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TEACHERS' READINESS AND INSTITUTIONAL CAPACITY FOR EMERGING TECHNOLOGY INTEGRATION IN PLATEAU STATE BASIC SCHOOLS

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ABSTRACT
This study examined teachers' readiness and institutional capacity for integrating emerging technologies into the basic education curriculum in Plateau State, Nigeria. Grounded in the Technological Pedagogical Content Knowledge (TPACK) framework and Rogers' Diffusion of Innovations Theory, the study employed a descriptive survey design. A sample of 334 respondents, comprising 288 teachers and 46 school administrators, was drawn from 60 basic schools across six local government areas using stratified random sampling. Data were collected using a validated researcher-designed questionnaire titled "Emerging Technology Integration Readiness Scale" (ETIRS), with a reliability coefficient of 0.84 (Cronbach's Alpha). Findings revealed that teachers possessed moderate ICT skill levels (cluster mean = 2.48) but demonstrated limited experience with advanced and AI-based educational tools. Professional development exposure was inadequate (cluster mean = 2.37), while institutional infrastructure capacity was rated critically low (cluster mean = 1.95). Challenges identified included erratic power supply, poor internet connectivity, inadequate ICT devices, and insufficient funding. Based on these findings, the study recommends sustained government investment in digital infrastructure, structured and context-sensitive teacher professional development programmes, and development of a technology integration policy framework tailored to the realities of basic education in Plateau State.

Keywords: Emerging technology, technology integration, teachers' readiness, institutional capacity, basic education, curriculum.

Introduction

The global educational landscape is undergoing a profound transformation driven by the rapid advancement of digital and emerging technologies. Across both developed and developing nations, technology has increasingly become a catalyst for improving pedagogical outcomes, expanding access to quality education, and fostering innovation in curriculum delivery. In Nigeria, where the education system faces multifaceted challenges including large class sizes, inadequate infrastructure, and inconsistent policy implementation, the integration of emerging technologies holds significant promise for addressing systemic deficiencies and aligning the curriculum with 21st-century competencies (Adeoye, Prastikawati, and Abimbowo, 2024).

Emerging technologies in education encompass a wide spectrum of tools and platforms including Artificial Intelligence (AI), Augmented and Virtual Reality (AR/VR), cloud computing, learning management systems (LMS), robotics, and interactive digital content. These technologies are reshaping how knowledge is constructed, transmitted, and assessed, prompting curriculum developers and education policymakers worldwide to re-examine the relevance and structure of existing curricula. The Nigerian National Policy on Education (Federal Republic of Nigeria, 2014) acknowledged the centrality of ICT in educational development; however, effective implementation has lagged significantly behind policy intentions.

Plateau State, located in the north-central geopolitical zone of Nigeria, represents a microcosm of the broader national challenges in educational technology adoption. Despite its relatively diverse educational infrastructure, the state grapples with issues such as inadequate power supply, insufficient ICT equipment in schools, low levels of teacher digital literacy, and inconsistent government investment in educational technology. Basic education comprising pre-primary, primary, and junior secondary levels forms the foundational tier of the Nigerian education system, and it is at this level that technology integration can have the most transformative and long-lasting impact on learner outcomes.

The effectiveness of technology integration in any educational system depends fundamentally on two interrelated factors: teachers' readiness and institutional capacity. Teachers' readiness refers to the disposition, skill set, knowledge, and confidence of educators to incorporate technology meaningfully into their instructional practice. Institutional capacity, on the other hand, encompasses the structural, financial, infrastructural, and policy support systems that schools and educational authorities provide to enable and sustain technology use. Without adequate attention to both dimensions, efforts at technology integration are likely to remain superficial and unsustainable.

Despite a growing body of literature on technology integration in Nigerian secondary and tertiary education, empirical research focusing specifically on basic education and especially in the context of Plateau State remains limited. This gap in the literature necessitates a focused inquiry into the current state of readiness among basic school teachers and the capacity of institutions to support meaningful technology integration. The present study is designed to address this gap through a systematic empirical investigation.

Statement of Problem

Teachers frequently report inadequate training, lack of devices, and poor infrastructure as barriers to technology adoption, yet comprehensive empirical data on these challenges within the Plateau State basic education context are scarce.

