on the other hand, is the active process by which students gain information, develop skills, and adopt attitudes that are critical to their academic and personal development. Teachers frequently encounter overcrowded classrooms, with student-to-teacher ratios exceeding 40:1, resulting in less individual attention and assistance for students (Odukoya, 2023). Furthermore, a lack of access to current teaching materials and technology reduces the effectiveness of instructional approaches, emphasizing the importance of incorporating technological integration into education (Ogunleye, 2022). As a result, implementing digital tools and approaches may not only increase engagement but also address the various learning needs within diverse classroom environments.

Nigeria's technological growth has seen a rebound, particularly in the last decade, as greater internet usage and mobile technologies enhance educational prospects. As a result, integrating technology into education has become critical, improving teaching methods and learner engagement across the country. According to Oxford Languages (2022), technology is the use of scientific knowledge for practical applications, particularly in industry. It includes tools, systems, equipment, and procedures used to simplify and enhance activities in a variety of industries. In educational settings, technology may help with communication, improve learning experiences, and enable access to previously unavailable resources and information. According to Nwafor and Nwoke (2020), integration of technology in teaching and learning can encourage new practices like e-learning and online resource sharing, which improves access to educational materials. Furthermore, according to Ekoja and Ogbale (2021), the Nigerian educational sector has seen a surge in the usage of digital platforms such as online courses and mobile learning applications that cater to a variety of learning styles and settings. This integration not only enhances learning but also prepares students for a technologically orientated work market. Ibrahim (2021) in the study of it demonstrated that incorporating technology into the teaching and learning processes may dramatically improve educational achievements in Nigerian secondary schools. According to Okebukola (2022), students who get technology-assisted education have higher levels of engagement and motivation, which leads to greater academic success than traditional teaching techniques. In line with the above discussion, data from Ali and Sulaiman (2023) indicated that technology promotes collaborative learning settings, allowing students to learn from one another while successfully using digital resources. As a result, investing in technology infrastructure and teacher training has the potential to revolutionize Nigeria's educational environment. However, various impediments, including infrastructural, skill, and cultural constraints, have been identified as influencing the multiple benefits of using technology into teaching and learning in secondary schools in Enugu Education Zone, Enugu State, Nigeria.

Infrastructure barriers to integration of technology in teaching and learning process include the absence of critical amenities such as power, internet access, and contemporary

classroom sets that facilitate the use of technology in education. According to Okebukola (2022), many secondary schools in Enugu State struggle to maintain constant power supply, which is essential for running computers and other digital equipment. Furthermore, inadequate internet connectivity restricts schools' capacity to use online instructional tools. According to Olaniyan and Okemakinde (2020), poor infrastructure is a major impediment to technology adoption in Nigerian schools. The authors suggested that without a dependable power source and internet access, technological integration becomes difficult. From these submissions it is clear that the lack of infrastructure in Nigeria including Enugu State may be a barrier to integration of technology in teaching and learning process. However, it is unclear which specific infrastructural factors constitute barriers to teaching and learning process in secondary schools in Enugu Education Zone, Enugu State thus this study.

Skill barriers to integration of technology in teaching and learning process include a lack of professional development opportunities for instructors, limiting their capacity to successfully employ technology tools in the classroom. Many instructors in Enugu State may be unfamiliar with the most recent teaching technologies or digital pedagogies, leaving a gap in their abilities to improve their teaching with technology. According to Eze and Chukwuma (2022), instructors frequently feel unprepared to adopt technology owing to a lack of training and support. The research findings show that continual professional development is critical for improving teachers' skills. Umeasiegbo (2023) supports this idea, claiming that tailored training programs focussing on practical technology use might considerably boost teachers' confidence and efficacy in the classroom. From the forgoing, it is evident that integration of technology in teaching and learning requires teachers to possess technological skill in order to utilize technologies appropriately. Therefore, skill as a barrier to integration of technology in teaching and learning process is a situation where the teachers and students lack the necessary technological skill to carry out teaching and learning process effectively. This is specifically unclear in the context of secondary schools in Enugu Education Zone, Enugu State thus this study.

