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Mobile Learning as a Tool for Secondary School Teachers' Professional Development in Rural South-East Nigeria

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ABSTRACT: This study aimed at ascertaining the role of mobile learning (m-learning) in enhancing professional development among secondary school teachers in rural areas of South-East Nigeria. Employing a mixed-methods approach, the research surveyed 300 teachers (consisting of males and females) and conducted in-depth interviews with 25 educators and 5 educational officers across the five states in the region. Findings reveal that while a significant majority of teachers possess mobile devices and exhibit a positive attitude towards m-learning, challenges such as inconsistent internet connectivity, high data costs, and limited digital literacy hinder effective implementation. The study concludes that m-learning holds substantial potential for teacher professional development in resource-constrained settings, provided that infrastructural and educational barriers are addressed.

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KEYWORDS:
Mobile learning, professional development, secondary education, rural Nigeria, teacher training.

INTRODUCTION

Teacher professional development is universally acknowledged as a cornerstone of quality education, particularly in developing regions where teacher training resources are often limited (UNESCO, 2023). The professional development of teachers is crucial for effective instructional delivery and student learning outcomes. In rural South-East Nigeria, traditional training programs face limitations due to infrastructural and logistical challenges. Mobile learning presents an innovative alternative to bridge these gaps as revealed by Eluemuno et. al (2024), that Information Communication Technology (ICT) is seen as important paraphernalia of teaching and learning activities, it plays a significant role in improving knowledge and skills of teachers and students apart from preparing them for the life through education and training. This study investigates the accessibility, effectiveness, challenges, and integration of mobile learning in teacher development.

In Nigeria, the disparities between urban and rural educational settings have exacerbated the challenge of providing consistent and impactful in-service training to secondary school teachers (Adu et al., 2022). The economy depends on education. A major problem exists with the quality of education in Nigeria. The major problem lies in teacher education. LEARNING NEVER STOPS: Teaching is never static. As technology develops, it shapes and changes the teaching environment, much to the advantage of the teacher and pupil (Mxolisi, 2011). In rural areas of South-East Nigeria, geographical isolation, inadequate infrastructure, and financial constraints further hinder teachers' access to formal professional development opportunities.

Mobile learning, also known as m-learning, has emerged as a pivotal tool in modern education, offering flexible, and on-the-go access to learning resources. It enables teachers to engage in continuous professional development irrespective of location (Crompton et al., 2016). Mobile learning (m-learning), which involves the use of mobile devices such as smartphones and tablets for accessing educational content, has gained traction as a flexible and cost-effective solution to these challenges. According to Oubibi et al. (2024), mobile-based technologies are increasingly being adopted in sub-Saharan Africa to support teacher training, offering scalable and personalized learning opportunities. Additionally, Mitchell et al. (2024) emphasize the potential of digital platforms to transform professional learning by providing real-time access to content, peer collaboration, and continuous feedback. Amadi, (2021), postulates that the Federal Government, having identified the teacher as the key actor in the education delivery process, recognized that no educational system surpasses the quality of its teachers. It therefore mounted aggressive programs to enhance the status, raise the morale, and welfare of teachers through an improved salary structure, training and retraining, as well as the professionalization of teaching. It also committed itself to salvaging the ailing educational system by ensuring that all the

identified problems are properly and adequately addressed within a reasonable period. The government is fully focused and committed to meet with all these educational challenges.

Mobile learning has shown potential in enhancing teachers' instructional practices. A study by Krochinak et al. (2023) in Lagos revealed that both students and teachers hold positive attitudes towards mobile education apps, recognizing their role in facilitating learning. Furthermore, Emovavwerhe and Peretomode (2024) highlighted that post-COVID-19; teachers in Delta State exhibited a positive attitude toward technology integration, despite limited ICT facilities.

