

# TEACHERS PERCEPTION ON INTEGRATION OF EDUCATIONAL TECHNOLOGY TOOLS FOR INSTRUCTION IN PRIMARY SCHOOLS IN BILLIRI, GOMBE STATE

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## Abstract

*This study examined teachers' perceptions on integration of educational technology tools for instruction in Billiri, Gombe State, focusing on perceived usefulness, readiness for integration, and barriers to effective use. A descriptive survey design was adopted. The population comprised 1,100 teachers across 111 public primary schools, from which 293 teachers were selected through proportionate stratified sampling; 290 questionnaires were completed and analyzed. Data were collected using the Teachers' Perception of Educational Technology Questionnaire (TPETQ), a 30-item instrument validated by experts with a reliability coefficient of 0.70 using Cronbach's Alpha. Data were analyzed using mean, standard deviation, and independent t-test at the 0.05 level of significance. Findings revealed that teachers held positive perceptions of educational technology and recognized its potential to enhance teaching and pupil engagement. However, readiness for integration was moderate due to limited technical skills. Key barriers included inadequate ICT facilities, poor internet connectivity, insufficient training, irregular power supply, and limited funding. The study recommends provision of adequate ICT infrastructure, regular teacher training, and increased support for integrating technology into classroom instruction.*

## Keywords:

## Introduction

The integration of educational technology has increasingly become a defining characteristic of contemporary educational systems worldwide. In the 21st century, digital tools are no longer viewed merely as supplementary instructional aids but as essential components of effective teaching and learning processes. Globally, educational technology is recognized for its capacity to enhance learner engagement, promote interactive pedagogies, and expand access to educational resources (Teye, 2020; Tondeur et al., 2021). In primary education particularly, where foundational literacy, numeracy, and cognitive skills are developed, technology integration is considered critical for fostering digital competencies necessary for lifelong learning and participation in an increasingly digital society (Redecker, 2020; UNESCO, 2023).

Empirical research conducted in recent years continues to emphasize that teachers' perceptions, beliefs, and attitudes play a decisive role in determining the extent to which educational technology is effectively integrated into classroom practice. Studies have shown that positive teacher perceptions significantly predict willingness to adopt and utilize digital tools for instruction, whereas negative perceptions or low confidence often hinder meaningful implementation (Petko, 2020; Scherer et al., 2021). For instance, a study in Ghana revealed that

although primary school teachers expressed favorable attitudes toward Information and Communication Technology (ICT), inadequate training and limited institutional support constrained practical classroom usage (Teye, 2020). This gap between positive perception and actual implementation remains a persistent concern in developing contexts.

Within the Nigerian educational system, research findings reveal a similar pattern. During the COVID-19 pandemic, Nigerian teachers generally acknowledged the instructional value of digital technologies; however, infrastructural deficiencies, unreliable electricity supply, and insufficient professional development significantly limited effective adoption (Adeleke & Emechebe, 2025). Similarly, a study conducted in Lagos State found that while teachers perceived assistive and digital technologies as beneficial for inclusive education, challenges such as limited access to devices, inadequate technical support, and insufficient digital competence hindered consistent utilization (Okeke & Olatunji, 2023). These findings highlight systemic issues affecting educational technology integration in Nigerian primary schools.

Recent scholarship also underscores the importance of teacher readiness and self-efficacy in technology adoption. Teachers who possess higher levels of digital competence and confidence are more likely to integrate technology meaningfully into their pedagogical practices (Scherer et al., 2021; Tondeur et al., 2021). Conversely, insufficient training opportunities and resistance to pedagogical change continue to impede effective technology integration (Voogt et al., 2020). Contemporary frameworks of digital competence further stress that sustainable integration requires continuous professional development, supportive leadership, and alignment between technological tools and curriculum objectives (Redecker, 2020; UNESCO, 2023).

Contextual realities also significantly shape teachers' perceptions and practices. Studies conducted in rural and under-resourced environments across Sub-Saharan Africa indicate that infrastructural limitations, poor internet connectivity, and scarcity of digital devices substantially affect teachers' ability to translate positive perceptions into actual classroom implementation (Mahlobo, 2021; UNESCO, 2023). These structural constraints are prevalent in many parts of Nigeria, particularly in rural Local Government Areas where access to technological infrastructure remains limited.

