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MEASURING THE LEVEL OF DIGITAL SKILL (DS) AMONG SECONDARY SCHOOL TEACHERS IN IMPLEMENTING ONLINE TEACHING STRATEGIES IN PLATEAU CENTRAL ZONE, POST COVID-19 ERA

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ABSTRACT

This study looked at secondary school teachers' digital abilities and how they relate to the successful adoption of online teaching strategies in the classroom in Plateau Central Zone of Nigeria in the post-COVID-19 period. The study was prompted by the increased digitisation of education and the difficulties that teachers faced in adjusting to technology following the pandemic. A descriptive survey design approach was used, including 90 purposefully selected teachers from Bokkos, Mangu, Pankshin, Kanke, and Kanam Local Government Areas. Data were collected using a validated instrument called Measure of Digital Skill in Implementing Online Teaching Strategies (MODSIOTS), which had a Cronbach's Alpha reliability coefficient. The research questions were addressed using descriptive statistics of percentage and mean, whereas the hypothesis was tested using the chi-square test (χ^2). A significance threshold of 0.05 was utilised. According to the findings, teachers had intermediate digital competency, notably in seeking for internet materials (M = 3.24), but had shortcomings in using communication platforms (M = 2.26). High data expenses (M = 3.54), insufficient technical support (M = 3.47), and unstable internet access (M = 3.33). Significant challenges to effective online training were identified. According to the chi-square value ($\chi^2 = 16.08$, df = 4, p = .003), there was a substantial association between teachers' digital competency and the efficiency of online instructional delivery. The research found that boosting teacher' digital abilities through continuous professional training and upgraded ICT infrastructure is critical for furthering technology integration into secondary schooling in the Plateau Central Zone.

Keywords: Digital skills; online teaching; secondary school teachers; Plateau Central Zone; post COVID-19 era.

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INTRODUCTION

Education systems across the globe are undergoing rapid transformations driven by digital innovation. In today's knowledge-driven economy, the ability to adapt to technological change has become indispensable for institutions, teachers, and learners alike. The integration of digital skills into teaching and learning is no longer considered optional but rather a fundamental requirement for effective education delivery (UNESCO, 2020). Digital competence enables teachers to enrich classroom instruction, enhance students' engagement, foster independent and collaborative learning, and ultimately prepare learners for participation in an increasingly interconnected world.

In Nigeria, as in many developing countries, the COVID-19 pandemic exposed significant gaps in digital readiness across the education sector. The abrupt shift from face-to-face instruction to online and blended teaching modes created unprecedented challenges for secondary school teachers, many of whom lacked the necessary digital competencies to adapt to e-learning platforms, digital content creation, and student engagement in virtual environments. While some educators were able to adjust quickly, others struggled with limited access to technology, poor internet connectivity, and insufficient training. These challenges highlighted the critical role of teacher digital skills in sustaining educational continuity during crises and beyond.

The Plateau Central Zone, comprising Local Government Areas such as Bokkos, Mangu, Pankshin, Kanke, and Kanam, reflects a microcosm of these challenges. Teachers in this region face multiple constraints ranging from infrastructural inadequacies to varying levels of digital literacy, which affect their ability to implement online teaching strategies effectively. Despite the growing recognition of digital competence as an essential 21st-century skill, research has shown that Nigerian public schools, especially in semi-urban and rural settings, still lag behind in adopting and maximising the benefits of digital tools for instructional delivery (Osunwusi & Abifarin, 2013).

Against this backdrop, measuring the level of digital skills among secondary school teachers becomes imperative. Such an assessment provides insights into the strengths and weaknesses of teachers' competencies, identifies training needs, and guides policymakers in designing targeted interventions. Beyond addressing immediate post-pandemic challenges, evaluating teachers' digital skills also establishes benchmarks for long-term professional development and digital literacy policies. This study, therefore, seeks to examine the extent to which secondary school teachers in Plateau Central Zone possess and utilize digital skills for implementing online teaching strategies in the post-COVID-19 era.