The absence of reliable data on teachers' digital competence levels, the availability of technology resources in schools, and the preparedness of school institutions to support

technology driven instruction has made it difficult for policymakers and curriculum planners to develop targeted, evidence-based interventions. This study was therefore undertaken to generate empirical evidence on these critical dimensions, with a view to informing policy and practice in Plateau State.

Objectives of the Study

The study was guided by the following specific objectives:

1. To assess the ICT skills readiness of teachers in basic schools in Plateau State for emerging technology integration.
2. To determine the level of professional development of basic school teachers for technology integration in Plateau State.
3. To evaluate the institutional capacity of basic schools in Plateau State to support emerging technology integration.
4. To identify the challenges facing teachers and institutions in integrating emerging technologies in basic education curriculum in Plateau State.

Research Questions

The following research questions guided the study:

1. What is the level of ICT skills readiness of teachers in basic schools in Plateau State for emerging technology integration?
2. To what extent have basic school teachers in Plateau State received professional development for technology integration?
3. What is the institutional capacity of basic schools in Plateau State to support emerging technology integration?
4. What are the challenges facing teachers and institutions in integrating emerging technologies in the basic education curriculum in Plateau State?

Hypotheses

The following null hypotheses were tested at $p < 0.05$ level of significance:

1. There is no significant difference in the ICT skills readiness of teachers in public and private basic schools in Plateau State.
2. There is no significant relationship between teachers' professional development exposure and their technology integration practices in Plateau State basic schools.
3. There is no significant difference in the institutional capacity for technology integration between urban and rural basic schools in Plateau State.

Literature Review

Conceptual Framework

Emerging Technologies in Education

The concept of emerging technologies in education has evolved significantly over the past two decades. Enang (2022) defined emerging technologies as modern educational tools and digital media applications whose technical potentials are rapidly expanding and which are directly capable of restructuring, influencing, and enhancing the processes and outcomes of teaching and learning within educational institutions. Okon (2021) conceptualized emerging technologies as a dynamic array of contemporary digital learning tools including virtual reality, wearable devices, and artificial intelligence-driven platforms that continuously redefine pedagogical delivery and open up ubiquitous learning spaces. Ogunbodede and Achugbue (2023) described emerging technologies in education as advanced interactive platforms and smart learning environments that utilize computer technology and data

management systems to fundamentally alter how students access learning content, modules, and instructional interfaces. Nnadi and Saue (2023) characterized emerging technologies as scalable, technology-driven solutions such as mobile learning applications and artificial intelligence systems that provide modern alternatives to traditional instruction, particularly optimized for post-pandemic educational recovery. Obuh and Ogbomo (2024) defined innovative and emerging educational technologies as cutting-edge digital infrastructures—spanning cloud computing, the Internet of Things, and intelligent software that are systematically integrated to drive modern instructional delivery and institutional service efficiency.

Teachers' Readiness for Technology Integration

Teachers' readiness for technology integration is a multidimensional construct that encompasses cognitive, affective, and behavioural dimensions. Cognitive readiness refers to the knowledge teachers possess about technology and its instructional applications. Affective readiness pertains to teachers' attitudes and perceptions toward technology use. Behavioural readiness relates to the actual practices and habits teachers exhibit when incorporating technology into their teaching (Tondeur et al., 2012).

Nwoka et al. (2024) framed teacher and educator readiness as the baseline possession of essential digital literacy competencies, internet fundamentals, and technical know-how required to effectively deploy innovative digital systems in instructional and academic environments. Yushau and Nannim (2020) viewed technology integration readiness as an educator's preparedness influenced by their functional literacy levels, pedagogical attitudes, and the ready availability of institutional ICT facilities to support teaching processes. Chukwueke and Idris (2023) described readiness as a practical capability and skill threshold encompassing software application proficiency, webpage management, and database utilization that determines whether educators can successfully transition from traditional instruction to digital dissemination. Umoru et al. (2024) conceptualized technology readiness among educators as the acquisition of targeted modern digital competencies through professional training and curriculum alignment designed to boost instructional performance and learner employability. Nwajiuba and Ukwandu (2021) defined teacher readiness in the context of digital transformation as an educator’s preparedness, enabled through targeted professional development programs, to bridge technological gaps and implement inclusive digital tools within classrooms.