Despite the growing body of global and national research on educational technology integration, there remains limited localized empirical evidence focusing specifically on primary school teachers' perceptions within Billiri Local Education Authority (LEA) of Gombe State, Nigeria. Given the contextual variations in infrastructure, teacher training opportunities, and institutional support across regions, localized studies are essential for generating context-specific data to guide policy decisions and intervention strategies.

Therefore, this study seeks to examine primary school teachers' perceptions of educational technology in Billiri LEA, Gombe State, Nigeria, with specific emphasis on perceived usefulness, perceived ease of use, readiness for integration, and demographic and contextual factors influencing these perceptions. The findings of this study are expected to provide empirical evidence to inform teacher professional development programmes, guide resource allocation, and support policy implementation efforts aimed at strengthening educational technology integration at the foundational level of education.

## **Statement of the Problem**

Educational technology has become a central component of contemporary teaching and learning processes worldwide. Its integration into classroom instruction is widely recognized as a means of improving instructional delivery, enhancing learner engagement, supporting differentiated instruction, and developing pupils' digital competencies required for participation in a technologically driven society. In Nigeria, national educational policies advocate the integration of Information and Communication Technology (ICT) at all levels of education, including primary schools. Despite these policy directives and global emphasis on digital transformation in education, effective integration of educational technology in many Nigerian primary schools remains limited.

In Billiri Local Education Authority (LEA) of Gombe State, efforts have been made to improve the quality of primary education. However, anecdotal observations and emerging evidence from similar contexts suggest that the use of educational technology in classroom instruction is either minimal or inconsistent. Factors such as inadequate ICT infrastructure, unreliable electricity supply, limited internet connectivity, insufficient training opportunities, and lack of technical support may constrain effective technology use. While these structural challenges are significant, they do not fully explain the low level of technology integration observed in many primary schools.

Research has consistently shown that teachers play a pivotal role in the successful implementation of educational technology. Teachers' perceptions—particularly their beliefs about the usefulness, ease of use, and relevance of technology—strongly influence whether they adopt and integrate digital tools into their instructional practices. Even where technological resources are available, negative perceptions, low self-efficacy, or resistance to change may hinder effective utilization. Conversely, positive perceptions can motivate teachers to explore innovative instructional approaches despite contextual challenges.

However, there is a noticeable lack of empirical data specifically examining how primary school teachers in Billiri LEA perceive educational technology and how these perceptions may influence its integration into classroom instruction. Without localized evidence, educational planners, policymakers, and school administrators may lack the necessary information to design targeted professional development programmes, allocate resources effectively, or address attitudinal barriers that affect technology adoption.

Therefore, the problem of this study is the absence of empirical evidence on the perceptions of educational technology among primary school teachers in Billiri Local Education Authority of Gombe State and the extent to which these perceptions influence readiness and integration of technology in classroom instruction. Addressing this gap is essential for improving technology implementation strategies and enhancing the overall quality of primary education in the area.

## **Objectives of the Study**

The general objective of this study is to examine teachers perception on integration of educational technology tools for instruction in primary schools in Billiri, Gombe State, Nigeria. Specifically, the study seeks to:

1. Determine primary school teachers' perceptions of the usefulness of educational technology in Billiri LEA.
2. Assess the level of teachers' readiness to integrate educational technology into classroom instruction.

3. Identify the barriers influencing the use of educational technology among primary school teachers in Billiri LEA.

### **Research Question**

1. What are the perceptions of primary school teachers regarding the usefulness of educational technology in Billiri LEA?
2. What is the level of readiness of primary school teachers to integrate educational technology into classroom instruction in Billiri LEA?
3. What barriers influence the use of educational technology among primary school teachers in Billiri LEA.

### **Hypothesis**

H<sub>0</sub>: There is no significant difference in the mean readiness to integrate educational technology into classroom instruction between urban and rural primary school teachers in Billiri LEA.