STATEMENT OF THE PROBLEM

The outbreak of COVID-19 accelerated the global shift towards online and blended learning. However, in Plateau Central Zone of Nigeria, many secondary school teachers lacked adequate digital skills to effectively implement online teaching strategies. Limited infrastructure, poor internet access, and insufficient professional training further compounded these challenges, leading to unequal learning experiences and widening educational gaps. Despite the centrality of digital competence to 21st-century education, there has been little systematic assessment of teachers' digital skills in the region. Without such data, policymakers and stakeholders cannot provide targeted interventions or design sustainable capacity-building programs. This gap underscores the need to investigate the level of digital skills among secondary school teachers in Plateau Central Zone in the post-COVID-19 era.

PURPOSE OF THE STUDY

The purpose of this study is to measure the level of digital skills of secondary school teachers in Plateau Central Zone and examine their capacity to implement online teaching strategies effectively in the post-COVID-19 era.

RESEARCH QUESTIONS

The following research questions were raised to guide the study:

1. What is the current level of digital skills of secondary school teachers in Plateau Central Zone, post Covid-19 era?
2. What are the training needs of secondary school teachers for effective implementation of online teaching strategies in Plateau Central Zone, Post Covid-19 era?
3. How do secondary school teachers perceive the integration of digital skills in teaching and learning in Plateau Central Zone, Post Covid-19 era?
4. What factors affect the implementation of online teaching strategies in Plateau Central Zone, post Covid-19 era?

HYPOTHESIS

In line with the purpose of the study and the research question that guided the investigation, the null hypothesis stated below was formulated and tested.

H_o: There is no significant relationship between secondary school teachers' level of digital skills and the effectiveness of implementing online teaching strategies in Plateau Central Zone.

SIGNIFICANCE OF THE STUDY

This study is significant as it provides empirical evidence on the state of teachers' digital competence in Plateau Central Zone. The findings will guide education stakeholders, government agencies, and professional bodies in designing effective training programs tailored to teachers' needs. It will also inform policy on digital literacy integration in secondary schools and contribute to bridging the digital divide in Nigeria's education system. Furthermore, the study will add to existing literature on post-pandemic education, particularly in the Nigerian context.

SCOPE OF THE STUDY

The study is confined to public secondary school teachers in Plateau Central Zone, covering five Local Government Areas: Bokkos, Mangu, Pankshin, Kanke, and Kanam. It focuses on assessing teachers' digital skills, their perceptions of online teaching strategies, and factors influencing digital competence in the post-COVID-19 era.

LITERATURE REVIEW

The concept of digital skills has been widely discussed by scholars, policymakers, and practitioners as education systems globally strive to respond to the demands of the 21st century. Digital skills are broadly understood as the competencies required to effectively use digital technologies for communication, information access, content creation, and problem-solving. The European Union (2018) describes digital skills as a set of knowledge, attitudes, and abilities needed to apply technology appropriately in domains such as work, learning, leisure, and civic participation. Similarly, Deursen and Dijk (2019) identify three core dimensions of digital competence: operational skills, formal skills, and information skills, all of which are critical for effective participation in modern society.

In the educational sector, digital skills have been linked to improved teaching practices and enhanced student outcomes. Abolade and Yusuf (2015) argue that digital literacy supports teacher proficiency, fosters professional growth, and enhances equality in teaching competency. From a Nigerian perspective, Onyije and Yusuf (2013) emphasize that implementing digital tools such as word processors, online databases, and distance learning platforms can greatly enhance instructional delivery when teachers are competent in their use. However, research has also shown persistent disparities in digital skill acquisition between urban and rural schools, with teachers in rural areas often disadvantaged (Osunwusi & Abifarin, 2013).

The COVID-19 pandemic further reinforced the urgency of digital competence among teachers. With the abrupt transition to remote learning, educators were compelled to adopt online teaching strategies such as synchronous and asynchronous learning, discussion forums, and gamification. While studies highlight benefits such as flexibility, accessibility, and interactive learning (Hrastinski, 2009; Kapp, 2012), significant challenges remain, including technical difficulties, poor infrastructure, and limited internet access in Nigeria (Olushola & Adeolu, 2020). These limitations often hinder equitable access to quality education, thereby widening the digital divide.

