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MANAGING TEACHER CAPACITY FOR DIGITAL LEARNING AND BRIDGING DIGITAL DIVIDE IN PUBLIC SECONDARY SCHOOLS IN NIGERIA

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Abstract

This study investigated managing teacher capacity for digital learning and bridging digital divide in public secondary schools in Nigeria. It adopted a descriptive survey design. A sample of 400 teachers was selected through stratified random sampling. Data were collected with a structured questionnaire and analysed using mean, standard deviation and Chi-square at 0.05 level of significance. Findings revealed that teacher capacity was significantly low (mean = 2.38) and availability and utilisation of digital resources were significantly low (mean = 2.11). Continuous professional development and mentoring had a significant positive influence (mean = 3.14), while school management support also had a significant positive influence (mean = 2.78). The study concluded that capacity and resources are low, but training, mentoring and management support significantly improve capacity. It recommended provision of infrastructure, regular training, mentoring, management commitment and partnership with stakeholders to bridge the digital divide.

Keywords: Teacher Capacity, Digital Learning, Digital Divide, Professional Development, School Management Support

Introduction

The rapid transformation of education by digital technology has redefined what it means to teach and learn in the twenty first century. Across the world, technology enhanced learning has moved from being an optional innovation to a fundamental requirement for quality education, employability and participation in the knowledge economy. Digital platforms, mobile learning applications, virtual classrooms, educational videos, learning management systems and artificial intelligence tools now shape how knowledge is created, shared and assessed. In this new educational landscape, the teacher remains the most critical factor in determining whether technology truly improves learning or merely becomes an expensive decoration in the classroom. It is the capacity of the teacher, defined by digital literacy, pedagogical competence, confidence, attitude and continuous professional growth that determines the extent to which learners benefit from digital tools. When teachers are well prepared, technology becomes a bridge to wider opportunities. When they are not, the same technology widens the gap between those who have access and those who do not.

In Nigeria, the largest education system in Africa, the promise of digital learning is yet to be fully realised, particularly in public secondary schools. Successive governments have introduced policies and programmes aimed at integrating information and communication technology into education. The National Policy on Information and Communication Technology in Education of 2019, the National Digital Economy Policy and Strategy 2020 to 2030, and the more recent emphasis on digital literacy under the Renewed Hope Agenda all recognise technology as a driver of educational reform and national development. The Universal Basic Education Commission and the Federal Ministry of Education have also invested in computer laboratories, digital content and teacher training initiatives. Despite these efforts, the reality in many public secondary schools, especially those in rural and semi urban communities, remains one of limited access, poor infrastructure and low utilisation. Many schools still operate without functional computers, reliable electricity, internet connectivity or technical support, while a large proportion of teachers continue to rely almost entirely on chalk, textbooks and traditional lecture methods.

The concept of the digital divide in Nigerian education is therefore not simply about the absence of devices. It is a multidimensional problem that involves access divide, skills divide, usage divide and outcome divide. The access divide refers to the unequal distribution of hardware, software and internet facilities between urban and rural schools and between private and public schools. The skills divide refers to the gap in the ability of teachers and learners to use digital tools effectively for teaching and learning. The usage divide concerns the difference between mere possession of technology and its meaningful integration into pedagogy, assessment and collaboration. The outcome divide is the eventual difference in academic achievement, digital competence and future opportunities that results from these earlier gaps. Research has consistently shown that providing

devices without developing teacher capacity does not close these gaps. In fact, schools that receive computers without corresponding training often abandon the equipment, underutilise it or use it only for administrative purposes rather than for instructional delivery (Ojo & Adu, 2023; Eze & Olusola, 2022).

Teacher capacity for digital learning involves more than knowing how to operate a computer or a smartphone. It encompasses technological knowledge, pedagogical knowledge and content knowledge, often described in the literature as the TPACK framework. A teacher who is digitally capable should be able to select appropriate digital resources, design interactive lessons, facilitate online discussion, assess learners using digital tools, ensure safe and ethical use of technology, and adapt instruction to learners with different needs. Studies conducted in Nigeria in recent years have revealed that while many teachers possess basic operational skills such as browsing, using WhatsApp and preparing documents in Microsoft Word, very few possess the higher order pedagogical skills required to integrate technology into subject teaching (Adeyemi & Musa, 2024; Ibrahim et al., 2023). This situation is more pronounced in public secondary schools where training opportunities are irregular, poorly funded and often theoretical rather than practical. Many training programmes focus on computer appreciation rather than classroom application, leaving teachers unable to transfer what they learnt to real teaching situations.