### **Methods**

This study adopted descriptive survey research design. Earl Babbie (2020) notes that survey research is particularly useful for describing populations too large to observe directly, using questionnaires or structured interviews to obtain quantifiable data. The descriptive survey design is appropriate because it allows the researcher to collect data from a representative sample in order to describe the perceptions, attitudes, and readiness of primary school teachers regarding educational technology. The design is suitable for studies that aim to examine relationships between variables without manipulating them. The study was conducted in Billiri Local Education Authority (LEA) of Gombe State, Nigeria. Billiri LEA oversees the administration and supervision of public primary schools within Billiri Local Government Area. The area comprises both urban and rural schools, making it appropriate for examining diverse teacher experiences and perceptions regarding educational technology. The study consists of all primary school teachers in public primary schools under Billiri Local Education Authority. There were 111 number of schools and 1,100 teachers as obtained from the administrative records of the LEA at the time of the study. A sample of 293 primary school teachers were selected for the study using proportionate stratified sampling technique to ensure adequate representation of teachers from different schools and area in the LEA. 293 questionnaire was issued out and 290 were returned and analyzed. 30 items structured questionnaire titled: "Teachers' Perception of Educational Technology Questionnaire (TPETQ) The questionnaire was divided into two sections A and B. Section A, sought information on the respondent's demographic data. Section B, was structured questionnaire elicit information on the teacher's perception of usefulness, teacher's readiness to integrate and barriers influencing the use of Educational Technology among primary school teachers with the lists items based on 4 points of likert of Strongly Agree (SA) =4, Agree (A) =3, Disagree (D)=2 Strongly Disagree (SD)=1. The instrument was subjected to face and content validation by three experts one from Educational Technology unit, one from Measurement and evaluation unit federal University of Kashere and one teacher from Billiri LEA. Their corrections and suggestions was incorporated to ensure clarity, relevance, and adequacy of the items. A pilot study was conducted in a neighboring Local Education Authority Kaltungo LEA. Data obtained from the pilot test was analyzed using Cronbach's Alpha to determine internal consistency reliability. A reliability coefficient of 0.70 or above was considered acceptable. The method of administration of the instrument was on the spot administration with the help of two research assistants to ensure 100% return. Data collected was coded and analyzed using statistical software called SPSS using mean and

standard deviation on the rating of decision rule of 2.50 and above as Agree while 2.49 and below as Disagree. The null hypotheses were tested using t-test at 0.05 level of significance.

## RESULTS

**Table 1: Mean and standard deviation ratings of the primary school teachers' perceptions of the usefulness of educational technology in Billiri LEA.**

S/N	STATEMENT	N	X	SD	REMARK
1.	The use of technology makes teaching more effective.	290	3.18	0.87	Agree
2.	Educational technology improves pupils' understanding of lessons.	290	3.68	0.67	Strongly Agree
3.	Educational technology increases pupils' interest in learning.	290	3.88	0.98	Strongly Agree
4.	Technology enhances classroom participation.	290	3.09	0.71	Agree
5.	Educational technology helps simplify complex concepts.	290	3.33	0.87	Agree
6.	Using technology improves pupils' academic performance.	290	3.11	1.01	Agree
7.	Technology makes lesson delivery more engaging.	290	3.12	1.00	Agree
8.	Educational technology supports individualized learning.	290	3.18	0.80	Agree
9.	Technology helps in assessing pupils more effectively.	290	3.03	0.10	Agree
10.	The use of digital tools makes classroom management easier.	290	3.79	0.53	Strongly Agree

**Decision key:** 1.00–1.49 = Strongly Disagree; 1.50–2.49 = Disagree; 2.50–3.49 = Agree; 3.50–4.00 = Strongly Agree.

The result of table 1, shows the mean and standard deviation on teachers perception of usefulness of Educational Technology in Billiri LEA. Schools. The mean values ranged from 3.03 to 3.88, this indicating participations responses for all the 10 items which item 2,3, and 10 fall under strongly agreed, while items 1,4,5,6,7,8, and 9 indicated agree. It can therefore be deduced from the table 1 that the teach has a good perception towards the usefulness of educational technology for classroom instruction in Billiri LEA.