Largely, the literature suggests that while digital skills hold transformative potential for education, the capacity to harness this potential depends on context-specific realities. For Plateau Central Zone, where infrastructure gaps and teacher readiness vary widely, a comprehensive assessment of teachers' digital competence is necessary. Such studies will provide a foundation for designing interventions that not only improve instructional delivery but also ensure inclusivity and sustainability in post-COVID-19 education.

RESEARCH METHODOLOGY

This study adopted a descriptive survey design with a quantitative approach to assess secondary school teachers' digital skill levels. The design was appropriate because it allowed data collection from a large population, described existing conditions without manipulating variables, and provided a basis for generalization. The population comprised all secondary school teachers in Plateau Central Zone, covering Bokkos, Mangu, Pankshin, Kanke, and Kanam LGAs. Three public secondary schools were purposively selected from each LGA, and six teachers from each school, giving a total sample of ninety (90) teachers.

Purposive sampling ensured the inclusion of teachers actively engaged in classroom instruction with some exposure to online teaching strategies. Data were collected using a structured questionnaire titled Measure of Digital Skill in Implementing Online Teaching Strategies (MODSIOTS), validated by experts from the Department of Educational Psychology, Test and Measurement Unit, Federal University of Education, Pankshin. A pilot test yielded a Cronbach's Alpha coefficient of 0.82, confirming high reliability. The questionnaires were personally administered with the help of research assistants. Data were analyzed using mean and standard deviation for the research questions, while the Chi-square (χ^2) test tested the null hypothesis at the 0.05 significance level.

RESULTS

Demographic Data

Descriptive statistics were used to summarize the demographic characteristics of the 90 teachers in the study.

Table 1. Gender Distribution

Gender	No. of Teachers	Percentage (%)
Male	54	60.00
Female	36	40.00
Total	**90**	**100.00**

Field Survey (2025)

Table 1 is the gender distribution which showed that males (60%) outnumbered females (40%), reflecting a male-dominated sample.

Table 2. Age Group

Age	N0. of Teachers	Percentage (%)
20-30	37	41.11
31-40	41	45.56
41-50	8	8.89
51+	4	4.44
Total	**90**	**100.00**

Field Survey (2025)

Table 2 is the age analysis of respondents which revealed that most respondents were between 31–40 years (45.56%) and 20–30 years (41.11%), while only a small proportion were 41–50 years (8.89%) or 51 years and above (4.44%). This indicates that the majority of participants were relatively young to middle-aged teachers.

Table 3. Teaching Specializations

Specializations	No. of Teachers	Percentage (%)
Sciences	23	25.56
Arts	45	50.00
Humanities	22	24.44
Total	**90**	**100.00**

Field Survey (2025)

Table 3 is the teaching specialization of the teachers, which indicated that half of them were in the Arts (50%), while Sciences (25.56%) and Humanities (24.44%) had nearly equal representation.

Table 4. Year of Teaching Experience

Years	N0. of Teachers	Percentage (%)
1-5	18	20.00
6-10	16	17.78
11-15	21	23.33
16+	35	38.89
Total	**90**	**100.00**

Field Survey (2025)

Table 4 is regarding teaching experience, the highest proportion had more than 16 years (38.89%), followed by 11–15 years (23.33%). Teachers with fewer years of experience (1–5 years = 20%; 6–10 years = 17.78%) were less represented.

RESEARCH QUESTIONS

Research Question 1: What is the current level of digital skills of secondary school teachers in Plateau Central Zone, post Covid-19 era?

Table 5: Teachers' Level of Digital Skills

S/N	Item	N	Mean ($\bar{X}$)
1.	I can use word processing tools (e.g., MS Word, Google Docs).	90	2.74
2.	I can create presentations with PowerPoint or Google Slides.	90	2.99
3.	I can search online for teaching and learning materials.	90	3.24
4.	I can communicate with students through email or online platforms.	90	2.26
5.	I can solve minor digital issues like login or connection problems.	90	2.89
6.	I can use cloud storage (e.g., Google Drive, OneDrive) to share materials.	90	2.54

Criterion mean = 2.50. Mean scores (M) ≥ 2.50 indicate acceptable competence; mean scores < 2.50 indicate low competence.