The management of teacher capacity is therefore central to bridging the digital divide. Management in this context refers to the deliberate and systematic process of planning, organising, developing, supporting, supervising and evaluating teachers so that they can effectively use digital tools for learning. It involves school leadership, government policy, professional development structures, mentoring, supervision, motivation and provision of enabling infrastructure. Effective management ensures that training is continuous rather than episodic, that teachers receive follow up support after training, that there are incentives for innovation, and that school principals create a culture that encourages experimentation with technology. Where such management is absent, even willing teachers become frustrated by lack of power supply, absence of internet data, broken devices and lack of recognition. Conversely, where school leaders are supportive and proactive, teachers are more likely to improvise, collaborate, share resources and sustain digital practices despite infrastructural challenges (Nwosu & Obi, 2024; Okonkwo, 2023).

The COVID 19 pandemic further exposed the depth of the digital divide in Nigerian public secondary schools. During school closures, while many private schools in urban centres migrated to online learning through Zoom, Google Classroom and other platforms, most public schools, especially in rural areas, could not sustain any form of digital learning. Learners in those schools were left behind, not because they lacked intelligence or motivation, but because the system had not built the teacher capacity and infrastructure required for continuity. Since then, the Federal Government and various development partners have renewed calls for digital transformation in

education, yet implementation remains uneven. The challenge is no longer whether digital learning is desirable, but how to manage human capacity in a way that makes digital learning workable, sustainable and equitable in resource constrained public schools.

Despite national policies on ICT in education and increasing investment in digital infrastructure, public secondary schools in Nigeria continue to experience a persistent digital divide. Observations and recent empirical studies indicate that many public school teachers lack the pedagogical competence to integrate technology into teaching, even when limited facilities are available. Training programmes are often short, irregular and disconnected from classroom realities. In many schools, computers are locked away, internet facilities are non functional, and teachers are not supervised or encouraged to use technology in lesson delivery. The consequence is that learners in public secondary schools, particularly those in rural communities, graduate without the digital skills required for higher education and the modern workplace, while their counterparts in private and urban schools gain significant advantage. This growing inequality raises a fundamental question about the effectiveness of current approaches to managing teacher capacity for digital learning. If teacher capacity is not deliberately managed through continuous professional development, mentoring, supportive leadership and provision of enabling conditions, the goal of bridging the digital divide will remain unattainable. This study therefore seeks to examine how teacher capacity for digital learning can be effectively managed to bridge the digital divide in public secondary schools in Nigeria.

This study focuses on managing teacher capacity for digital learning and bridging the digital divide in public secondary schools in Nigeria. It covers the dimensions of teacher digital literacy, digital pedagogical competence, access to and utilisation of technology, continuous professional development, mentoring and school management support. The study is limited to public secondary schools, with particular attention to rural and semi urban schools where the digital divide is most severe. It does not cover private schools or tertiary institutions, although lessons from those sectors may be referenced for comparison. Geographically, the study draws on experiences from public secondary schools across Nigeria, recognising the diversity in infrastructure, funding and teacher distribution across states. In terms of content, the study examines how training, leadership, supervision, motivation and infrastructural support influence teachers' ability to use technology for effective teaching and learning.

This study is significant to several stakeholders in the Nigerian education system. To the government and policymakers, it provides evidence based insights on why previous ICT interventions have not fully succeeded and what management strategies are needed to make future investments in digital education more effective. To school principals and administrators, it offers practical guidance on how to plan, support and supervise teachers for technology integration, including the establishment of mentoring systems, school based training and maintenance culture.

To teachers, it highlights the importance of continuous self development and the need to move beyond basic computer literacy to digital pedagogy that improves learner engagement and achievement. To learners, the study is significant because improved teacher capacity translates directly into better access to quality digital learning, improved academic performance and acquisition of twenty first century skills. To researchers and development partners, the study contributes to the growing body of literature on digital transformation in African education and provides a framework for future interventions aimed at equity, inclusion and sustainable educational development in Nigeria.

The study sought to achieve the following specific objectives

1. To examine the level of teacher capacity for digital learning in public secondary schools in Nigeria.

2. To examine the influence of continuous professional development and mentoring on teacher capacity for digital learning in public secondary schools in Nigeria.

3. To examine the influence of school management support on teacher capacity for digital learning in public secondary schools in Nigeria.

In consonance with the specific objectives, the following research questions were formatted to guide this study.

1. What is the level of teacher capacity for digital learning in public secondary schools in Nigeria?

2. What is the influence of continuous professional development and mentoring on teacher capacity for digital learning in public secondary schools in Nigeria?

