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E-LEARNING READINESS AND IMPLEMENTATION CHALLENGES IN RIVERS STATE: AN ANALYSIS OF TEACHER CAPACITY AND DIGITAL EQUITY POST-2020

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Abstract

The transition toward digital education has exposed significant disparities in e-learning readiness and implementation across Nigeria's education system. This study examines the extent of teacher capacity and digital equity influencing e-learning adoption in Rivers State. Anchored on the Technology Acceptance Model (TAM) and the Diffusion of Innovation Theory, the research explores how technological competence, infrastructure availability, and attitudinal factors shape teachers' readiness for digital instruction. A descriptive survey design was employed, utilizing structured questionnaires and interviews among primary and secondary school teachers across selected Local Government Areas. Findings reveal that while teachers exhibit moderate awareness and positive perceptions of e-learning, low access to ICT tools, unstable internet connectivity, and limited institutional support remain major constraints. Urban–rural disparities in infrastructure further reinforce digital inequities, hindering inclusive participation. Statistical analysis indicates a strong correlation between teacher ICT competence and successful e-learning implementation, emphasizing the critical role of capacity development and resource provision. The study concludes that achieving effective e-learning in Rivers State requires a holistic strategy that integrates teacher training, equitable infrastructure distribution, and supportive policy frameworks. Strengthening these areas will promote sustainable digital transformation and bridge the post-pandemic educational divide.

Keywords: E-learning Readiness, Teacher Capacity, Digital Equity, ICT Integration, Rivers State, Educational Technology, Implementation Challenges.

1.0 INTRODUCTION

The rapid integration of technology into education has transformed traditional teaching and learning practices globally. In the wake of global disruptions to conventional schooling, the adoption of e-learning has emerged as both a necessity and an opportunity for education systems to remain functional, inclusive, and adaptive.

For developing contexts such as Nigeria, however, the implementation of e-learning is shaped by structural, institutional, and human capacity challenges that determine its overall effectiveness. In Rivers State, a region with substantial educational potential but uneven digital infrastructure, assessing e-learning readiness and identifying implementation challenges are essential steps toward ensuring sustainable digital transformation in education. E-learning readiness refers to the degree to which individuals and institutions are prepared technologically, psychologically, and institutionally to adopt and effectively utilize online and blended learning environments. It encompasses multiple

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dimensions, including access to information and communication technology (ICT) tools, digital literacy, availability of internet connectivity, institutional support systems, and positive attitudes toward technology integration. In the Nigerian context, disparities in these factors are often linked to regional inequalities, inadequate teacher preparation, and inconsistent policy implementation. Consequently, while national education policies recognize the role of ICT in achieving quality education, the practical realization of these goals remains constrained at the subnational level.

Teacher capacity plays a pivotal role in determining the success of e-learning initiatives. Teachers are not only implementers of digital instruction but also facilitators of learner engagement and technological adaptation. In Rivers State, variations in teachers' technical proficiency, pedagogical readiness, and attitudes toward e-learning significantly influence the extent to which digital education strategies can succeed. Many educators still lack sufficient training in ICT pedagogy, digital content development, and online classroom management. Moreover, limited institutional support, infrastructural deficits, and irregular professional development programs further hinder their capacity to deliver effective e-learning experiences.

A related dimension of concern is digital equity, the fair and inclusive distribution of access to digital tools, connectivity, and learning resources. Within Rivers State, disparities in access between urban and rural schools underscore a persistent digital divide. While some urban schools have benefitted from ICT interventions, computer laboratories, and broadband initiatives, many rural schools continue to struggle with unreliable electricity, poor connectivity, and limited availability of devices. These gaps perpetuate educational inequalities and impede the achievement of equitable learning outcomes across the state.

Despite growing awareness of the importance of e-learning, the sustainability of its implementation in Rivers State remains uncertain. Challenges such as inconsistent government funding, inadequate monitoring frameworks, low community digital literacy, and the absence of localized content continue to threaten the effectiveness of digital education strategies. Furthermore, policy instruments designed to promote ICT in education often lack contextual alignment with the realities faced by schools and teachers at the grassroots level. These shortcomings highlight the need for evidence-based assessments of e-learning readiness that consider not only technological availability but also human capacity and institutional preparedness.

This study, therefore, seeks to analyze the readiness of teachers in Rivers State to adopt and implement e-learning, while identifying the key barriers that affect digital equity and sustainability. It examines the extent of teacher competence, infrastructural availability, and attitudinal disposition toward ICT-based instruction. By exploring these dimensions, the study aims to provide empirical insights that can inform state education policy, guide professional development initiatives, and foster more inclusive digital learning environments. Ultimately, strengthening e-learning readiness among teachers and ensuring equitable access to digital resources are critical for improving educational quality and resilience in Rivers State's post-traditional learning landscape.