Cultural barriers to integration of technology in teaching and learning process are views and ideas about technology among educators, students, and parents that might impede technology adoption in education. Some teachers may assume that old teaching techniques are more successful, resulting in resistance to embracing modern technologies. Furthermore, unfavourable attitudes towards technology among parents and community members might impact technology uptake in schools. Nwafor and Onyema (2021) discovered that cultural views about education have a substantial impact on the use of technology in education. According to the study, a mentality that favours traditional ways frequently discourages people from adopting new technologies. Asogwa (2022) also explores how instructors' and students' passion for technology and its significance to educational achievements is influenced by their scepticism. The study shows that altering these cultural biases through awareness campaigns and community engagement can facilitate technology integration in schools. It is also worthy to note that some demographic factors especially location may act as barrier to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone.

Geographic location in Enugu State, Nigeria, may be a barrier to integration of technology in teaching and learning process because location has a considerable impact on the availability and integration of technology in secondary schools, since metropolitan schools frequently have greater access to resources and internet connectivity than rural schools. This gap can create a digital divide, restricting rural kids' access to instructional materials and technology-enhanced learning experiences. Finally, these variables generate impediments that might impede overall educational quality and students' readiness for today's labour market (Ndukwe, 2023). Nevertheless, if research on the integration of technology into teaching and learning processes in secondary schools in Enugu State is not conducted, educators may

continue to function without knowing their students' special technological demands and problems. In support to this argument Uzoho and Ihuoma (2023), opined that this oversight may lead to inadequate teaching practices that may not engage students or improve their learning experiences. In the long run, a lack of research may worsen existing educational inequities and restrict the development of students' competences in critical areas such as digital literacy, which is essential for 21st-century success (Onyema & Anyanwu, 2023). Moreover, the absence of data could hinder efforts to innovate and improve educational practices, ultimately impacting students' preparedness for future employment and their ability to contribute positively to the society. It is against this background that this study examines the perceived barriers to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone, Enugu State.

The integration of technology into teaching and learning processes has become a central focus of contemporary educational reforms across the globe. Educational technology is widely acknowledged for its potential to enhance instructional delivery, improve students' engagement, support collaborative learning, and foster critical thinking skills. In secondary education, the effective use of information and communication technology (ICT) tools such as computers, interactive boards, internet resources, and digital learning platforms is increasingly regarded as essential for improving teaching quality and preparing students for a technology-driven society. Consequently, many education systems, including Nigeria's, have introduced policies aimed at promoting technology integration in schools. Within the school system, principals occupy a strategic position in facilitating or constraining the integration of technology. As instructional leaders and administrative heads, principals are responsible for setting the vision for technology use, mobilizing resources, supporting teachers' professional development, and ensuring the availability of ICT facilities. Empirical studies suggest that principals' attitudes, leadership styles, and perceptions significantly influence the extent to which technology is adopted and sustained in schools. Where principals perceive technology integration as valuable and feasible, they are more likely to encourage teachers, allocate resources, and create supportive environments for ICT-based teaching and learning.

Despite these recognized benefits, research consistently indicates that the integration of technology in secondary schools, particularly in developing countries, remains fraught with numerous challenges. Existing studies identify barriers such as inadequate ICT infrastructure, unreliable electricity supply, limited access to internet services, insufficient funding, lack of technical support, and inadequate training for teachers and school administrators. In addition, resistance to change, limited time for lesson preparation, and weak implementation of ICT policies further hinder effective technology use in classrooms. In the Nigerian context, these challenges are often compounded by systemic issues including poor maintenance culture, overcrowded classrooms, and inconsistencies in government support for ICT initiatives. Although several studies have examined barriers to technology integration in Nigerian secondary schools, much of the existing literature has focused predominantly on teachers' perspectives or has adopted a broad state-or national-level approach. Consequently, the specific perceptions of principals who play a pivotal role in decision-making and policy implementation at the school level have not been sufficiently explored. Moreover, there is a noticeable scarcity of empirical studies that concentrate on specific education zones, such as the Gu Education Zone in Enugu State, where contextual factors may uniquely shape the nature and intensity of perceived barriers.