Institutional Capacity for Technology Integration

Institutional capacity in the context of educational technology refers to the school's ability to provide the necessary conditions for teachers to effectively integrate technology. This includes hardware and software infrastructure, reliable internet access, technical support, leadership commitment, financial resources, and institutional policy frameworks (Schrum and Levin, 2013).

Edomienkuma (2026) described institutional capacity as the structural, administrative, and workforce strength of an organization combining institutional memory and digital flexibility to successfully process policies and manage technological tasks without administrative bottlenecks. Ajuzieogu (2026) conceptualized institutional capacity for technological integration as an organization’s baseline adequacy in digital infrastructure, data availability, and resource distribution that prevents productivity disparities and digital divides. Obuh and Ogbomo (2024) framed institutional capacity as the presence of robust network infrastructures, hardware maintenance frameworks, and supportive digital environments that enable institutions to overcome underutilization or abandonment of advanced educational platforms. Dumbiri and Nwadiani (2020) defined institutional capacity as an organization’s

infrastructural resilience specifically reliable power supply, robust broadband connectivity, and consistent funding that dictates the seamless scaling of e-learning and technology-driven programs. Ojewale (2024) characterized institutional capacity for technology integration as the operational preparedness and structural strength of public systems to deploy advanced digital tools effectively despite challenging environments and limited resource baselines.

Theoretical framework

TPACK Framework

This study is anchored in the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006), which builds on Shulman's (1986) notion of Pedagogical Content Knowledge (PCK). TPACK posits that effective technology integration in teaching requires the intersection of three domains of knowledge: technological knowledge (understanding how specific technologies work), pedagogical knowledge (understanding how to teach), and content knowledge (understanding the subject matter). The framework is particularly relevant to this study because it situates teachers' technology readiness within the context of actual instructional practice rather than treating it as an abstract technical competency.

Rogers' Diffusion of Innovations Theory

Rogers' (2003) Diffusion of Innovations Theory provides a complementary theoretical lens for understanding how emerging technologies are adopted within educational institutions. The theory identifies five categories of adopters' innovators, early adopters, early majority, late majority, and laggards and highlights the role of social systems, communication channels, and the perceived attributes of innovations (relative advantage, compatibility, complexity, trialability, and observability) in facilitating or impeding adoption. The theory is useful for understanding the pace and pattern of technology adoption among teachers and institutions in Plateau State.

Empirical Review

A substantial body of empirical research has examined technology integration in Nigerian schools, though most studies focus on secondary and tertiary education. Eze et al. (2018) investigated ICT adoption among secondary school teachers in South-East Nigeria and found that while a majority owned personal devices, classroom integration remained limited due to institutional constraints. Oyelaran and Aiyebelehin (2019) examined technology readiness among primary school teachers in Ogun State and found low levels of digital literacy and minimal training support.

Internationally, Tondeur et al. (2012) conducted a meta-analysis of studies on technology integration and identified teacher training, institutional support, and collaborative culture as the strongest predictors of sustained technology use. Pelgrum (2001) similarly found that inadequate ICT equipment and insufficient teacher training were the most frequently cited barriers across countries. In sub-Saharan Africa, Drent and Meelissen (2008) highlighted the critical role of personal innovativeness and school culture in shaping technology adoption behaviour.

Studies specifically examining Plateau State or the north-central zone of Nigeria in the context of educational technology are limited, creating an important gap that this study addresses. The available literature suggests that public basic schools in north-central Nigeria face particularly acute challenges related to infrastructure deficits and teacher training gaps, consistent with broader patterns of underdevelopment in the region.

While the reviewed literature provides important insights into technology integration in Nigerian schools, significant gaps remain. First, most studies focus on secondary and tertiary institutions, with basic education receiving comparatively little attention. Second, studies focusing specifically on Plateau State and its unique socio-political and infrastructural context are rare. Third, very few studies have examined the intersection of teachers' readiness and institutional capacity simultaneously, making it difficult to identify how these two dimensions interact to shape technology integration outcomes. This study fills these gaps by providing a comprehensive, context-specific empirical investigation.