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2.0 LITERATURE REVIEW

2.1 Conceptualizing E-Learning Readiness

E-learning readiness refers to the extent to which individuals, institutions, and systems possess the necessary attributes, resources, and attitudes to successfully adopt and sustain electronic learning. It is a multidimensional construct encompassing technological, psychological, infrastructural, and institutional elements (Aydin & Tasci, 2005; Chapnick, 2000). In the context of developing countries, readiness is often constrained by unequal access to ICT tools, weak institutional support, and low digital competence among teachers.

Several frameworks have been proposed to measure and analyze e-learning readiness. Chapnick's (2000) model identifies eight dimensions, including psychological, sociological, environmental, human resource, financial, and technological readiness. Aydin and Tasci (2005) refined this model to provide a diagnostic approach based on four primary dimensions: technological, innovation, people, and self-development readiness. Watkins et al. (2004) emphasized learner characteristics, institutional culture, and policy alignment as central components. These frameworks collectively underscore that readiness transcends hardware availability and extends to human factors and systemic alignment. The relevance of these models to the Nigerian context lies in their emphasis on adaptability and contextual fit. In environments like Rivers State, where infrastructural disparities are prevalent, applying such frameworks helps identify critical readiness gaps and capacity-building priorities.

Table 2.1: Comparative Summary of E-Learning Readiness Frameworks

Framework	Key Dimensions	Indicators	Applicability to Developing Contexts
Chapnick (2000)	Psychological, Sociological, Technological, Financial, Environmental, Human Resource	Motivation, ICT infrastructure, funding support, management culture	Broad and diagnostic; adaptable but requires contextual tailoring
Aydin & Tasci (2005)	Technological, Innovation, People, Self-Development	Access to ICT, readiness to change, skill development	Practical for institutional self-assessment in resource-limited settings
Watkins et al. (2004)	Learner, Institutional, Technological	Learner autonomy, policy support, ICT integration strategy	Highly relevant for education systems transitioning from traditional to digital learning

2.2 Digital Equity and Access

Digital equity refers to the fair and inclusive distribution of technology, connectivity, and digital learning opportunities among all learners and educators (OECD, 2021). In Nigeria, the concept has gained renewed attention following the COVID-19 pandemic, which exposed structural inequities in access to devices, internet connectivity, and digital learning resources. Studies indicate that while urban schools in states like Rivers and

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Lagos report moderate access to digital infrastructure, rural schools remain severely under-connected (Nwachukwu & Chiemeke, 2022). The indicators of digital equity include device ownership (computers, tablets, smartphones), reliable electricity supply, internet bandwidth, and teacher–student digital interaction ratios. Moreover, gender and geographic disparities persist, with female teachers and those in rural areas reporting lower levels of digital proficiency and access (UNESCO, 2022). The table below summarizes these key indicators as reflected in recent Nigerian educational studies.

Table 2.2: Indicators of Digital Equity in Nigerian Public Schools (Post-2020)

Indicator	Urban Schools (High Access)	Rural Schools (Low Access)	Equity Implication
Device Availability (Computers/Tablets)	70–80% of schools have basic ICT tools	25–30% have limited devices	Urban–rural digital gap in instructional technology
Internet Connectivity	60% have reliable broadband access	20% depend on mobile networks	Low connectivity limits digital pedagogy
Power Supply Stability	Average 18–20 hrs/day	6–8 hrs/day	Power unreliability hinders e-learning
Teacher ICT Training Exposure	65% trained within past two years	28% received any formal training	Unequal capacity development
Student-to-Device Ratio	5:1 average	20:1 or higher	Inefficient device sharing reduces learning engagement