Furthermore, many existing studies tend to identify barriers in general terms without adequately examining how principals' perceptions of these barriers influence actual practices related to technology integration in teaching and learning. There is also limited attention to variations across school contexts, such as differences between urban and rural schools or between well-resourced and poorly resourced institutions. Additionally, most studies rely

heavily on quantitative survey methods, thereby providing limited depth of understanding regarding the underlying reasons behind principals' perceptions. In view of these limitations, there remains a significant gap in the literature concerning principals' perceived barriers to the integration of technology in teaching and learning processes in secondary schools within the Gu Education Zone of Enugu State, Nigeria. Addressing this gap is crucial for generating context-specific evidence that can inform policy decisions, guide targeted interventions, and support principals in overcoming barriers to effective technology integration in secondary education.

Statement of the Problem

With recent advancement in technological development in Nigeria, incorporating technology into the teaching and learning process at secondary schools in Enugu State, Nigeria, is expected to result in increased student engagement, personalized learning experiences, and improved academic success. Educators ought to receive significant training and resources to efficiently deploy technology tools, while students would have equitable access to current equipment and internet connectivity, resulting in a more dynamic and engaging learning environment. This harmonic marriage of technology and education would encourage students' creativity, critical thinking, and collaboration abilities, preparing them for future problems. However, the current scenario in secondary schools in Enugu State demonstrates considerable impediments to effective technology integration. The researcher observed that many schools lack proper infrastructure, such as consistent internet connectivity and up-to-date technology, preventing both instructors and students from effectively using modern tools. In addition, a lack of teacher training and professional development sometimes leaves educators feeling unable to use technology into their lesson plans. Socioeconomic differences accentuate the problem, since not all students have access to personal devices, resulting in an uneven learning environment that stifles creativity and advancement.

The researcher was concerned that the lack of proper technology integration in teaching and learning has serious ramifications for secondary students in Enugu State. Students who do not use current instructional technologies are at a disadvantage when it comes to gaining crucial digital skills required for higher education and employment. This proficiency gap might result in decreased academic success, motivation, and educational engagement among students. Long-term, a lack of technology integration may prolong cycles of poverty and underdevelopment by limiting graduates' ability to participate in an increasingly digital economy. Finally, eliminating these hurdles is critical to helping students reach their full potential, improving their educational experiences, and developing a more educated and flexible community. Thus this study examines the perceived barriers to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone, Enugu State.

Purpose of the Study

The main purpose of this study is to determine the perceived barriers to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone, Enugu State. Specifically, the study sought to;

1. determine infrastructural barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone.
2. find out skill related barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone.
3. ascertain cultural barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone.

Research Questions

The following research questions guided this study:

1. What are the infrastructural barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone?
2. What are the skill related barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone?
3. What are the cultural barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone?

Hypotheses

The following null hypotheses were tested at .05 degree of significance;

1. There is no significant difference in the mean scores of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived infrastructural barriers to integration of technology in teaching and learning process
2. There is no significant difference in the mean scores of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived skill related barriers to integration of technology in teaching and learning process
3. There is no significant difference in the mean scores of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived cultural barriers to integration of technology in teaching and learning process

Methods

Descriptive survey research design was used for the study. This study was conducted in Enugu Education Zone of Enugu State. This area comprised Enugu North, Enugu East and Isi Uzo Local Government Area, Enugu State. The population consisted of all principals in secondary schools in Enugu Education Zone, Enugu State. According to PPSMB (2024), there are 33 principals (21 urban and 12 rural) in 33 secondary schools in Enugu Education Zone. Census sampling technique was adopted for this study because the population was adequate. The questionnaire titled "Integration of Technology in Teaching and Learning Process Questionnaire (ITTLPQ)" was used as the instrument for data collection. The questionnaire was validated by three experts; two from the Department of Educational Management and one from Department of Mathematics and Computer Education, with specialization in Measurement and Evaluation, all in the Faculty of Education, Enugu State University of Science and Technology ESUT, Agbani. The researcher visited all the schools and administered the questionnaire directly to the principals with the help of three research assistants. The administered instruments were collected on the spot in order to minimize error. However, 6 principals could not participate in the study therefore only 27 copies of the questionnaire were used for data analysis. This gave 82% return rate. Data collected on research questions relating to the study were analyzed using mean, standard deviation and t-test. The decision rule is that any item with the mean 2.50 and above on responses should be regarded as Agree (A), while below (2.50) should be considered as Disagree (D). For hypotheses, when the calculated t-value is equal or greater than the critical t-value, the null hypotheses would be accepted. On the other hand, when the calculated t-value is less than the critical t-value the null hypotheses would be rejected.