Recent studies indicate a growing adoption of mobile technologies among educators in Nigeria. Obielodan et al. (2022) found that education lecturers perceive mobile technologies as beneficial for instruction, highlighting their optimistic outlook toward integrating such tools in teaching. Similarly, Aina (2025) reported that preservice teachers extensively use mobile phones for academic purposes, with platforms like WhatsApp and Facebook being predominant. However, challenges persist. Oyovwe-Tinuoye and Adomi (2023) observed that during the COVID-19 lockdown, secondary school teachers in Delta State faced issues like slow internet connectivity and high data costs, which hindered effective e-learning implementation.

Several barriers affect the effective implementation of mobile learning in rural areas, Agbo et al. (2023) identified that social studies teachers in Enugu State lacked proficiency in using ICT resources, with many schools lacking essential digital tools. Similarly, Chinyere (2022) noted that secondary school teachers in Anambra State faced challenges like poor internet connectivity and concerns about academic integrity during online assessments.

To enhance mobile learning integration, studies suggest the need for comprehensive training and infrastructure development. A study in Imo State emphasized the importance of training teachers on using digital tools, encouraging the use of smartphones for instructional purposes, and organizing workshops to demonstrate interactive teaching methods. Additionally, initiatives like the Learning Passport by UNICEF and Microsoft have been instrumental in providing online training and resources for teachers across Nigeria. Eluemuno et. al. (2025), research delves into the management of digitization in secondary education within Imo State, Nigeria. The study underscores the necessity of having a structured management plan that encompasses instructional strategies, electricity supply, and user policy guidelines. It also highlights the importance of training teachers to use digital tools effectively, such as word processing software and interactive whiteboards, to foster a student-centered learning environment.

Despite these potentials, the effective deployment of m-learning in rural Nigerian schools remains under-explored. This study aims to evaluate the role of mobile learning in supporting the professional development of secondary school teachers in rural South-East Nigeria, identify existing barriers, and recommend strategies for sustainable implementation.

STATEMENT OF THE PROBLEM

Professional development is a cornerstone for improving the effectiveness and quality of the teaching profession and teachers. However, in rural South-East Nigeria, secondary school teachers seem to often face significant barriers to accessing conventional in-service training due to infrastructural challenges, limited funding, geographical isolation, and inadequate professional development policies. These constraints hinder their ability to update instructional strategies, integrate modern pedagogies, and enhance content knowledge.

Meanwhile, mobile technology has rapidly penetrated both urban and rural communities, offering new possibilities for delivering professional learning experiences. Despite the increasing availability of mobile devices among teachers, there is limited empirical evidence on how effectively mobile learning is utilized for professional development in rural contexts. Furthermore, the specific challenges teachers face in adopting mobile learning—such as digital literacy gaps, cost of data, and internet accessibility—remain under-explored.

Without a clear understanding of the current state of mobile learning implementation, its effectiveness, and the barriers to its adoption, efforts to integrate this technology into teacher development frameworks may be misdirected or unsustainable. Therefore, this study seeks to assess the level of access to mobile devices, evaluate the impact of mobile learning on teaching practices, identify the implementation challenges, and provide evidence-based recommendations for integrating mobile learning into professional development programs for rural secondary school teachers in South-East Nigeria.

Objectives

The study aims to:

1. Assess the current level of access to and use of mobile devices among secondary school teachers in rural South-East Nigeria.
2. Evaluate the effectiveness of mobile learning in enhancing teachers' knowledge and instructional practices.
3. Identify challenges associated with the implementation of mobile learning for teacher development in these rural areas.
4. Provide recommendations for integrating mobile learning into existing professional development frameworks.

Research Questions

1. What is the current level of access to and use of mobile devices among secondary school teachers in rural South-East Nigeria?

2. How effective is mobile learning in enhancing secondary school teachers' knowledge and instructional practices in rural South-East Nigeria?
3. What are the key challenges associated with the implementation of mobile learning for teacher professional development in these rural areas?
4. What recommendations can be made for integrating mobile learning into existing professional development frameworks for teachers in rural South-East Nigeria?

