

# Teachers' Awareness and Perception on The Effect of Mobile Learning Platform in Literacy and Numeracy Instructions in Nigeria

Achuonye, Keziah Akuoma<sup>1</sup>

*Williams, Anne Chidinma & Longjohn, Ibiene Tandii*

Date of Submission: 27-04-2026

Date of Acceptance: 05-05-2026

## Abstract

This study examined teachers' awareness and perceptions of the effectiveness of mobile learning platforms in literacy and numeracy instructions in Nigeria. Eight research questions and equivalent eight hypotheses guided the study. The study adopted descriptive survey design involving 173 teachers from public and private schools. Data was collected using a validated digital instrument titled "Teachers' Awareness and Perception of Mobile Learning Platforms Questionnaire (TAPMLPQ) ( $\alpha = 0.78$ )". Descriptive statistics, independent samples t-test, and one-way ANOVA were employed to analyze the data at a 0.05 level of significance. Findings indicated that teachers demonstrated a high level of awareness of mobile learning platforms used for literacy and numeracy instruction, regardless of gender, teaching qualification, or years of experience. However, a statistically significant difference in awareness was observed based on school ownership. The results further revealed that teachers generally held positive perceptions regarding the effectiveness of mobile learning platforms in improving students' literacy skills, numeracy competence, engagement, and motivation. It recommends targeted professional development, equitable access to digital resources across school types, and strengthened institutional support to enhance effective implementation.

**Keywords:** Mobile Learning (M-Learning) . Teachers' Perception . Teachers' Awareness . Literacy Instruction . Numeracy Instruction

## I. Introduction

In recent years, mobile learning, often referred to as *m-learning*, has emerged as a significant educational innovation, leveraging the widespread ownership of mobile technologies such as smartphones and tablets, to deliver educational content, facilitate communication, and support student engagement anytime and anywhere (Pedraja-Rejas, Muñoz-Fritis, Rodríguez-Ponce,

&Laroze, 2024; Onuba, 2025). The integration of mobile learning platforms into classroom instruction represents a significant shift in educational practice worldwide, offering innovative pathways to support teaching and learning beyond the traditional chalk-and-board model. It extends instructional opportunities beyond the traditional classroom, promising enhanced engagement, personalized learning pathways, and increased access to educational content (Pedraja-Rejas et al., 2024). In the Nigerian context, where mobile phone penetration remains high and digital solutions are progressively being explored in education, m-learning is seen as a potential tool for addressing persistent challenges in foundational literacy and numeracy instruction in both formal and informal learning environments (Ekwu, Njoku, Ikwanusi, & Madu, 2025). Access to conventional learning resources may be constrained by several challenges, mobile learning has the potential to enhance foundational literacy and numeracy skills among learners by providing flexible, interactive, and learner-centred instructional opportunities (Achuonye, Ushie, & Williams, 2026).

Teachers play a central role in the integration of mobile learning within classrooms, therefore, their awareness of m-learning platforms and perception of the educational benefits these tools offer are critical determinants of successful implementation. Evidence from Nigeria underscores the effectiveness of mobile-based instructional tools in improving basic literacy and numeracy outcomes among adult learners (Journal of Science, Technology, Mathematics and Education, 2019), suggesting that mobile applications can facilitate better performance when integrated with conventional teaching approaches. Concerning perceptions of educational stakeholders toward mobile learning, research on adult literacy programmes in Ibadan Metropolitan Area indicates that facilitators generally hold positive perceptions regarding the use of mobile phones for instructional purposes, although concerns about training, content development, and technological limitations persist (Adelore & Odedina, 2025). Similarly, broader

investigations into teachers' adoption of digital technologies during the COVID-19 pandemic revealed that mobile phones were key devices enabling continuity of teaching and learning, despite challenges with infrastructure and data access (Santas et al., 2025). These emerging findings underscore the importance of understanding teachers' perceptions — especially as they relate to core classroom competencies such as literacy and numeracy.