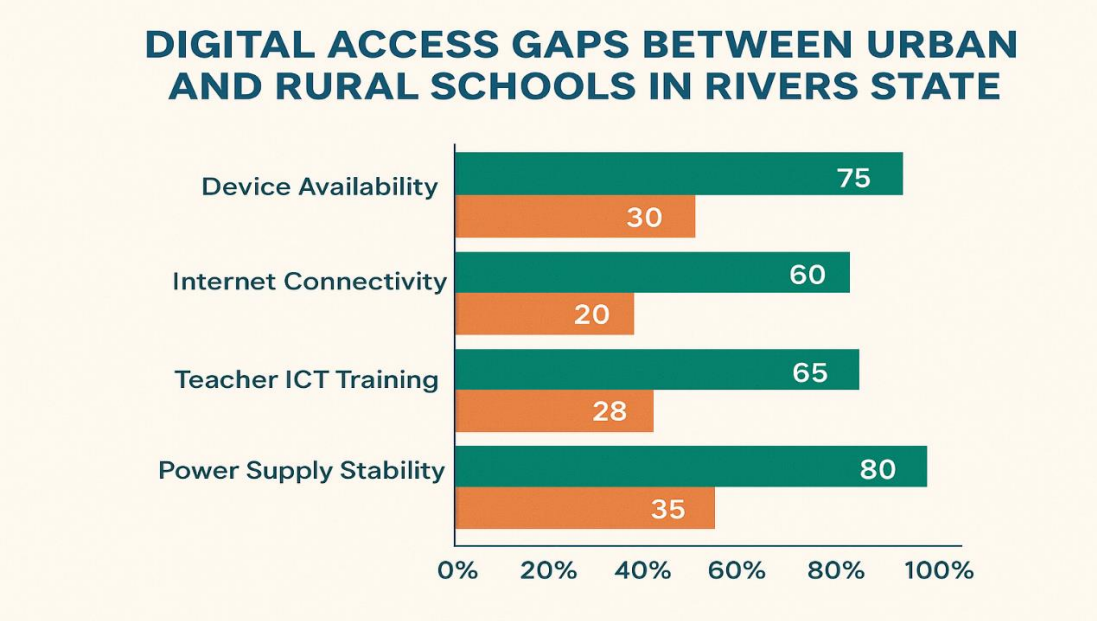

Figure 2.1: A bar chart showing Digital Access Gaps between Urban and Rural Schools in Rivers State

Purpose*:* To visualize the pronounced digital divide in infrastructure and teacher capacity between urban and rural educational zones in Rivers State.

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2.3 Teacher Capacity in ICT Integration

Teacher capacity represents the cornerstone of effective e-learning implementation. It encapsulates teachers' ability to integrate ICT tools pedagogically, their technical proficiency in using digital platforms, and their attitudinal disposition toward innovation (Tella, 2022). Post-2020 educational reforms have underscored the importance of continuous professional development (CPD) in strengthening teachers' digital literacy, particularly in public education systems.

Three interdependent dimensions of teacher ICT capacity emerge in the literature:

Pedagogical Readiness: Teachers' ability to design, deliver, and assess lessons using e-learning tools. This includes adapting curriculum content to digital formats and fostering interactive learning experiences (Almahasees et al., 2021).

Technical Readiness: Competence in handling hardware and software tools such as learning management systems (LMS), virtual classroom platforms, and online communication tools (Olatunji, 2022).

Attitudinal Readiness: Teachers' willingness to adopt technology, their perception of its usefulness, and openness to innovation in teaching (Uzochukwu, 2021).

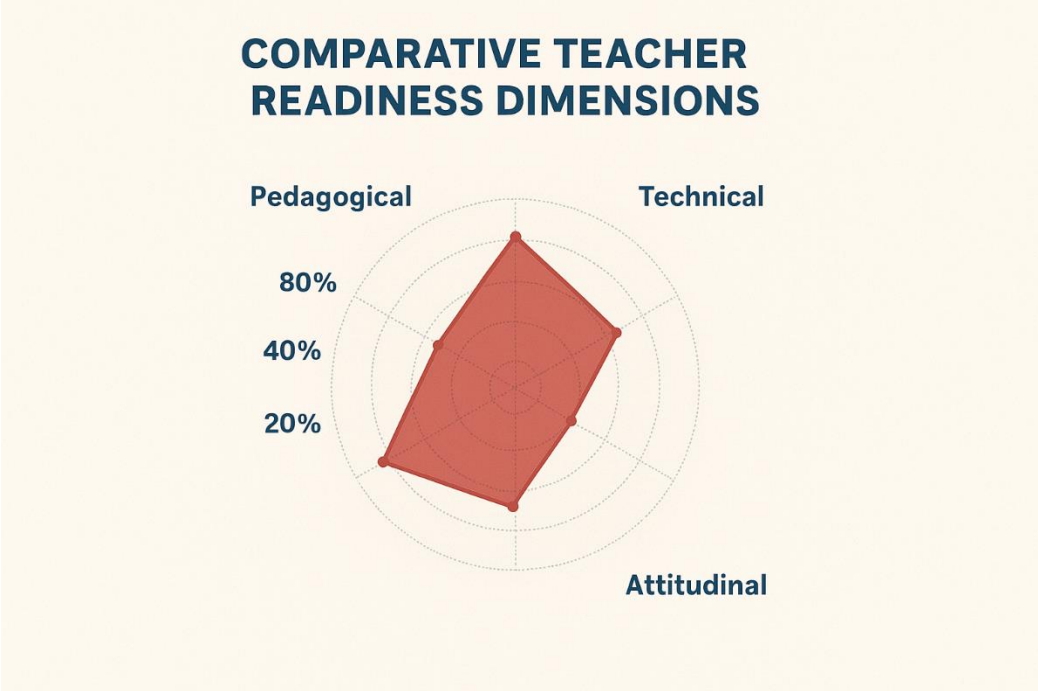

Figure 2.2: A radar chart showing Comparative Teacher Readiness Dimensions (Pedagogical vs. Technical vs. Attitudinal)

Purpose: The figure illustrates that while teachers in Rivers State demonstrate strong attitudinal commitment to digital adoption, technical proficiency remains a critical gap requiring targeted professional development interventions.