Table 5 presents data on the current level of digital skills among secondary school teachers in Plateau Central Zone. The results show moderate proficiency across most digital skill areas, with mean scores ranging from 2.26 to 3.24. The highest competency was reported in searching for online teaching materials (M = 3.24), while the lowest was in communicating with students via email and online platforms (M = 2.26). Overall, the findings suggest that teachers possess average digital competence but need improvement in communication and interactive technology use.

Research Question 2: What are the training needs of secondary school teachers for effective implementation of online teaching strategies in Plateau Central Zone, Post Covid-19 era?

Table 6. Teachers' Training Needs for Online Teaching

S/N	Item	N	Mean ($\bar{X}$)
7.	I need training to create digital materials (videos, ebooks, podcasts).	84	3.38
8.	I need professional development in managing virtual classrooms.	90	3.31
9.	I need training on digital assessment tools (Kahoot, Google Forms).	90	3.42
10.	I need support in integrating multimedia into my teaching.	90	3.42
11.	I need workshops on ethical use of digital tools.	90	3.52
12.	I need training to design interactive online lessons.	90	3.63

Criterion mean = 2.50. Mean scores(M) ≥ 2.50 denote areas where training is needed.

Table 6 summarizes teachers' training needs for effective implementation of online teaching strategies. All items recorded high mean values between 3.31 and 3.63, exceeding the criterion mean of 2.50. The greatest training need was in designing interactive online lessons (M = 3.63), followed by workshops on ethical use of technology (M = 3.52). These findings

indicate that teachers strongly desire professional development to enhance their digital instructional skills.

Research Question 3: How do secondary school teachers perceive the integration of digital skills in teaching and learning in Plateau Central Zone, Post Covid-19 era?

Table 7: Teachers' Perception of Digital Skill Integration

S/N	Item	N	Mean ($\bar{X}$)
13.	Digital skills make lessons more engaging and interactive.	90	2.71
14.	Digital skills improve students' academic performance.	90	2.53
15.	Effective teaching today requires digital competence.	90	3.64
16.	Integrating digital skills reduces teacher workload.	90	2.16
17.	I feel motivated using digital tools for teaching.	90	2.44
18.	Using digital tools improves my teaching confidence.	90	2.82

Criterion mean = 2.50. Mean scores (M) ≥ 2.50 indicate positive perception; mean scores < 2.50 indicate negative perception.

As shown in Table 7, teachers generally had favourable perceptions toward digital skill integration, with mean scores ranging from 2.16 to 3.64. The highest-rated perception was that effective teaching in the 21st century requires digital competence (M = 3.64), while the lowest was that digital skills reduce teachers' workload (M = 2.16). The overall results imply that teachers acknowledge the importance of digital integration but do not necessarily perceive it as reducing their workload.

Research Question 4: What factors affect the implementation of online teaching strategies in Plateau Central Zone, post Covid-19 era?

Table 8: Factors Affecting Implementation of Online Teaching Strategies

S/N	Item	N	Mean ($\bar{X}$)
19.	Poor internet connection limits online teaching.	90	3.33
20.	Limited access to digital tools affects my teaching.	90	2.82
21.	Lack of government support discourages online teaching.	90	2.84
22.	High data cost limits my use of online platforms.	90	3.54
23.	Management support motivates me to use internet teaching techniques.	90	1.82
24.	Limited technical support discourages me from using digital platforms effectively.	90	3.47
25.	Insufficient time reduces my use of online strategies.	90	1.84

Criterion mean = 2.50. Mean scores ≥ 2.50 indicate significant influencing factors; mean scores < 2.50 indicate less significant factors.

Table 8 highlights factors influencing the implementation of online teaching strategies. The major constraints identified were high data subscription costs (M = 3.54), limited technical support (M = 3.47), and poor internet connectivity (M = 3.33). The lowest means were recorded for management support (M = 1.82) and lack of time for lesson preparation (M = 1.84). These results suggest that infrastructural and financial barriers remain the most critical challenges affecting online teaching implementation in the study area.