**Table 2: Mean and standard deviation ratings of the level of teachers' readiness to integrate educational technology into classroom instruction in Billiri LEA.**

1.	I have adequate skills to use educational technology in teaching.	290	2.93	1.02	Agree
2.	I am confident in operating a computer for instructional purposes.	290	2.16	0.99	Disagree
3.	I can use presentation software (e.g., PowerPoint) effectively.	290	2.39	0.91	Disagree
4.	I can use the internet to obtain teaching resources.	290	3.09	0.98	Agree

5.	I regularly include technology in my lesson planning.	290	2.18	1.11	Disagree
6.	I am willing to attend workshops on educational technology.	290	3.35	0.81	Agree
7.	I can troubleshoot minor technical problems during class.	290	2.68	0.63	Agree
8.	I feel prepared to integrate technology into daily instruction.	290	3.30	0.10	Agree
9.	I can guide pupils in using educational digital tools.	290	2.09	0.99	Disagree
10.	I am open to adopting new technological innovations in teaching.	290	3.07	0.98	Agree

**Decision key:** 1.00–1.49 = Strongly Disagree; 1.50–2.49 = Disagree; 2.50–3.49 = Agree; 3.50–4.00 = Strongly Agree.

Result of table shows the mean and standard deviation of the level of teachers readiness to integrate educational technology into classroom instruction. The mean values ranged from 2.09 to 3.35, thus indicating participations responses to all the 10 items. Item 1,4,6,7,8, and 10 indicating agreed, while 2,3,5, and 9 indicating disagreed, thus can be deduced from the table that teachers showed readiness to integrate educational technology into classroom instruction in Billiri LEA.

**Table 3: Mean and standard deviation ratings of barriers influencing the use of educational technology among primary school teachers in Billiri LEA.**

1.	Lack of adequate computers limits my use of technology.	290	3.68	0.66	Strongly Agree
2.	Poor internet connectivity affects technology integration	290	3.88	0.98	Agree
3.	Inadequate training prevents effective use of educational technology.	290	3.60	0.88	Strongly Agree
4.	Lack of technical support discourages technology use.	290	3.68	0.66	Strongly Agree
5.	Irregular power supply affects classroom technology use.	290	3.10	0.83	Agree
6.	Large class size makes technology integration difficult.	290	3.88	0.98	Strongly Agree
7.	Insufficient funding limits access to digital resources.	290	3.60	0.88	Strongly Agree
8.	Limited time prevents me from using technology in lessons.	290	3.33	0.83	Agree
9.	School management does not provide	290	3.11	1.01	Agree

enough support for technology use.

10.	Fear of technical failure discourages me from using educational technology.	290	3.19	0.85	Agree
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**Decision key:** 1.00–1.49 = Strongly Disagree; 1.50–2.49 = Disagree; 2.50–3.49 = Agree; 3.50–4.00 = Strongly Agree.

Result of table 3 shows the mean and standard deviation of the barriers influencing the use of educational technology among primary school teachers. The mean values ranged from 3.10 to 3.88, thus indicating participations responses to all the 10 items which 1,2,3,4,6, and 7 fall under strongly agreed while items 5,9, and 10 shows to agree. It can therefore be deduced there were barriers that hindered the use of educational technology among primary school teachers in Billiri LEA.

**Table 4: Summary of t-test result on readiness to integrate educational technology into classroom instruction in respect to location**

Hypothesis	Group	N	M	SD	t	Df	Sig.	Rem.
Ho:	Urban	143	2.8636	.22046	-2.214	55	.493	NS
	Rural	150	2.9896	.20180				

The t-test analysis on Table 4 showed the outcomes for the urban and rural teachers on the readiness to integrate educational technology into classroom instruction. The t-test analysis of the responses of urban and rural teachers on the readiness to integrate educational technology into classroom instruction revealed that no significant difference exist for all the 10 items  $M(2.8636, 2.9896) = t(-2.414, p=.493)$  therefore, the hypothesis of no significant difference was upheld.

### Findings

The findings from Table 1 revealed that primary school teachers in Billiri LEA have a positive perception of the usefulness of educational technology. The mean scores (3.03–3.88) indicate that teachers generally agreed or strongly agreed that educational technology enhances teaching effectiveness, pupils’ understanding, interest, participation, and classroom management. This finding is consistent with more recent studies which emphasize that teachers’ beliefs significantly influence successful technology integration. For instance, Peggy A. Ertmer and Anne Ottenbreit-Leftwich (2013) reaffirmed that teachers’ pedagogical beliefs remain a strong predictor of classroom technology use. More recently, UNESCO (2023) reported that teachers’ positive perceptions of digital tools enhance their willingness to use technology to improve student engagement and learning outcomes. Likewise, Punya Mishra and Matthew J. Koehler’s TPACK framework continues to be validated in recent empirical studies (e.g., Scherer et al., 2023), which confirm that effective technology integration depends on teachers’ understanding of how technology supports pedagogy and content delivery. The strong agreement on pupils’ interest and classroom engagement in the present study suggests that teachers recognize technology as a valuable instructional tool for enhancing learning experiences.