Results

Research Question 1: What are the infrastructural barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone?

Table 1: Mean and Standard Deviation Scores of Respondents on the infrastructural barriers to integration of technology in teaching and learning process n = 27

S/N	Infrastructural barriers to integration of technology in teaching and learning process;	Urban $\bar{X}_1$	N =21 SD_1	Rural $\bar{X}_2$	N = 6 SD_2	Overall $\bar{X}_G$	SD_G	Deci
1	Poor internet connectivity.	1.86	0.64	3.33	1.11	2.60	0.88	A
2	Inadequate electricity supply.	3.10	0.94	2.67	0.94	2.89	0.94	A
3	Lack of sufficient computer hardware.	3.62	0.65	2.50	1.12	3.06	0.89	A
4	Limited access to modern teaching aids.	2.81	0.96	2.83	1.34	2.82	1.15	A
5	Insufficient classrooms equipped for technology use.	1.81	0.85	2.17	0.90	1.99	0.88	D
6	Ineffective maintenance of existing technology.	3.24	0.87	3.33	0.94	3.29	0.91	A
7	Lack of funding for technological upgrades.	3.76	0.53	1.33	0.75	2.55	0.64	A
8	Inequitable distribution of resources among schools.	3.48	0.73	3.17	1.07	3.33	0.90	A
Cluster Mean/ SD		2.96	0.77	2.67	1.02	2.82	0.90	A

Key = A- Agree; D- Disagree; SD- Standard Deviation; Deci- Decision

Table one revealed that majority of the principals agreed with items on the tables. The overall mean of 2.82 signifies that infrastructural is a barrier to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone. The high value of the standard deviation of 0.90 indicates that the respondents have shown dispersion in the opinions as regards to the variable under investigation.

Hypothesis 1

There is no significant difference in the mean scores of responses of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived infrastructural barriers to integration of technology in teaching and learning process

Table 2: t-test of Difference between the Response of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived infrastructural barriers to integration of technology in teaching and learning process

Variables	N	Mean	SD	Df	P-value	t-cal	Sig	Decision
Urban	21	2.96	0.77	25	0.16	2.06	0.05	Accept Ho
Rural	6	2.67	1.02					

Key: N - Sample size; SD – Standard Deviation; Df – Degree of Freedom; t-cal – Table t value; Sig – Level of significance

Table 2 above shows that the calculated p-value is 0.16 while the critical t-value is 2.06 both measured at .05 level of significance and 25 degree of freedom. Since the calculated p-value (0.16) is greater than 0.05, the null hypothesis was accepted. It then shows that there is no significant difference in the mean score of response of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived infrastructural barriers to integration of technology in teaching and learning process

Research Question 2: What are the skill related barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone?

Table 3: Mean and Standard Deviation Scores of Respondents on the skill related barriers to integration of technology in teaching and learning process
n = 27

S/N	Skill related barriers to integration of technology in teaching and learning process;	Urban $\bar{X}_1$	N = 21 SD ₁	Rural $\bar{X}_2$	N = 6 SD ₂	Overall $\bar{X}_G$	SD _G	Deci
9	Lack of teacher training in technology use.	2.33	1.13	1.67	1.18	2.00	1.16	D
10	Insufficient digital literacy among students.	3.29	0.76	3.17	1.07	3.23	0.92	A
11	Limited access to professional development opportunities.	3.48	0.91	2.67	0.94	3.08	0.93	A
12	Resistance to adopting new teaching methods.	3.29	0.63	2.50	0.94	2.90	1.79	A
13	Inexperience with educational software.	3.00	0.76	3.33	1.11	3.17	0.94	A
14	Lack of confidence in using technology.	2.95	1.00	3.33	0.75	3.14	0.88	A
15	Limited training on integrating technology in the curriculum.	1.24	0.68	2.83	0.95	2.04	0.82	D
16	Failure to keep up with technological advancements.	2.90	0.92	2.83	0.90	2.87	0.91	A
Cluster Mean/ SD		2.81	0.85	2.79	0.98	2.80	0.92	A

Table three revealed that majority of the respondents in both rural and urban area agreed with majority of the items signifying that skill related factor is a barrier to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone. The overall mean of 2.80 signifies that skill related factor is a barrier to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone. The high value of the standard deviation of 0.92 indicates that the respondents have shown dispersion in the opinions as regards to the variable under investigation.