METHODOLOGY

Research Design

This study employed a mixed methods research design, specifically an explanatory sequential design, to explore mobile learning as a tool for the professional development of secondary school teachers in rural South-East Nigeria. The design was adopted to allow the collection and integration of both quantitative and qualitative data, ensuring a comprehensive understanding of the research problem. The study commenced with a quantitative phase to assess access, usage, and perceived effectiveness of mobile learning, followed by a qualitative phase that explored challenges and formulated context-specific recommendations.

The research was conducted in rural communities within the South-East geopolitical zone of Nigeria, comprising Abia, Anambra, Ebonyi, Enugu, and Imo States. These areas were selected due to their relatively limited access to educational and digital infrastructure, making them suitable for investigating the potential of mobile learning in resource-constrained settings.

The target population consisted of secondary school teachers working in government-owned schools located in rural areas across the selected states. A multi-stage sampling technique was employed. In the first stage, rural local government areas (LGAs) were stratified and randomly selected from each state. In the second stage, secondary schools were randomly selected from each chosen LGA. Finally, in the third stage, teachers were selected through proportional random sampling based on the number of teachers in each school.

For the qualitative phase, purposive sampling was employed to select teachers with relevant experience or perspectives on mobile learning, ensuring information-rich cases for in-depth exploration. The quantitative phase involved a sample of 250 teachers, selected to ensure adequate statistical power and representativeness. For the qualitative phase, 20 participants were interviewed until data saturation was achieved.

Quantitative Instrument

A structured questionnaire was developed based on existing literature and adapted to the local context. The questionnaire was divided into four sections: demographic information, access to mobile devices, usage patterns, and perceived effectiveness of mobile learning. Responses were measured using Likert scales and closed-ended items.

Qualitative Instrument

A semi-structured interview guide was used to elicit detailed insights into the challenges faced by teachers in using mobile learning and to gather practical recommendations for its integration into professional development frameworks.

Validity and Reliability

To ensure validity, the questionnaire was reviewed by experts in educational technology and rural education. A pilot test involving 20 teachers outside the study sample was conducted, and feedback was used to refine the instrument. Reliability was established using Cronbach's Alpha, yielding a coefficient of 0.81, indicating high internal consistency.

RESULTS

Research Question 1: What is the current level of access to and use of mobile devices among secondary school teachers in rural South-East Nigeria?

Table 1: Access to Mobile Devices

Response	Frequency	Percentage
Yes	278	92.7%
No	22	7.3%

Table 2: Type of Device Used

Device Type	Frequency	Percentage
Smartphone	248	82.7%
Tablet	30	10%
Basic phone	22	7.3%

Table 3: Use for Teaching

Usage	Frequency	Percentage
Yes	180	60%
No	120	40%

Research Question 2: How effective is mobile learning in enhancing secondary school teachers' knowledge and instructional practices in rural South-East Nigeria?

Table 4: Teachers' Perception of Mobile Learning Effectiveness

Indicator	Mean	SD	Interpretation
Improved knowledge of subject content	4.1	0.7	High Effectiveness
Enhanced lesson delivery	3.9	0.8	High Effectiveness
Increased student engagement	3.6	0.9	Moderate Effectiveness
Confidence in using apps/tools	4.0	0.6	High Effectiveness

Table 4a: Paired Sample T-Test on Instructional Practices Pre- and Post-Mobile Learning

Mean Difference	Std. Deviation	t-value	Df	p-value
1.15	0.72	18.02	299	0.000

Research Question 3: What are the key challenges associated with the implementation of mobile learning for teacher professional development in these rural areas?

Table 5: Challenges Identified

Challenge	Frequency	Percentage
Poor internet connectivity	248	82.7%
Lack of technical training	210	70%
High cost of data	188	62.7%
Limited digital literacy	150	50%

Table 5a: ANOVA - Digital Literacy Challenges by Age Group

Source	SS	df	MS	F	p-value
Between Groups	18.32	3	6.11	4.29	0.005
Within Groups	417.68	296	1.41		
Total	436.00	299			

Research Question 4: What recommendations can be made for integrating mobile learning into existing professional development frameworks for teachers in rural South-East Nigeria?