Methodology

The study adopted a descriptive correlational survey design, which is appropriate for investigating the current state of phenomena involving large groups without manipulation of variables (Fraenkel, Wallen, & Hyun, 2012). This design enabled the collection of quantitative data on teachers' readiness and institutional capacity as they exist in their natural settings, providing a comprehensive snapshot of the current situation in Plateau State basic schools.

The target population comprised all basic school teachers and school administrators in Plateau State, Nigeria. According to the Plateau State Universal Basic Education Board (SUBEB) 2024 database, there are approximately 12,400 registered basic school teachers across 1,047 schools in the state's 17 local government areas. For the purpose of this study, the accessible population was drawn from six strategically selected local government areas representing diverse geographical, socioeconomic, and infrastructural contexts: Jos North, Jos South, Mangu, Shendam, Pankshin, and Barkin Ladi.

A sample of 334 respondents was drawn using stratified random sampling. This technique ensured representation across school type (public and private), location (urban and rural), and LGA. Within each stratum, systematic random sampling was applied to select individual schools and respondents. The sample comprised 288 classroom teachers and 46 school administrators across 60 schools (10 per LGA). The selection was based on the location of the schools (urban and rural, public and private) and population size. The sample size was determined using Yamane's (1967) formula for finite population sampling at a 95% confidence level.

Table 1: Sample Distribution by Local Government Area

Local Government Area	Public Teachers	Private Teachers	Administrators	Total
Jos North	45	20	10	75
Jos South	40	18	9	67
Mangu	35	15	8	58
Shendam	30	12	7	49
Pankshin	28	10	6	44
Barkin Ladi	25	10	6	41
Total	**203**	**85**	**46**	334

Data were collected using a researcher-designed questionnaire titled "Emerging Technology Integration Readiness Scale" (ETIRS). The instrument comprised five sections: (A) demographic information, (B) ICT skills readiness, (C) professional development exposure, (D) institutional infrastructure capacity, and (E) challenges to technology integration.

Sections B through E employed a 4-point Likert-type scale ranging from Strongly Agree (SA) = 4 to Strongly Disagree (SD) = 1. The instrument contained 27 items in total.

Face and content validity were established through expert review by three specialists in educational technology and curriculum studies at the University of Jos. The initial draft of the instrument is 30 items instrument but after the experts reviewed 3 items were drop because it was not relevant. Their feedback was used to revise item wording for clarity and relevance. Reliability was assessed through a pilot study involving 30 teachers from Jos East LGA (not included in the main study), yielding a Cronbach's Alpha coefficient of 0.84, indicating high internal consistency.

Prior to data collection, ethical approval was obtained from Principal of secondary schools selected, and administrative permission was secured from the Plateau State Ministry of Education and SUBEB. Questionnaires were administered by the researcher with the assistance of trained research assistants over a four-week period. The researcher and the assistants were present with the respondents that respond to the questionnaire, This gives high rate of questionnaires administered, all 334 were returned and found usable, giving a 100% response rate.

Quantitative data were analysed using descriptive and inferential statistics. Descriptive statistics including mean scores and percentages were used to answer the research questions. A mean score of 2.50 and above was interpreted as agreement (positive response), while a mean below 2.50 was interpreted as disagreement (negative response). For hypothesis testing, independent samples t-tests and Pearson's Product Moment Correlation were employed. All analyses were conducted using SPSS version 20.0 at a 0.05 level of significance.