3. What is the influence of school management support on teacher capacity for digital learning in public secondary schools in Nigeria?

H01: There is no significant difference in the level of teacher capacity for digital learning in public secondary schools in Nigeria.

H02: Continuous professional development and mentoring have no significant influence on teacher capacity for digital learning in public secondary schools in Nigeria.

H03: School management support has no significant influence on teacher capacity for digital learning in public secondary schools in Nigeria.

Literature Review

Concepts

Teacher Capacity

Teacher Capacity refers to the total ability, readiness and competence of a teacher to carry out teaching effectively in a changing educational environment. According to Obizue & Obizue (2025), teacher capacity as the combination of relevant potentials, knowledge, skills, attitudes, confidence, competencies and support systems that enable a teacher to perform effectively in planning, delivering, assessing and managing learning in a technology-inclined setting. It goes beyond academic qualification to include the teacher's knowledge of subject matter, pedagogical skills, digital literacy, confidence, attitude, motivation and ability to adapt to new teaching methods and technologies (Adeyemi & Musa, 2024).

In the context of digital learning, teacher capacity means the ability of a teacher to select appropriate digital tools, design interactive lessons, deliver content using technology, assess learners digitally and manage a technology-driven classroom. A teacher with high capacity does not only know how to operate a computer, but also knows how and when to use it to improve learning outcomes (Ibrahim et al., 2023). Teacher capacity is not static; it is developed and sustained through continuous professional development, mentoring, supervision, experience and supportive school leadership. Where such support is lacking, even qualified teachers may struggle to integrate technology, thereby widening the digital divide in public secondary schools (Nwosu & Obi, 2024; Ojo & Adu, 2023).

Digital Learning

This is the learning that is facilitated, supported or enhanced through the use of digital technology. It involves the use of computers, smartphones, tablets, internet, educational applications, videos, e-books, virtual classrooms and learning management systems to deliver lessons, engage learners, give assignments and assess performance (UNESCO, 2023). Digital learning is not just about using devices in the classroom. It is about changing how learning takes place, from teacher-centred instruction to learner-centred, interactive and flexible learning. Learners can learn at their own pace, access learning materials beyond the classroom, collaborate with peers online and develop critical thinking and problem-solving skills.

In public secondary schools in Nigeria, digital learning includes the use of tools such as WhatsApp for class discussions, YouTube for instructional videos, Google Classroom for assignments, and PowerPoint for lesson presentation. When effectively managed, it helps to bridge the digital divide by giving learners in rural and disadvantaged schools access to quality learning resources that were

previously unavailable to them (Eze & Olusola, 2022; Ibrahim et al., 2023). However, digital learning can only be effective when teachers have the capacity to use it pedagogically and when schools have basic infrastructure such as electricity, internet and devices. Without teacher capacity and management support, digital learning remains a policy intention rather than a classroom reality (Ojo & Adu, 2023).

Bridging the Digital Divide

Eze & Olusola (2022) posited that bridging the digital divide means reducing or closing the gap between those who have access to digital technology and those who do not. In the context of public secondary schools in Nigeria, the divide exists between urban and rural schools, between private and public schools, and between teachers and learners who have digital skills and those who do not. Some schools have computers, internet and trained teachers, while others have none.

Bridging this divide does not mean only sharing or providing devices. It involves providing access to devices and internet, developing teachers' capacity to use technology for teaching, providing electricity and technical support, and ensuring learners can use digital tools to learn effectively. When the divide is bridged, learners in rural and disadvantaged public schools will have the same opportunity to access quality digital learning resources, develop digital skills and compete fairly with their counterparts in urban and private schools (Ojo & Adu, 2023; Nwosu & Obi, 2024).

Theoretical Review

This study adopted two relevant theories; the diffusion of Innovation and the technology acceptance theories

Diffusion of Innovations Theory - Rogers (2003)

This theory explains how new ideas and technologies spread and are adopted by people over time. Rogers argues that adoption does not happen at once. Some people adopt early, while others adopt late. In this study, digital learning is the innovation. Some teachers adopt it quickly because they are confident, trained and supported, while others resist because of fear, lack of skills, poor electricity or lack of devices. The theory shows that for digital learning to spread in public secondary schools, there must be training, demonstration, mentoring, leadership support and evidence that the technology is useful and easy to use. It also explains why the digital divide persists when adoption is left unmanaged.

Technology Acceptance Model (TAM) - Davis (1989)

This theory explains why people accept or reject technology. According to Davis, two factors determine acceptance: Perceived Usefulness and Perceived Ease of Use.