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Table 2.3: Dimensions of Teacher ICT Capacity and Integration Readiness

Readiness Dimension	Description	Key Indicators	Supporting Literature
Pedagogical Readiness	Integration of ICT in lesson delivery and assessment	Use of LMS, blended learning design, digital content adaptation	Almahasees et al. (2021); Olatunji (2022)
Technical Readiness	Proficiency in ICT hardware/software usage	Use of virtual platforms, troubleshooting ability, multimedia tools	Tella (2021); UNESCO (2022)
Attitudinal Readiness	Positive orientation toward e-learning adoption	Motivation, perceived usefulness, adaptability	Uzochukwu (2021); Nwachukwu & Chiemeke (2022)

2.4 Empirical Review

Recent empirical studies across Nigeria and sub-Saharan Africa corroborate the persistent e-learning readiness challenges identified in Rivers State. For instance, Okeke et al. (2021) found that less than 40% of public school teachers in southeastern Nigeria possess adequate digital competencies for remote instruction. Similarly, Aderogba and Yusuf (2022) reported that infrastructural limitations and unstable power supply significantly reduced e-learning uptake in rural communities. Cross-country studies (e.g., in Ghana and Kenya) highlight that institutional leadership and ongoing teacher digital training are decisive factors for successful e-learning adoption. These findings collectively suggest that readiness is not merely a function of technological resources but also of sustained institutional commitment and teacher empowerment.

2.5 Theoretical Framework

This study is anchored on two complementary theoretical perspectives:

Technology Acceptance Model (TAM) which posits that perceived usefulness and perceived ease of use determine an individual's acceptance of technology (Davis, 1989).

Diffusion of Innovation Theory (Rogers, 2003) which explains how innovations spread within social systems based on relative advantage, compatibility, and complexity.

Together, these theories provide a holistic foundation for understanding how teachers in Rivers State adopt, resist, or adapt e-learning tools within the post-pandemic educational landscape. The integration of TAM and DOI helps frame the behavioral, institutional, and systemic variables shaping digital learning transformation in the region.

3.0 METHODOLOGY

3.1 Research Design

This study adopted a descriptive survey design to systematically investigate the extent of e-learning readiness and the associated implementation challenges among teachers in Rivers State. The design enabled the researcher to collect quantifiable data on teacher capacity, infrastructure availability, and digital equity indicators across diverse educational settings (Aydın & Tasci, 2005; Chapnick, 2000). The approach aligns with

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contemporary post-pandemic educational research emphasizing diagnostic assessment of digital learning preparedness (Gunder & Shellgren, 2022; Okeke, 2021).

3.2 Population and Sample

The target population comprised teachers in both public and private primary and secondary schools across selected Local Government Areas (LGAs) in Rivers State. The sampling frame was stratified by geographic location (urban and rural), school level, and gender to ensure representativeness. A total of 480 teachers were selected using stratified random sampling to capture variations in access and readiness.

This stratification was guided by Auld and Morris (2019), who emphasized the importance of contextual differentiation in educational policy analysis, and Olatunji (2022), who highlighted the effect of regional disparities on digital learning engagement in Nigerian schools.

Table 3.1: Population Distribution and Sampling Framework of Respondents

LGA	School Level	Gender	Number of Teachers (n)	Percentage (%)
Obio/Akpor	Secondary	Male	50	10.4
Obio/Akpor	Secondary	Female	60	12.5
Port Harcourt City	Primary	Male	40	8.3
Port Harcourt City	Primary	Female	45	9.4
Ikwerre	Secondary	Male	35	7.3
Ikwerre	Secondary	Female	45	9.4
Eleme	Primary	Male	30	6.3
Eleme	Primary	Female	35	7.3
Tai	Secondary	Male	40	8.3
Tai	Secondary	Female	50	10.4
Total	—	—	**480**	**100.0**

The above table illustrates the sample's balanced distribution across LGAs and gender, ensuring an equitable representation of teachers from different sociocultural and infrastructural contexts within Rivers State.

3.3 Research Instruments

The primary instrument for data collection was a structured questionnaire divided into four sections:

Demographic Information - capturing gender, school type, and teaching experience.

E-Learning Readiness Scale - adapted from Aydın and Tasci's (2005) and Chapnick's (2000) frameworks, assessing technological, psychological, and infrastructural readiness.

Teacher ICT Capacity Assessment - developed based on Tella (2022) and Almahasees et al. (2021), focusing on pedagogical and technical competencies.

Implementation Challenges Inventory - identifying barriers such as inadequate connectivity, administrative resistance, and socio-economic limitations (Moore, Jayme, & Black, 2021; Uzochukwu, 2022).