Hypothesis 2

There is no significant difference in the mean scores of responses of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived skill related barriers to integration of technology in teaching and learning process

Table 4: t-test of Difference between the Response of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived skill related barriers to integration of technology in teaching and learning process

Variables	N	Mean	SD	Df	P-value	t-cal	Sig	Decision
Urban	21	2.81	0.85	25	0.29	2.06	0.05	Accept Ho
Rural	6	2.79	0.98					

Table 4 above shows that the calculated p-value is 0.29 while the critical t-value is 2.06 both measured at .05 level of significance and 25 degree of freedom. Since the calculated p-value (0.29) is greater than 0.05 the null hypothesis was accepted. It then shows that there is no significant difference in the mean score of response of principals in secondary schools in rural

and urban location in Enugu Education Zone on their perceived skill related barriers to integration of technology in teaching and learning process

Research Question 3: What are the cultural barriers to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone?

Table 5: Mean and Standard Deviation Scores of Respondents on the cultural barriers to integration of technology in teaching and learning process

		n = 27						
S/N	Cultural barriers to integration of technology in teaching and learning process;	Federal	N = 21	State	N = 6	Overall		Deci
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_G$	SD_G	
17	Resistance to change in traditional teaching methods.	1.67	0.89	3.17	1.07	2.42	0.98	D
18	Doubts about the effectiveness of technology in education.	3.14	0.89	2.00	0.58	2.57	0.74	A
19	Societal preference for face-to-face interactions.	3.24	0.87	3.33	0.94	3.29	0.91	A
20	Gender biases affecting technology access for female students.	2.71	1.12	2.83	1.34	2.77	1.23	A
21	Misconceptions about technology among parents.	3.05	0.90	3.00	1.00	3.03	0.95	A
22	Fear of technology-related job displacement.	1.95	0.58	3.00	0.58	2.48	0.58	D
23	Cultural attitudes towards formal education and technology.	3.48	0.91	3.17	1.07	3.33	0.99	A
24	Stigma against students who struggle with technology.	3.29	0.63	3.67	0.75	3.48	0.69	A
Cluster Mean/ SD		2.82	0.85	3.02	0.92	2.92	0.89	A

Table five revealed that majority of the respondents in both rural and urban area agreed with majority of the items signifying that cultural factor is a barrier to integration of technology in teaching and learning process in secondary schools in Enugu Education Zone. The overall mean of 2.92 signifies that culture is a barrier to integration of technology in teaching and learning process as perceived by principals in secondary schools in Enugu Education Zone. The high value of the standard deviation of 0.89 indicates that the respondents showed dispersion in the opinions as regards to the variable under investigation.

Hypothesis 3

There is no significant difference in the mean score of response of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived cultural barriers to integration of technology in teaching and learning process

Table 4: t-test of Difference between the Response of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived cultural barriers to integration of technology in teaching and learning process

Variables	N	Mean	SD	Df	P-value	t-cal	Sig	Decision
Urban	21	2.82	0.85	25	0.36	2.06	0.05	Accept Ho
Rural	6	3.02	0.92					

Table 6 above shows that the calculated p-value is 0.36 while the critical t-value is 2.06 both measured at .05 level of significance and 25 degree of freedom. Since the calculated p-value

(0.36) is greater than 0.05 the null hypothesis was accepted. It then shows that there is no significant difference in the mean score of response of principals in secondary schools in rural and urban location in Enugu Education Zone on their perceived cultural barriers to integration of technology in teaching and learning process

Discussion

Findings revealed that one of the most major impediments to technology integration is insufficient infrastructure. Our research found that many schools lack critical gear (such as laptops and projectors) and dependable internet connectivity, both of which are required for efficient instructional technology use. Existing research supports similar findings, demonstrating that infrastructure is critical to technology adoption in schools. According to Olaniyan and Okemakinde (2020), without basic technology resources and dependable internet access, instructors and students are unable to fully interact with digital learning tools, resulting in stagnation of innovation in teaching techniques. However, it may be argued that even with limited resources, creative ideas can promote technology use in the classroom. For example, harnessing the rising availability of mobile phones has the potential to bridge certain access barriers. Odukoya (2023), identified mobile learning as a viable alternative, demonstrating that schools may innovate with low resources, creating a culture of adaptation rather than reliance on substantial infrastructure. While the infrastructure obstacles are real and serious, the researcher believes that educators and policymakers should look at alternative approaches and pilot projects that show effective low-cost technology deployments. This dual strategy might pave the way for a more sustainable integration over time.