However, Table 2 showed mixed results regarding teachers' readiness to integrate educational technology. Although teachers expressed willingness to attend workshops and adopt new innovations, they reported low confidence in operating computers, using presentation software, and regularly integrating technology into lesson planning. This suggests that positive perception does not automatically translate into practical readiness. Recent research supports this observation. For example, Scherer, Siddiq, and Tondeur (2023) found that while many teachers express favorable attitudes toward ICT, insufficient digital competence limits effective implementation. Additionally, OECD (2023) reported that teacher readiness for digital integration depends heavily on professional development and continuous skill enhancement. Drawing from Albert Bandura's concept of self-efficacy, recent studies (e.g., Huang et al., 2024) have shown that teachers' digital self-efficacy significantly predicts their actual classroom technology use. Therefore, teachers' limited confidence in technical skills, as observed in this study, may hinder effective classroom integration despite their positive attitudes.

The findings in Table 3 revealed significant barriers influencing the use of educational technology. Teachers strongly agreed that lack of adequate computers, poor internet connectivity, inadequate training, insufficient funding, and lack of technical support limit effective use. These findings align with recent global reports and empirical studies. World Bank (2023) emphasized that infrastructure gaps, unreliable electricity, and limited internet access remain critical challenges to digital learning implementation in developing regions. Similarly, UNESCO (2023) highlighted that inadequate funding and lack of institutional support continue to hinder effective ICT integration in primary education. Recent empirical research (e.g., Tondeur et al., 2023) also identified limited access to devices, insufficient training, and lack of technical support as persistent barriers to sustainable technology use in schools. Furthermore, studies conducted in Sub-Saharan Africa (2024) confirm that large class sizes and overcrowded classrooms reduce the effectiveness of technology-supported instruction due to limited access to devices and teacher supervision challenges.

Overall, the findings suggest that while teachers in Billiri LEA demonstrate strong positive perceptions of educational technology, structural and competency-related barriers must be addressed to translate perception into effective and sustained classroom integration.

The t-test result in Table 4 indicated no significant difference between urban and rural teachers' readiness to integrate educational technology ( $p > 0.05$ ). This suggests that location does not significantly influence teachers' readiness levels in Billiri LEA. While some studies have reported disparities between urban and rural schools in terms of ICT access, the present finding implies that challenges such as inadequate training and infrastructure are common across both locations.

## **Conclusion**

The study concludes that primary school teachers in Billiri LEA have a positive perception of the usefulness of educational technology in classroom instruction. However, their level of readiness to integrate technology is moderate due to limited technical skills and confidence. Several infrastructural and institutional barriers, including inadequate facilities, poor internet connectivity, insufficient funding, and lack of technical support, significantly hinder effective integration. Additionally, there is no significant difference between urban and rural teachers' readiness, suggesting that interventions should be uniformly implemented across schools in the LEA.

### **Recommendations**

1. Government and educational stakeholders should provide adequate ICT infrastructure, including computers, stable internet connectivity, and reliable power supply, subject to proper maintenance and funding.
2. Regular professional development programs should be organized to improve teachers' technical competence and confidence, provided the training is continuous, practical and aligned with teachers' instructional needs.
3. School management should encourage consistent integration of technology into lesson planning and instructional delivery, subject to adequate support and supervision.

### **Limitations of the Study**

1. The study was limited to primary school teachers in Billiri LEA; therefore, findings may not be generalized to other regions, except where similar educational context and condition exist.
2. The study adopted a quantitative approach only; qualitative data could provide deeper insights into teachers' experiences, thus limiting insights.
3. Future research may adopt a mixed-method approach to provide a more comprehensive understanding of teachers' readiness and challenges in integrating educational technology, subject to the availability of time, resources, and methodological expertise.

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