Perceived usefulness means the teacher believes that digital learning will improve teaching and learners' performance. Perceived ease of use means the teacher believes that using the technology will not be difficult or stressful. In public secondary schools in Nigeria, many teachers will not use digital tools if they think the tools are complicated, time-consuming or not useful for their subjects. But if they are trained, mentored and provided with simple tools, internet and support, they will see digital learning as useful and easy, and they will use it regularly. This will help to bridge the digital divide.

Together, these two theories show that bridging the digital divide requires both managing the process of adoption and making teachers see digital learning as useful and easy to use.

Empirical studies,

Adebayo, Yusuf & Balogun (2021) studied ICT competence of secondary school teachers in Oyo State. They surveyed 250 teachers and found that teachers had moderate computer skills but low ability to use ICT for lesson delivery. The study concluded that training should focus on classroom use, not just computer operation.

Okoro & Nwankwo (2020) examined access to digital facilities in rural public secondary schools in Enugu State. Using questionnaire data from 300 teachers, they found that over 70% of the schools had no functional computer laboratory or internet. They concluded that lack of infrastructure is a major barrier to bridging the digital divide.

Bello & Suleiman (2022) investigated continuous professional development and teachers' use of digital tools in Kano State. Their study of 180 teachers revealed that teachers who attended regular workshops and mentoring used digital tools more frequently and confidently than those who did not. The study recommended school-based mentoring.

Chukwu, Eze & Adamu (2025) assessed school leadership support and technology integration in public secondary schools in Benue State. They found a significant positive relationship between supportive principals, provision of solar power and teachers' use of technology for teaching. The study concluded that leadership and basic infrastructure are key to sustaining digital learning.

Methodology

This study adopted a descriptive survey research design. The population consisted of teachers in public secondary schools in Nigeria, from which a sample of 400 teachers was selected using simple random sampling technique. Data were collected using a structured questionnaire titled Managing Teacher Capacity for Digital Learning and Bridging Digital Divide Questionnaire. The questionnaire was validated by experts and its reliability was established through a pilot test. For data analysis, mean and standard deviation were used to answer the research questions. A criterion mean of 2.50 was used as the benchmark for agreement. Any item with a mean of 2.50 and above was accepted, while any item below 2.50 was rejected. Chi-square was used to test the hypotheses at 0.05 level of significance. Where the calculated chi-square value was greater than the critical value, the null hypothesis was rejected, and where it was less, the null hypothesis was accepted.

Results

Results are presented according to the four research questions and the four hypotheses. Mean and standard deviation were used to answer the research questions, while Chi-square was used to test the hypotheses at 0.05 level of significance. The criterion mean is 2.50. N = 400 teachers.

Research Question 1: Level of Teacher Capacity for Digital Learning

S/N	Item	Mean	SD	Decision
1	Teachers can operate computers and smartphones for teaching	2.78	0.84	Accepted
2	Teachers can use internet to search for teaching materials	2.65	0.91	Accepted
3	Teachers can prepare lessons using PowerPoint and other digital tools	2.31	0.88	Rejected
4	Teachers can use learning management systems like Google Classroom	2.04	0.79	Rejected
5	Teachers can use digital tools to assess and give feedback to learners	2.18	0.82	Rejected
6	Teachers are confident in integrating technology into			

	classroom teaching	2.29	0.86	Rejected
	Grand Mean	**2.38**	**0.85**	**Low**

The grand mean of 2.38 is below the criterion mean of 2.50, which shows that the level of teacher capacity for digital learning in public secondary schools in Nigeria is low. Teachers have basic skills in operating devices and searching the internet, but they lack capacity in lesson preparation with digital tools, use of learning management systems, digital assessment and confident integration of technology into teaching.

Research Question 2: Influence of Continuous Professional Development and Mentoring on Teacher Capacity

S/N	Item	Mean	SD	Decision
1	Workshops improve teachers' skills in using digital tools	3.24	0.71	Accepted
2	Mentoring helps teachers to apply digital learning in the classroom	3.18	0.74	Accepted
3	Regular training increases teachers' confidence in using technology	3.31	0.68	Accepted
4	Peer support among teachers improves digital skills	3.05	0.77	Accepted
5	In-service training exposes teachers to new digital tools	2.94	0.80	Accepted
	Grand Mean	**3.14**	**0.74**	**High**

The grand mean of 3.14 is above the criterion mean of 2.50, which shows that continuous professional development and mentoring have a high positive influence on teacher capacity for digital learning. Workshops, mentoring, regular training and peer support improve teachers' skills, confidence and ability to apply digital tools in classroom teaching.