The study also identified major gaps in instructors' and students' technical abilities as a barrier to integration. Many educators show confidence in their subject matter knowledge but feel unprepared to employ technology in their classrooms. According to a UNESCO (2021), successful technological integration depends not just on the availability of tools, but also on users' ability to navigate and implement them successfully. Teachers who do not receive enough training and continual professional development opportunities may feel overwhelmed, restricting their desire to utilize technology into their classes. Nonetheless, the emphasis on formal training raises concerns regarding flexibility and self-directed learning. Some studies have indicated that informal learning options, such as peer-led workshops and online tutorials, may successfully boost the digital abilities of instructors. According to a research by Onyema and Anyanwu (2023), instructors who actively seek out informal learning opportunities are more inventive in their teaching techniques, successfully incorporating technology into their classrooms without considerable formal training. The researcher believes that a balanced strategy that includes formal training as well as opportunities for self-directed and peer-supported learning would help instructors gain confidence and skill in using technology. Investing in continuing professional development that is customized to the particular challenges of integrating technology in Nigeria has the potential to equip teachers to become digital learning champions.

Cultural attitudes towards technology were also identified as an impediment to its incorporation into the Enugu Education zone. Many stakeholders, especially parents and community leaders, may be sceptical about technology's usefulness in education and would prefer conventional teaching techniques. Nwafor and Nwoke (2020) found that cultural views can considerably impact educational methods. If parents and communities do not see technology as a viable educational tool, their lack of support may jeopardize technology integration attempts. Their ideas might prolong reluctance among instructors who fear retribution or lack motivation to innovate. In contrast, Eze and Chukwuma (2022), argued that it is critical to recognize the opportunities in cultural behaviours. Using culturally appropriate information and demonstrating how technology may improve conventional educational methods may help change preconceptions. Involving community leaders in technological

literacy programs may also result in the development of community champions for digital learning, ultimately leading to a more favourable cultural climate. Recognizing the cultural limitations, the researcher sees enormous opportunity in community participation and awareness campaigns emphasizing the benefits of technology in schooling.

Conclusion

The study on the hurdles to integrating technology into secondary school teaching and learning processes in Nigeria's Enugu Education Zone found major difficulties that impede successful technology adoption. The findings showed that poor infrastructure, insufficient technical skills among instructors, and cultural opposition all hamper development towards a more technologically advanced educational environment. The lack of essential amenities such as computers, internet access, and other technical resources emphasizes the critical need for investment and growth. Similarly, instructors' lack of confidence and competency with technology demonstrates a compelling need for specialized professional development. Finally, cultural attitudes that undervalue technology integration point to a need for community participation and awareness-raising activities. Addressing these barriers is essential for the successful integration of technology in education and can lead to more effective teaching and learning outcomes.

Recommendations

The study recommended that:

1. Local and federal governments, as well as private-sector partnerships, should invest in improving secondary school technology infrastructure. This entails providing consistent internet connectivity, outfitting classrooms with current computing equipment, and assuring access to the software tools required for efficient teaching.
2. Schools should undertake continual training programs aimed at improving instructors' technical abilities. Workshops, seminars, and online courses should be organized to help educators improve their competency in utilizing technology for instructional objectives and gain confidence in incorporating novel teaching approaches.
3. Schools, along with community leaders and stakeholders, should develop efforts to promote the benefits of technology in education. Engaging parents and local communities in workshops and open forums can assist to transform cultural views and create a supportive climate for technology use in schools.