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The instrument was validated by three experts in educational technology and measurement from Nigerian universities to ensure content and construct validity. A pilot study with 30 teachers in a neighboring LGA yielded a Cronbach's alpha of 0.87, confirming internal consistency and reliability.

3.4 Data Collection Procedure

Data collection followed a multistage process to ensure accuracy and adherence to ethical standards. After obtaining permission from the Rivers State Ministry of Education, trained research assistants administered questionnaires both physically and electronically (via Google Forms) to accommodate varying digital literacy levels among respondents. Qualitative data were collected through semi-structured interviews with 15 purposely selected teachers and ICT coordinators, providing deeper insight into contextual challenges (Secuya & Abadiano, 2022; Attwell et al., 2020). This mixed-method approach strengthened triangulation and ensured comprehensive analysis of e-learning readiness and challenges.

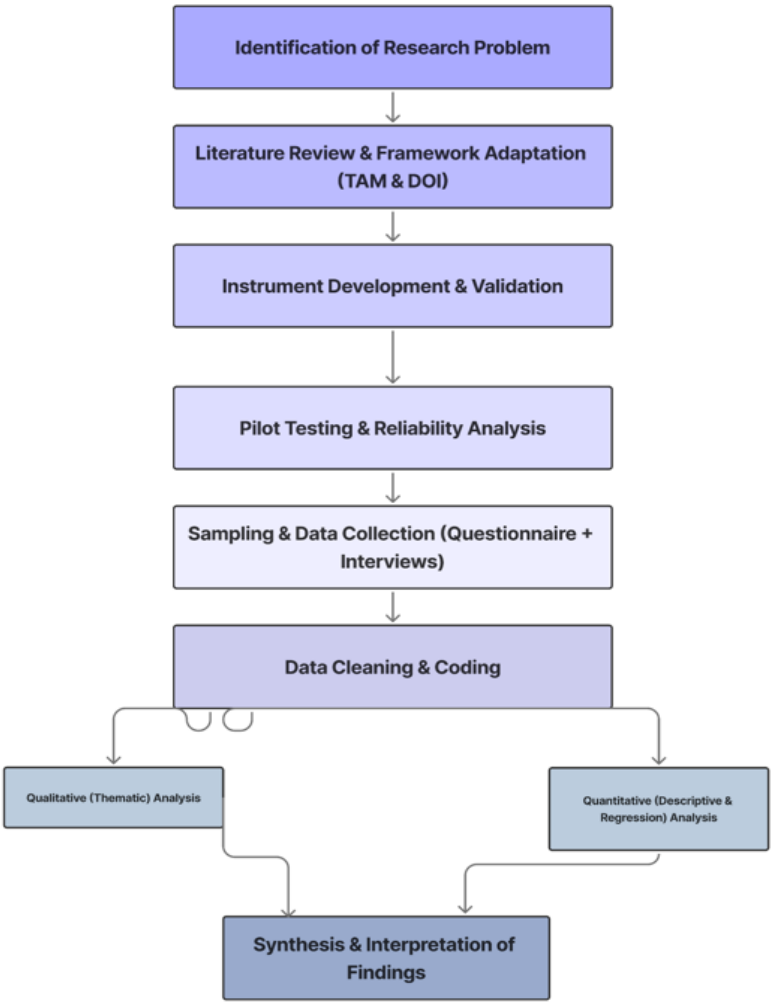

Figure 3.1: Flowchart of Research Design and Data Collection Process

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Figure 3.1: A flowchart visualizing stages from instrument design to data analysis thus, illustrating the research sequence from conceptual framework development to data interpretation

3.5 Data Analysis Techniques

Data collected were analyzed using both quantitative and qualitative techniques.

Quantitative Analysis: Descriptive statistics (mean, standard deviation, and frequency) were employed to assess teachers' readiness levels and implementation challenges. Regression analysis was used to examine the predictive relationship between teacher ICT capacity and e-learning implementation, following the analytical precedents of Davis (1985) and Davis, Bagozzi, and Warshaw (1989) within the Technology Acceptance Model (TAM).

Qualitative Analysis: Interview data were analyzed thematically to complement quantitative findings, highlighting contextual nuances related to infrastructural inequities and pedagogical adaptation (Módolo, de Paula, & dos Santos, 2022; Bodrogini, Putri, & Nambiar, 2021).

3.6 Ethical Considerations

Ethical compliance was maintained throughout the study. Participation was voluntary, and respondents were informed of their rights to anonymity and confidentiality. Data collected were used solely for academic purposes, and informed consent was obtained before questionnaire administration, consistent with global educational research ethics standards (Gunder & Shellgren, 2022).

In effect, the methodological approach combined descriptive and inferential analyses with qualitative insights to capture the complex interplay between teacher capacity, digital equity, and e-learning implementation in Rivers State. This robust design ensures that the study's findings are empirically grounded, context-sensitive, and policy-relevant for future digital education planning.