Teacher perception is a critical determinant of technology adoption and instructional innovation. Positive perceptions can enhance willingness and readiness to integrate mobile learning into pedagogy, potentially improving student outcomes in foundational subjects (Agarry, Babalola, & Jacob, 2024). Conversely, negative perceptions rooted in limited digital literacy, resource constraints, or pedagogical concerns may hamper effective implementation (Ekwu et al., 2025; Kayode, Alabi, Sofoluwe, & Oduwaiye, 2015). Understanding teachers' awareness and perceptions regarding mobile learning platforms is particularly important in literacy and numeracy instruction, where foundational skills are established early and are essential for lifelong learning and socio-economic participation. Nigeria's educational reforms, coupled with emerging Edtech solutions such as mobile learning platforms tailored for primary and secondary education, place teacher perception at the forefront of determining the success or failure of these digital interventions. Accordingly, exploring how teachers view, understand, and are prepared to integrate mobile learning platforms into literacy and numeracy instruction offers valuable insights for policy, teacher education, and curriculum innovation.

### Problem Statement

Despite the increasing availability and use of mobile devices in Nigeria, the effective integration of mobile learning platforms into literacy and numeracy classrooms largely depends on teachers, who serve as key agents of instructional delivery. Teachers' awareness and perceptions of mobile learning—regarding its usefulness, ease of use, and impact on learners' achievement—play a critical role in determining whether and how these platforms are adopted in classroom practice. However, empirical evidence on Nigerian teachers' perceptions of the effect of mobile learning platforms specifically on literacy and numeracy instruction remains limited. The problem this study seeks to address is the insufficient understanding of teachers' awareness and perception of the effect of mobile learning platforms on literacy and numeracy

instruction in Nigeria. Without this knowledge, efforts to implement technology-driven instructional strategies may face resistance, underutilization, or ineffective application, ultimately limiting their potential to improve students' academic performance. Therefore, this study aims to investigate teachers' awareness and perception regarding the use and effectiveness of mobile learning platforms in enhancing literacy and numeracy instruction in Nigeria.

### Objectives of the Study

The main objective of this study is to examine teachers' awareness and perceptions of the effect of mobile learning platforms on literacy and numeracy instruction in Nigeria. Specifically, the study seeks to:

1. examine teachers' awareness of mobile learning platforms used for literacy and numeracy instruction in schools, and the extent their awareness is influenced by
  - i. gender
  - ii. school ownership
  - iii. teaching qualification
  - iv. teaching experience
2. explore teachers' perceptions of the effectiveness of mobile learning platforms in improving students' literacy and numeracy skills, and the extent their perception is affected by -
  - i. gender
  - ii. school ownership
  - iii. teaching qualification
  - iv. teaching experience

### Research Questions

The following research questions guided the study,

1. to what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on gender?
2. to what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on school ownership?
3. to what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on teaching qualification?
4. to what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on teaching experience?

5. how does gender influence teachers' perception on the effectiveness of mobile learning platforms for learning literacy and numeracy?
6. how does teaching qualification influence teachers' perception on the effectiveness of mobile learning platforms for learning literacy and numeracy?
7. how does school ownership influence teachers' perception on the effectiveness of mobile learning platforms for learning literacy and numeracy?
8. how does teaching experience influence teachers' perception on the effectiveness of mobile learning platforms for learning literacy and numeracy?

### Hypotheses

These equivalent hypotheses were further formulated,

1. there is no significant difference in teachers' awareness of mobile learning platforms usage for literacy and numeracy instructions in rural schools based on gender.
2. there is no significant difference in teachers' awareness of mobile learning platforms usage for literacy and numeracy instructions in rural schools based on school ownership.
3. there is no significant difference in teachers' awareness of mobile learning platforms usage for literacy and numeracy instructions in rural schools based on teaching qualification.
4. there is no significant difference in teachers' awareness of mobile learning platforms usage for literacy and numeracy instructions in rural schools based on years of experience.
5. there is no significant difference in teachers' perception on the effectiveness of mobile learning platforms in learning literacy and numeracy skills based on gender.
6. there is no significant difference in teachers' perception on the effectiveness of mobile learning platforms in learning literacy and numeracy skills based on teaching qualification.
7. there is no significant difference in teachers' perception on the effectiveness of mobile learning platforms in learning literacy and numeracy based on school ownership.