REFERENCES

- Afolabi, O. (2023). Objectives of secondary education in Nigeria: A focus on moral and cultural values. *Journal of Educational Policy and Practice*, 3(1), 22-29
- Aderinoye, R. (2021). The impact of vocational training on students' readiness for the workforce in Nigeria: A case study of secondary schools. *Journal of Vocational Education and Training*, 73(4), 591–605. <https://doi.org>
- Adetayo, J. (2022). Current state of teaching and learning in secondary schools in Nigeria. *Journal of Educational Research and Practice*, 12(4), 45–58.
- Ali, A., & Sulaiman, R. (2023). The role of technology in enhancing collaborative learning among secondary school students in Nigeria. *International Journal of Education and Development*, 8(2), 78–90.
- Asogwa, K. (2022). Parental perceptions of technology in education: Implications for student engagement in Nigeria. *African Journal of Educational Management*, 10(2), 27–40. <https://doi.org>

- Ekoja, I., & Ogbale, O. (2021). The role of technology in enhancing teaching and learning in Nigerian secondary schools. *International Journal of Education and Development*, 48(1), 25–32. <https://doi.org>
- Eze, I., & Chukwuma, E. S. (2022). Professional development for teachers: Key to effective technology integration in Nigerian schools. *Journal of Educational Technology Systems*, 50(1), 11–28. <https://doi.org>
- Federal Ministry of Education. (2020). *National policy on education*. Retrieved from <https://www.education.gov.ng/>
- Federal Ministry of Education. (2023). Universal Basic Education Act: Implementation and challenges. *Nigeria Bureau of Educational Statistics*.
- Ibrahim, T. (2021). Technology integration in classroom instruction: A pathway to improved educational outcomes in Nigerian secondary schools. *African Journal of Educational Studies*, 15(3), 123–135.
- NERDC (Nigerian Educational Research and Development Council). (2022). *Performance analysis of secondary school students in core subjects*. NERDC Press.
- NBS (National Bureau of Statistics). (2021). *Educational statistics in Nigeria: Trends and disparities*. Abuja: National Bureau of Statistics.
- Ndukwe, O. (2023). Digital divide in rural and urban education in Nigeria. *African Journal of Educational Research*, 5(2): 44-49
- Nwafor, I. A., & Onyema, E. M. (2021). Cultural beliefs and the challenges of technology integration in education: Exploring perspectives from Nigerian teachers. *Journal of Education and e-Learning Research*, 8(2), 135–144.
- Nwafor, S., & Nwoke, M. (2020). Preparing students for a technology-driven job market: Integrating technology in teaching and learning in Nigeria. *Nigerian Journal of Educational Research and Development*, 17(2), 45–58.
- Okebukola, P. (2022). Technology-assisted instruction and academic performance in Nigerian secondary schools: A quantitative analysis. *Journal of Educational Technology*, 19(1), 34–50.
- Ogunleye, A. (2022). The importance of digital tools in enhancing teaching methods in Nigerian secondary schools. *Journal of Contemporary Educational Research*, 14(2), 67–80.
- Okoro, A. (2023). Accessing technology in Nigeria's secondary schools: A comparative study. *Journal of Information Technology in Education*.
- Olaniyan, D. A., & Okemakinde, J. (2020). Barriers to the integration of information and communication technology in Nigerian higher education institutions: A systematic review. *International Journal of Educational Management*, 34(4), 720–733. <https://doi.org>
- Odukoya, O. (2023). Addressing the challenges of overcrowded classrooms in Nigerian secondary schools. *Nigerian Journal of Educational Administration and Planning*, 10(1), 102–115.
- Onyema, O., & Anyanwu, I. (2023). The impact of technology on teaching and learning in Nigeria. *Educational Technology Review*, 2 (1): 2-7
- Oxford Languages. (2022). Definition of technology. Retrieved from <https://languages.oxfordlearnersdictionaries.com/>
- UNESCO (United Nations Educational, Scientific and Cultural Organization). (2021). *Global education monitoring report: Challenges and prospects in Nigerian education*. Paris: UNESCO Publishing.
- Umeasiegbo, C. (2023). Enhancing teacher confidence in technology integration through training programs: Lessons from Nigerian secondary schools. *International Journal of Technology in Education and Science*, 7(3), 268–283. <https://doi.org>

- Uzoho, C., & Ihuoma, P. (2023). Engaging students through technology: The need for effective strategies. *Journal of Curriculum and Instruction*.
- WAEC (West African Examinations Council). (2021). *West African senior school certificate examination results statistics*. WAEC Publication.