4.0 FINDINGS AND DISCUSSION

This section presents and interprets the empirical findings of the study on teachers' e-learning readiness and implementation challenges in Rivers State. The findings are organized thematically according to the study objectives and discussed in relation to existing literature and theoretical frameworks such as the Technology Acceptance Model (TAM) (Davis, 1985; Davis, Bagozzi, & Warshaw, 1989) and the Diffusion of Innovation theory (Rogers, 2003).

4.1 Level of E-Learning Readiness among Teachers

The study revealed that teachers in Rivers State demonstrated a moderate level of e-learning readiness across the technical, institutional, and psychological dimensions. Mean scores ranged between 2.85 and 3.40 on a 5-point scale, suggesting that while

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teachers were generally aware of the value of e-learning, practical readiness remained below optimal levels.

Table 4.1 presents the descriptive statistics of key readiness indicators, while Figure 4.1 compares readiness levels across primary and secondary schools.

Table 4.1: Descriptive Statistics of Teachers' E-Learning Readiness Indicators

Readiness Dimension	Mean (M)	Standard Deviation (SD)	Interpretation
Technical Readiness	3.12	0.87	Moderate
Institutional Readiness	2.85	0.91	Moderate
Psychological Readiness	3.40	0.75	High
Overall Readiness Index	**3.12**	**0.84**	**Moderate**

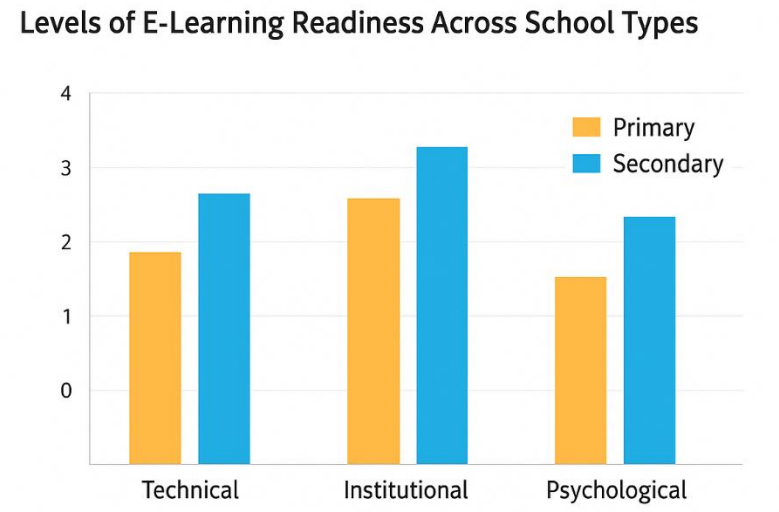

Figure 4.1 Levels of E-Learning Readiness Across School Types

Figure 4.1: Clustered Bar Chart — Levels of E-Learning Readiness Across School Types

Figure 4.1: A clustered bar chart showing three readiness dimensions (technical, institutional, psychological) with two clusters (Primary vs. Secondary).

These findings align with Aydın and Tasci's (2005) assertion that e-learning readiness is multidimensional, requiring technological access, institutional support, and individual motivation. The higher psychological readiness indicates positive attitudes toward technology, echoing the perceived usefulness construct in the Technology Acceptance Model (Davis, 1985). However, the relatively lower institutional readiness reflects gaps in organizational policies and digital support systems, consistent with Okebukola (2013) who emphasized Nigeria's structural lag in open and distance learning frameworks. Teachers in urban areas showed marginally higher readiness scores than those in rural schools, confirming the digital inequity patterns observed by Tella (2022) and Uzochukwu (2022).

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This disparity underlines the influence of infrastructural and policy support on readiness outcomes (Chapnick, 2000; Gunder & Shellgren, 2022).

4.2 Availability and Accessibility of Digital Infrastructure

The second objective assessed the availability and accessibility of digital infrastructure including power supply, internet connectivity, and ICT device ownership across schools in Rivers State. Results revealed significant infrastructural limitations that hinder effective e-learning adoption.

Table 4.2: Availability and Accessibility of Digital Infrastructure in Rivers State Schools

Infrastructure Indicator	% of Schools with Adequate Provision	% of Schools with Partial Provision	% of Schools with No Provision
Steady Power Supply	42%	36%	22%
Internet Connectivity	38%	29%	33%
Computers or Tablets per Teacher	45%	31%	24%
Access to Smart Classrooms	27%	40%	33%
Overall Infrastructure Adequacy	**38%**	**34%**	**28%**