Results

Research Question 1: ICT Skills Readiness of Teachers

Table 2: ICT Skills Readiness of Basic School Teachers (N = 334)

Sn	Item	SA	A	D	SD	Mean
1	I can confidently use a computer/laptop for instructional purposes	38%	31%	20%	11%	2.96
2	I use digital tools (e.g., projectors, tablets) in lesson delivery	22%	28%	30%	20%	2.52
3	I am familiar with e-learning platforms (e.g., Google Classroom)	18%	25%	32%	25%	2.36
4	I can create digital lesson plans and teaching materials	20%	27%	30%	23%	2.44
5	I use the internet to access instructional resources regularly	35%	28%	22%	15%	2.83
6	I integrate AI-based tools in my teaching activities	8%	12%	38%	42%	1.86
7	I feel confident adopting new technologies in my classroom	19%	23%	33%	25%	2.36
	Cluster Mean					**2.48**

***Note**: SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree. Decision: Mean ≥ 2.50 = Agree; Mean < 2.50 = Disagree*

Table 2 reveals that the cluster mean for ICT skills readiness was 2.48, marginally below the benchmark of 2.50. Teachers demonstrated moderate competence in basic computer use (mean = 2.96) and internet use for instructional resources (mean = 2.83). However, confidence with advanced tools such as AI-based educational applications was critically low (mean = 1.86), and familiarity with e-learning platforms was below the threshold (mean =

2.36). The results indicate that while teachers possess foundational digital literacy, their readiness for advanced and emerging technology integration remains limited.

Research Question 2: Professional Development Exposure

Table 3: Professional Development Exposure for Technology Integration (N = 334)

Sn	Item	SA	A	D	SD	Mean
8	I have attended ICT/technology training workshops	18%	22%	32%	28%	2.30
9	Training on edtech tools has been provided by my school	12%	18%	38%	32%	2.10
10	I have received training on curriculum-technology integration	10%	16%	40%	34%	2.02
11	Professional development programmes are relevant to my needs	15%	20%	35%	30%	2.20
12	I am motivated to participate in technology training	40%	32%	15%	13%	2.99
13	I engage in self-directed learning of new edtech tools	25%	30%	25%	20%	2.60
	Cluster Mean					**2.37**

Table 3 shows that the cluster mean for professional development was 2.37, below the benchmark of 2.50, indicating inadequate professional development exposure overall. Notably, teachers' personal motivation to learn new edtech tools was high (mean = 2.99), and self-directed learning was moderate (mean = 2.60). However, formal training provided by schools or the Ministry of Education was rated very low (mean = 2.10), and training on curriculum-technology integration was the lowest-rated item (mean = 2.02). This suggests a significant gap between individual motivation and available institutional training support.

Research Question 3: Institutional Capacity

Table 4: Institutional Capacity for Technology Integration (N = 334)

Sn	Item	SA	A	D	SD	Mean
14	My school has functional computers for teaching and learning	10%	18%	35%	37%	2.01
15	Reliable internet access is available in my school	8%	12%	30%	50%	1.78
16	My school has projectors/smart boards in classrooms	7%	13%	32%	48%	1.79
17	There is a technology policy guiding edtech use in my school	15%	20%	30%	35%	2.15
18	School leadership supports technology integration	20%	25%	28%	27%	2.38
19	Funding is available for technology infrastructure in my school	5%	10%	32%	53%	1.67
20	Technical support is available for teachers using edtech tools	8%	15%	32%	45%	1.86
	Cluster Mean					**1.95**

The cluster mean for institutional capacity was 1.95, the lowest of all dimensions assessed, indicating critically deficient institutional support for technology integration. Internet access (mean = 1.78) and technology funding (mean = 1.67) were the most severely inadequate dimensions. The availability of computers (mean = 2.01) and smart boards (mean = 1.79) also fell well below the benchmark. Leadership support showed the highest institutional capacity rating (mean = 2.38), though still below the threshold, suggesting that while school leaders

may be willing, structural and financial constraints significantly impede their ability to provide meaningful technology support.

Research Question 4: Challenges to Technology Integration

Table 5: Challenges to Emerging Technology Integration (N = 334)

Sn	Challenge	SA	A	D	SD	Mean
21	Inadequate electricity supply hinders technology use	62%	25%	8%	5%	3.44
22	Lack of personal devices (computers/tablets) is a barrier	55%	28%	10%	7%	3.31
23	Poor internet connectivity limits digital teaching	58%	27%	9%	6%	3.37
24	Inadequate ICT training opportunities	52%	30%	10%	8%	3.26
25	Overcrowded classrooms make edtech use impractical	45%	30%	15%	10%	3.10
26	Resistance to change among staff	38%	32%	18%	12%	2.96
27	High cost of digital devices and internet data	60%	25%	9%	6%	3.39
	Cluster Mean					**3.26**

Table 5 indicates that all seven challenges were rated above the benchmark (mean > 2.50), confirming that technology integration faces significant obstacles in Plateau State basic schools. Erratic electricity supply was identified as the most critical challenge (mean = 3.44), followed by poor internet connectivity (mean = 3.37) and the high cost of devices and data (mean = 3.39). Lack of personal devices (mean = 3.31) and inadequate ICT training (mean = 3.26) were also highly rated. Resistance to change, while still significant (mean = 2.96), was the least acute of the challenges identified.