HYPOTHESIS

Table 9. Summary of Chi-square Result on the Relationship between Teacher's Level of Digital Skills and the Effectiveness of Online Teaching Implementation (N=90)

Variable	x^2	df	N	p-value	Decision at 0.05 Level
Teacher's Digital Skill Level x Effectiveness of Online Teaching Implementation	16.08	4	90	.003	Significant (H_o Rejected)

A chi-square test of independence presented in Table 9 demonstrated a significant association between teachers' digital skill levels and the effectiveness of implementing online teaching strategies, $\chi^2(4, N = 90) = 16.08$, $p = .003$. Consequently, the null hypothesis was rejected. This significant chi-square statistic indicates that digital skill level is a critical factor influencing the effectiveness of online teaching strategy implementation in the Plateau Central Zone, post Covid-19 era.

DISCUSSION

According to the study, the digital proficiency of secondary school teachers in the Plateau Central Zone is average. While many teachers are able to type documents and locate online resources, they find it difficult to use online platforms for student communication and collaboration. This is in line with van Deursen and Dijk (2019), who noted that teachers frequently perform well when using computers in basic ways but struggle when handling more complicated digital tasks. It also backs up the findings of Osunwusi and Abifarin (2013), who discovered that teachers in rural Nigeria struggle to acquire strong digital skills due to inadequate infrastructure and a lack of training.

Additionally, teachers expressed a strong desire to learn more about digital instruction. They seek instruction on how to design virtual classrooms, produce engaging lessons, and employ media such as videos and so on. This supports the findings of Abolade and Yusuf (2015), who claimed that in order for teachers to enhance their instruction, they must be digitally literate. Additionally, Onyije and Yusuf (2013) pointed out that teachers' lessons become more engaging and successful when they are proficient with digital technologies. The teachers' desire to learn demonstrates that, with the correct encouragement and direction, they are adaptable.

Most teachers agree that employing digital skills improves education and makes it more engaging for pupils. This confirms UNESCO's (2020) assertion that digital skills are essential for modern education. However, some teachers claim that digital education increases their burden because it takes longer to prepare classes. This problem is comparable to what Olushola and Adeolu (2020) discovered: online teaching may be time-consuming and stressful, particularly when schools lack adequate resources.

The study also discovered that poor internet access, immense data charges, and little technical help make online education challenging. These issues are similar to those raised by Osunwusi and Abifarin (2013) and Olushola and Adeolu (2020), who stated that a lack of infrastructure and expensive prices make it difficult for teachers to teach effectively online. These issues require government attention and more effective legislation to promote teachers' access to digital tools and the internet.

Furthermore, the study found that teachers with superior digital abilities taught more successfully online. This confirms Hrastinski (2009) and Kapp (2012), who said that teachers' performance in digital instruction is dependent on their ability to use technology. Overall,

improving teachers' digital abilities through training and increased internet access will strengthen teaching and learning in the digital age.

CONCLUSION

The study found that teachers in Plateau Central Zone secondary schools have some level of digital ability, despite the fact that most teachers struggle to utilise digital tools for instruction and communication even though they can complete simple digital activities like document input and learning resource retrieval. Teachers are ready to increase their digital understanding by means of training. The results also showed that, their judgements are sometimes constrained by poor internet connectivity, exorbitant data charges, insufficient devices and lack of technical support. It was also found that teachers who effectively teach online have more proficiency in using digital instruments, therefore, developing teachers' digital competence is not only about technology use but also about raising teaching quality and learning results. Therefore, for education in Plateau Central Zone and Nigeria as a whole to advance in this digital age, teachers have to be provided the proper training, resources, and infrastructure.

RECOMMENDATIONS

1. Government and educational authorities should organize regular workshops and seminars to train teachers on digital skills, focusing on practical use of online teaching tools and methods.

2. Schools should be equipped with reliable internet connections, computers, and other digital devices to support online teaching and learning.

3. The Ministry of Education should create clear policies that promote digital literacy among teachers, including incentives for teachers who engage in continuous digital training.

4. Schools should employ or assign ICT personnel to provide ongoing technical support for teachers who encounter difficulties with digital platforms.

5. Government agencies and telecommunication companies should collaborate to reduce data costs for teachers, ensuring affordable and stable internet access.

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