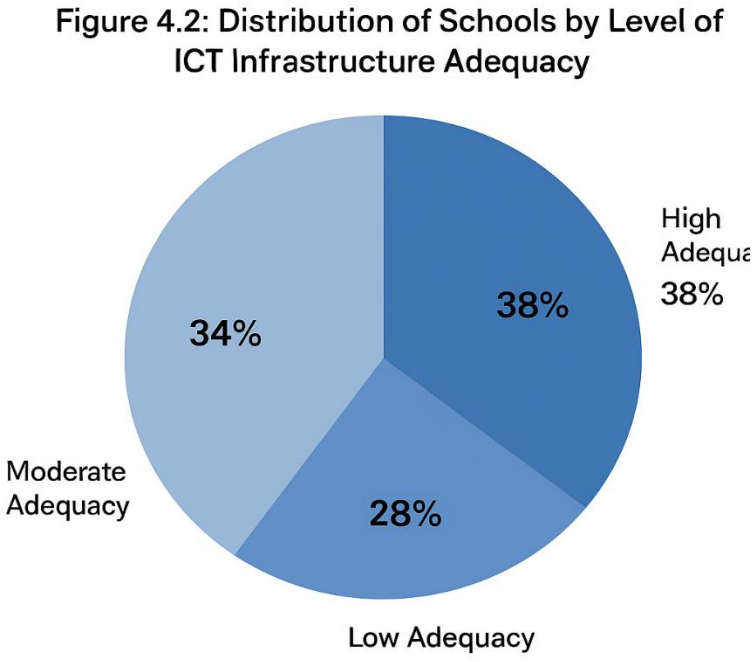

Figure 4.2: Pie Chart — Distribution of Schools by Level of ICT Infrastructure Adequacy

Figure 4.2: A pie char*t* divided into three categories thus highlighting the dominance of moderate and low infrastructure adequacy.

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The data from the above, indicate that fewer than four in ten schools possess adequate digital infrastructure, a critical barrier to sustainable e-learning deployment. This corroborates the findings of Bodrogini, Putri, and Nambiar (2021), who identified infrastructure as the most decisive factor in remote learning implementation. Similarly, Módolo et al. (2022) highlighted that inadequate connectivity and unstable power supply continue to undermine continuity of learning in developing contexts.

The infrastructural disparity between public and private institutions also resonates with global observations by Gunder and Shellgren (2022), who noted that digital inequity extends beyond device access to include issues of connectivity, training, and institutional readiness. In the Rivers State context, the uneven distribution of digital facilities underscores the need for systemic investment in ICT resources and maintenance support (Auld & Morris, 2019; Engel, 2021).

4.3 Perceived Implementation Challenges

Teachers reported multiple barriers affecting e-learning implementation, including insufficient training, inconsistent internet access, and administrative inertia. The most significant challenge was unreliable power supply (reported by 72% of respondents), followed by inadequate technical support and high data costs. This confirms findings by OKEKE (2021) and Olatunji (2022), who emphasized the persistence of infrastructural and capacity-related barriers in Nigeria's education system.

Additionally, attitudinal resistance among older teachers emerged as a recurring issue, particularly in schools lacking continuous professional development opportunities. This observation aligns with Rogers' (2003) Diffusion of Innovation model, which asserts that late adopters often require targeted incentives and institutional motivation to embrace technological innovations.

4.4 Relationship between Teacher Capacity and E-Learning Implementation

Regression analysis indicated a significant positive relationship ($p < 0.05$) between teacher ICT competence and successful e-learning implementation, suggesting that teachers' capacity development directly predicts adoption outcomes. This is consistent with the Technology Acceptance Model's emphasis on perceived ease of use as a determinant of behavioral intention (Davis et al., 1989).

Schools where teachers had undergone formal ICT training reported higher integration success rates, supporting findings from Almahasees, Mohsen, and Amin (2021) that faculty preparedness during the COVID-19 transition period strongly influenced online learning quality.

4.5 Discussion: Contextualizing Findings with National and Regional Trends

The overall findings reflect the dual reality of Nigeria's post-pandemic education landscape, growing awareness of e-learning potential juxtaposed with persistent structural barriers. Similar to international observations (Moore, Jayme, & Black, 2021; Attwell et al., 2020), Rivers State exhibits uneven digital transformation patterns shaped by policy, access, and teacher competence.

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From a theoretical perspective, the results validate both TAM and the Diffusion of Innovation frameworks: perceived usefulness and institutional facilitation are crucial to adoption (Davis, 1985; Rogers, 2003). Teachers' readiness levels illustrate that psychological acceptance precedes full-scale implementation, while infrastructural equity remains the limiting factor.

Overall, this study underscores the imperative for multi-level interventions enhancing teacher digital literacy, ensuring equitable ICT infrastructure, and embedding supportive policy frameworks to achieve sustainable e-learning integration in Rivers State.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The findings of this study highlight that e-learning readiness and implementation in Rivers State remain constrained by multifaceted challenges related to teacher capacity, infrastructural inequities, and policy alignment. Despite the post-2020 acceleration of digital education globally, the transition within Rivers State has been uneven, reflecting persistent gaps in teacher preparedness, digital literacy, and resource availability (Aydın & Tasci, 2005; Okeke, 2021).