Hypotheses Testing

Hypothesis 1

HO_1: There is no significant difference in the ICT skills readiness of teachers in public and private basic schools in Plateau State.

Table 6: *t-test comparison on* ICT skills readiness of teachers in public and private schools

Variable	N	X	SD	Df	t-value	p-value	Decision
Private schools	166	2.71	0.47	332	3.42	0.001	Sig.
Public schools	166	2.33	0.52				

Sig. at 0.05 level of significant

An independent samples t-test was conducted. The results yielded t(332) = 3.42, p = 0.001, which is less than 0.05. The null hypothesis was therefore rejected. Teachers in private schools demonstrated significantly higher ICT skills readiness (M = 2.71, SD = 0.47) compared to those in public schools (M = 2.33, SD = 0.52). This difference may be attributed to the relatively better-equipped environments and more frequent training opportunities in private institutions.

Hypothesis 2

HO_2: There is no significant relationship between teachers' professional development exposure and their technology integration practices. Pearson's correlation analysis revealed a moderate positive and statistically significant relationship between professional development exposure and technology integration practices ($r = 0.58$, $p < 0.001$). The null hypothesis was rejected. This finding supports the notion that structured professional development is a key determinant of teachers' technology integration behaviour.

Hypothesis 3

HO_3: There is no significant difference in the institutional capacity for technology integration between urban and rural basic schools in Plateau State.

Table 7: *t-test comparison* between urban and rural basic schools

Variable	N	X	SD	Df	t-value	p-value	Decision
Urban schools	166	2.24	0.45	332	12.87	0.001	Sig.
Rural schools	166	1.62	0.38				

Sig. at 0.05 level of significant

An independent samples t-test comparing urban ($M = 2.24$, $SD = 0.45$) and rural ($M = 1.62$, $SD = 0.38$) schools yielded $t(332) = 12.87$, $p < 0.001$. The null hypothesis was rejected, confirming a substantial urban-rural divide in institutional capacity for technology integration, with rural schools significantly more disadvantaged.

Discussion of the Findings

The finding that teachers in Plateau State basic schools demonstrate moderate but below-threshold ICT skills readiness (cluster mean = 2.48) is consistent with earlier studies by Eze et al. (2018) and Oyelaran and Aiyebelehin (2019), which found similar patterns of foundational digital literacy coupled with limited advanced skill development among Nigerian teachers. The TPACK framework, which undergirds this study, explains this finding as a gap between technological knowledge and pedagogical-technological integration: while teachers may operate digital devices at a basic level, the application of these tools to enhance subject-specific instruction requires a more sophisticated and contextualised form of knowledge that is currently underdeveloped.

The critically low readiness for AI-based tools (mean = 1.86) reflects a global trend where AI in education is still nascent and uneven, particularly in resource-limited settings. This finding aligns with Selwyn (2019), who cautioned that the promise of AI in education has largely bypassed schools in the Global South, where fundamental digital infrastructure challenges remain unresolved. For Plateau State, this underscores the need to first strengthen foundational digital literacy before accelerating toward AI-integrated instruction.

The contrast between teachers' high personal motivation (mean = 2.99) and the inadequacy of formal institutional training (mean = 2.10) is perhaps the most striking finding of this study. It reveals a systemic failure of the institutional support structure to harness existing teacher motivation. This mirrors findings from Drent and Meelissen (2008) and Tondeur et al. (2012), who identified structured professional development as a critical mediating variable between teacher willingness and actual technology integration. The significant positive correlation ($r = 0.58$) between professional development exposure and technology integration practices further reinforces this finding, suggesting that investing in quality training programmes would yield meaningful improvements in classroom technology use.