Research Question 3: Influence of School Management Support on Teacher Capacity

S/N	Item	Mean	SD	Decision
1	Principals encourage teachers to use digital tools	3.02	0.78	Accepted
2	School management provides devices and internet for teaching	2.48	0.91	Rejected
1	School management provides technical support when devices fail	2.61	0.87	Accepted
4	School management includes digital learning in school plans	2.92	0.82	Accepted
5	School management provides time and incentives for digital training	2.89	0.85	Accepted
	Grand Mean	**2.78**	**0.85**	**Moderate/High**

The grand mean of 2.78 is above the criterion mean of 2.50, which shows that school management support has a positive influence on teacher capacity for digital learning. Management encouragement, planning and technical support improve capacity. However, provision of devices and internet remains weak, with a mean of 2.48, which limits the full effect of management support.

Test of Hypotheses

Hypothesis 1: Level of Teacher Capacity

Test	DF	Calculated X2	Critical X2	P Value	Decision
Chi-Square	3	18.42	7.82	0.00	Rejected

The calculated Chi-square value of 18.42 is greater than the critical value of 7.82 and p value of 0.00 is less than the 0.05 level of significance. Therefore, the null hypothesis is rejected. This

means there is a significant difference in the level of teacher capacity for digital learning, and the level is significantly low.

Hypothesis 2: Continuous Professional Development and Mentoring

Test	DF	Calculated X2	Critical X2	P Value	Decision
Chi-Square	9	34.58	16.92	0.00	Rejected

The calculated Chi-square value of 34.58 is greater than the critical value of 16.92 at 0.05 level of significance. Therefore, the null hypothesis is rejected. This means continuous professional development and mentoring have a significant influence on teacher capacity for digital learning.

Hypothesis 3: School Management Support

Test	DF	Calculated X2	Critical X2	P Value	Decision
Chi-Square	9	29.84	16.92	0.00	Rejected

The calculated Chi-square value of 29.84 is greater than the critical value of 16.92. The p value is lower than 0.05 level of significance giving credence for the rejection of the null hypothesis. This means school management support has a significant influence on teacher capacity for digital learning.

Discussion of Findings

The finding that teacher capacity is low (grand mean = 2.38) agrees with Adebayo et al. (2021) who found teachers had basic computer skills but lacked ability to use ICT for lesson delivery. It supports TAM (Davis, 1989), because teachers who find technology difficult will not use it confidently. The corresponding hypothesis one was rejected on the ground that there is a significant difference in teacher capacity, and the level is significantly low. This agrees with Adebayo et al. (2021) that teachers lack classroom application of ICT, and supports TAM that difficulty in use limits adoption. The result can be attributed to the fact that teachers can operate devices and search the internet, but cannot use LMS, digital assessment or integrate technology confidently

Continuous professional development and mentoring have a significant positive influence on teacher capacity. The high influence (grand mean = 3.14) agrees with Bello & Suleiman (2022) who found that teachers who attended workshops and mentoring used digital tools more confidently. It also supports Rogers (2003) in his assertion that training and demonstration speed up adoption of innovation. Workshops, mentoring and peer support improve skills and confidence.

School Management Support also exerted positive influence due to the grand mean of 2.78 and this aligns with Chukwu et al. (2025) who found supportive principals improve technology integration. However, provision of devices and internet was still weak (mean = 2.48), which limits the full effect of management support.

In summary, capacity is low, but training, mentoring and management support significantly improve teacher capacity for digital learning and help bridge the digital divide.

Conclusion

The study concluded that teacher capacity for digital learning and the availability and utilisation of digital resources in public secondary schools in Nigeria are significantly low, which widens the digital divide. It also concluded that continuous professional development, mentoring and school management support have a significant positive on teacher capacity for digital learning. Therefore, bridging the digital divide requires sustained investment in infrastructure, regular training, mentoring and committed management support.

Recommendations

1. Government and school authorities should provide computers, projectors, internet facilities and steady power supply to public secondary schools to improve access to digital learning.

2. Ministries of Education should organise regular workshops, seminars and in-service training on digital pedagogy, learning management systems and digital assessment for teachers.

3. Schools should establish mentoring and peer support systems where digitally skilled teachers guide and support less skilled colleagues.

4. School management should include digital learning in school development plans, provide technical support and motivate teachers who use digital tools in teaching.

5. Government and stakeholders should create partnerships with private organisations and NGOs to fund digital infrastructure, maintenance and continuous capacity building for teachers.

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