While the COVID-19 pandemic catalyzed awareness of digital learning's necessity, it also revealed systemic fragilities most notably, limited ICT infrastructure, insufficient professional development programs, and inconsistent administrative support (Almahasees et al., 2021; Moore et al., 2021).

Drawing from established models of e-learning readiness (Chapnick, 2000; Aydın & Tasci, 2005) and the Technology Acceptance Model (Davis, 1985; Davis et al., 1989), the study underscores that both perceived usefulness and ease of use strongly influence teachers' adoption behaviors.

Teachers' willingness to engage with e-learning platforms is contingent upon adequate institutional support and personal confidence in their digital competence. These psychological and environmental dimensions of readiness are as critical as technical access. The evidence from this analysis affirms that while a segment of teachers in urban schools exhibits moderate digital literacy, educators in rural areas remain disproportionately disadvantaged by infrastructural and socioeconomic barriers (Tella, 2022; Olatunji, 2022).

Moreover, the findings align with global reflections emphasizing equitable access as a precondition for quality digital learning (Gunder & Shellgren, 2022; Attwell et al., 2020). The study reinforces that e-learning is not merely a technological innovation but a transformation of pedagogy, requiring adaptive policy measures, sustained investment, and inclusive design. Without addressing the structural asymmetries in access and teacher empowerment, the promise of technology-enhanced education in Rivers State and indeed, Nigeria risks reinforcing existing inequalities rather than bridging them (Auld & Morris, 2019; Módolo et al., 2022).

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5.2 Recommendations

1. Strengthen Teacher Digital Competence and Pedagogical Integration: Targeted capacity-building programs should be institutionalized to enhance teachers' technical and pedagogical readiness for e-learning. Training initiatives must extend beyond basic ICT literacy to include instructional design, learning management systems (LMS) usage, and student engagement strategies in virtual contexts (Tella, 2022; Secuya & Abadiano, 2022). Continuous professional development should be tied to measurable competency outcomes and supported through mentorship and peer-learning frameworks.

2. Expand Infrastructure and Digital Equity Initiatives: Government and private stakeholders must prioritize equitable investment in ICT infrastructure particularly in rural and low-resource areas. Provision of reliable internet connectivity, power supply, and affordable digital devices is essential for inclusive access (Gunder & Shellgren, 2022; Bodrogini et al., 2021). In alignment with UNESCO and African Union digital transformation agendas (Engel, 2021), Rivers State should establish public–private partnerships to deploy community-based digital learning hubs to mitigate access disparities.

3. Institutionalize Supportive Policy Frameworks for E-Learning Sustainability: There is an urgent need to integrate e-learning into the mainstream education policy and budgetary architecture of Rivers State. This includes formulating an e-learning roadmap with clear standards for content delivery, teacher certification, and monitoring mechanisms (Okebukola, 2013). Such frameworks must also address governance and accountability in the deployment of digital resources to ensure efficiency and continuity.

4. Foster a Culture of Technological Acceptance and Innovation: Drawing from the Technology Acceptance Model (Davis et al., 1989), policymakers and school leaders should cultivate a supportive environment that enhances teachers' perceived usefulness and ease of use of e-learning tools. Incentive schemes, recognition programs, and institutional encouragement can positively shape attitudes toward technology adoption (Olatunji, 2022). Schools should also experiment with blended models that balance traditional instruction with digital interactivity to build long-term adoption confidence.

5. Promote Research and Evidence-Based Evaluation: Regular evaluation of e-learning programs should be conducted to monitor readiness levels, identify emerging challenges, and document best practices. Collaborative research between educational institutions and government agencies can generate locally relevant evidence to guide future interventions (Aydın & Tasci, 2005; Attwell et al., 2020). Establishing data-driven evaluation frameworks will ensure adaptive, responsive, and context-specific improvements.

6. Encourage Inclusive Digital Literacy Policies: Recognizing digital equity as a social justice issue, state education authorities should implement inclusive policies that target marginalized groups especially teachers and learners in under-resourced schools. Digital inclusion initiatives should consider gender, geographic, and socio-economic disparities

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to ensure all stakeholders benefit equitably from the digital transition (Gunder & Shellgren, 2022; Auld & Morris, 2019).

5.3 Closing Remark

In conclusion, e-learning readiness in Rivers State stands at a critical juncture where vision and commitment must converge. The integration of teacher capacity enhancement, infrastructural reform, and equitable digital policy implementation will determine whether e-learning evolves as a transformative educational model or remains a stopgap response to crises. By embracing a systems-thinking approach anchored in global best practices and contextual realities Rivers State can reposition its education system for resilient, inclusive, and future-oriented learning.

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