The low rating for training in curriculum-technology integration (mean = 2.02) is particularly concerning, as it indicates that even when training does occur, it may not be adequately aligned with the curriculum objectives of basic education. Context-sensitive, curriculum-aligned professional development rather than generic technology training is therefore a priority need.

The critically deficient institutional capacity rating (cluster mean = 1.95) reflects the structural and financial constraints facing public basic education in Plateau State. The finding aligns with Pelgrum's (2001) identification of ICT equipment inadequacy and poor infrastructure as the most pervasive barriers to technology integration globally, and with Agbatogun (2010) and Yusuf and Balogun (2011) who documented similar challenges in Nigerian schools. The significant urban-rural divide (urban M = 2.24 vs. rural M = 1.62) indicates that technology inequity maps closely onto existing socioeconomic and geographic disparities within the state, a finding consistent with broader patterns of educational inequality in Nigeria.

The relatively higher rating for school leadership support (mean = 2.38) provides a basis for optimism: where leaders are willing but structurally constrained, targeted policy interventions and resource allocation can have catalytic effects. This finding supports the argument for decentralised, school-level technology capacity-building strategies supported by state and federal funding frameworks.

The high mean ratings across all seven challenges (cluster mean = 3.26) underscore the severity of the obstacles facing technology integration in Plateau State basic schools. Erratic electricity supply emerges as the foundational challenge, consistent with the broader national energy crisis that has long constrained digital development in Nigeria. Poor internet connectivity and high device costs compound this challenge, creating a technological bottleneck that fundamentally limits the practical utility of any teacher readiness improvements made in isolation.

These findings support Rogers' (2003) Diffusion of Innovations theory, which identifies complexity and low trialability as key inhibitors of innovation adoption. When basic infrastructure is unreliable, teachers' ability to trial and experience the benefits of technology is severely limited, reinforcing resistance and disengagement. Addressing infrastructural challenges is therefore not merely a technical matter but a precondition for building the experiential foundation upon which sustained technology adoption depends.

Conclusions

This study has provided a comprehensive empirical assessment of teachers' readiness and institutional capacity for emerging technology integration in basic education in Plateau State, Nigeria. The evidence consistently points to a landscape characterised by moderate teacher motivation and foundational digital skills, but constrained by inadequate professional development, critically deficient institutional infrastructure, and pervasive challenges related to electricity, internet access, and funding. The urban-rural divide and the public-private gap in technology readiness reveal the compounded nature of educational inequality within the state. The study affirms that technology integration in basic education cannot be advanced through isolated interventions targeting only teachers or only infrastructure. A holistic, systems-level approach that simultaneously addresses teacher training, institutional capacity, policy frameworks, and resource allocation is required. Plateau State has the foundational human capital — motivated, educated teachers — to make meaningful strides in educational technology, provided that the enabling structural conditions are put in place.

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Recommendations

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

1. The Plateau State Government and the Universal Basic Education Commission (UBEC) should prioritise sustained investment in digital infrastructure for public basic schools, including provision of solar-powered electricity systems to overcome the pervasive challenge of erratic power supply, internet connectivity, and affordable ICT devices.
2. The Plateau State Ministry of Education and SUBEB should develop and implement a structured, curriculum-aligned Teacher Digital Competency Programme (TDCP) specifically designed for basic school teachers. Such programmes should be continuous, context-sensitive, and incorporate both foundational ICT literacy and advanced curriculum-technology integration skills aligned with TPACK principles.
3. The State Ministry of Education should develop a comprehensive Emerging Technology Integration Policy Framework for basic education, providing clear guidance on minimum technology standards for schools, acceptable technology use, funding mechanisms, and accountability measures for technology-enabled instruction.
4. Private-public partnerships should be actively pursued to bridge the funding and infrastructure gap in public basic schools. Technology companies, telecommunications providers, and development partners should be engaged to co-invest in school connectivity, device provision, and teacher training.
5. School administrators and educational leaders should be included in technology integration capacity-building programmes, given the critical role of leadership in creating a school culture that is supportive of innovation and technology adoption.

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