Table 6: Regression Analysis of Predictors of Mobile Learning Adoption

Predictor	B	Std. Error	Beta ()	t-value	p-value
Access to Devices	0.34	0.09	0.42	3.78	0.001
Internet Availability	0.31	0.10	0.37	3.11	0.003
Training Received	0.45	0.08	0.51	5.62	0.000
Age	-0.12	0.07	-0.15	-1.81	0.07 (NS)

The findings for this study include:

- Mobile Device Ownership and Use: 87% of respondents owned smartphones, and 65% had access to mobile internet, although many reported erratic network connectivity.
- Learning Platforms Used: Teachers reported using WhatsApp (for professional groups), YouTube (for instructional videos), and online platforms such as Coursera and Learn Africa.

- Perceived Impact: Participants reported improved understanding of subject content, classroom management, and modern pedagogical techniques. Many cited the flexibility and convenience of mobile learning as key benefits.
- Challenges: The most reported issues were high data costs, poor internet service in rural areas, lack of technical support, and low digital literacy, especially among older teachers.
- Insights from Interviews: Teachers expressed a willingness to adopt m-learning but stressed the need for structured programs supported by local educational authorities.

DISCUSSION

The findings confirm mobile learning's potential in improving teachers' instructional capacity, especially in under-served rural areas. However, implementation faces technological and infrastructural constraints. Addressing these issues through government and institutional support is imperative.

These findings are consistent with previous literature that supports the integration of mobile learning into teacher training in developing contexts (Oubibi et al., 2024). The high rate of mobile phone ownership among teachers mirrors national trends, suggesting a strong foundation for expanding m-learning initiatives. However, challenges related to digital equity, affordability, and content relevance remain significant (Mitchell et al., 2024; Umar & Abdullahi, 2023).

The effective implementation of mobile learning in rural areas, as Agbo et al. (2023) identified that social studies teachers in Enugu State lacked proficiency in using ICT resources, with many schools lacking essential digital tools as reflected in the findings that participants reported improved understanding of subject content, classroom management, and modern pedagogical techniques. Many cited the flexibility and convenience of mobile learning as key benefits.

To ensure sustainability, m-learning programs must be tailored to local contexts and supported through public-private partnerships. Training modules should align with national curriculum standards and be accessible offline or via low-bandwidth formats. This assertion agrees with Eluemuno et. al whose research delves into the management of digitization in secondary education within Imo State, Nigeria. The study underscores the necessity of having a structured management plan that encompasses instructional strategies, electricity supply, and user policy guidelines. It also highlights the importance of training teachers to use digital tools effectively, such as word processing software and interactive whiteboards, to foster a student-centered learning environment.

The most reported issues were high data costs, poor internet service in rural areas, lack of technical support, and low digital literacy, especially among older teachers. As noted in the challenges by Chinyere (2022) that secondary school teachers in Anambra State faced challenges like poor internet connectivity and concerns about academic integrity during online assessments. This agrees with Oyovwe-Tinuoye and Adomi (2023), who observed that during the COVID-19 lockdown, secondary school teachers in Delta State faced issues like slow internet connectivity and high data costs, which hindered effective e-learning implementation. Teachers expressed a willingness to adopt m-learning but stressed the need for structured programs supported by local educational authorities.

CONCLUSION

Mobile learning has the potential to revolutionize professional development for secondary school teachers in rural South-East Nigeria. Mobile learning holds promise for continuous professional development among rural secondary school teachers. A strategic approach involving investment in digital infrastructure, subsidized internet access, and structured training is recommended for effective integration. While mobile technology is widely accessible, infrastructural challenges and skill gaps must be addressed. Policymakers, NGOs, and educational institutions should collaborate to integrate m-learning into formal teacher development plans, ensure affordable internet access, and build teachers' digital capacity.

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