8. there is no significant difference in teachers' perception on the effectiveness of mobile learning platforms in learning literacy and numeracy skills based on teaching experience.

### Significance of Study

The findings of this study are expected to be significant to several stakeholders in the Nigerian education sector. For teachers, the study will provide insights into how mobile learning platforms can support literacy and numeracy instruction, as well as highlight common challenges that may hinder effective classroom integration. This may encourage reflective practice and inform teachers' professional development needs in digital pedagogy.

For school administrators and education policymakers, the study will offer empirical evidence on teachers' awareness level and perceptions of mobile learning platforms, which can inform decisions regarding technological tool distribution and integration, teacher training programmes, and infrastructural allocation. Understanding teachers' views can help ensure that mobile learning initiatives are aligned with classroom realities and instructional goals, particularly in foundational subject areas.

Curriculum planners and educational technology developers will also benefit from the findings by gaining insights into the suitability and perceived effectiveness of mobile learning platforms for literacy and numeracy instruction. This can guide the development of contextually relevant digital content and user-friendly platforms tailored to the Nigerian classroom environment. Additionally, the study will contribute to the existing body of knowledge on mobile learning in developing countries by providing subject-specific evidence from Nigeria, thereby serving as a reference for future research in educational technology and basic education.

### Conceptual Framework

This study is anchored on the assumption that teachers' awareness and perceptions influence their use of mobile learning platforms, which in turn affects literacy and numeracy instruction. The conceptual framework illustrates the relationship between mobile learning platforms, teachers' awareness and perceptions, and literacy and numeracy outcomes, while acknowledging the role of intervening factors.

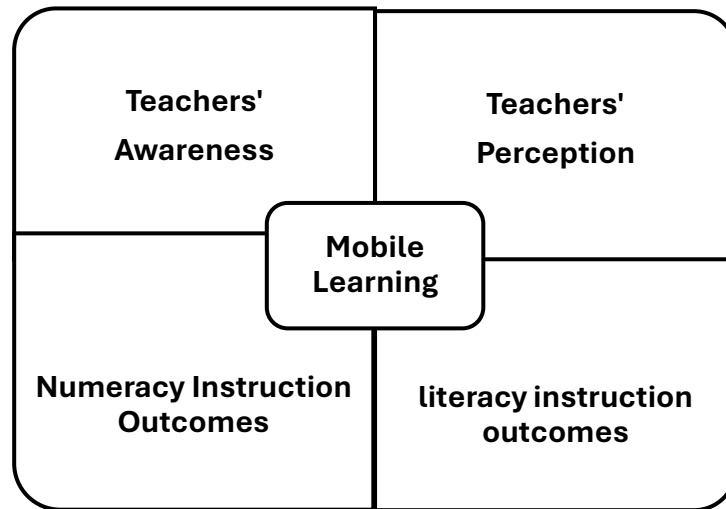


Fig. 1: Interaction of Mobile Learning with Awareness and Perception

**Independent Variable**

- Mobile learning platforms - (e.g., educational apps, and interactive digital content)

**Dependent Variables**

- Teachers' awareness and perceived impact on Literacy and Numeracy instruction

**Moderator Variables**

- Teachers' qualities: (gender and teaching experience)
- School: location (rural and urban) and school type (nursery, primary, secondary and tertiary)

The framework suggests that teachers' high level of awareness, supported by positive perceptions, are likely to enhance the impact of mobile learning platforms, thereby improving literacy and numeracy instruction. Conversely, poor awareness, negative perceptions and contextual challenges may limit the instructional impact of mobile learning platforms.

**Mobile Learning Platform**

Mobile learning (m-learning) platforms are digital educational systems accessed through mobile devices such as smartphones and tablets. These platforms deliver instructional content, assessments, and interactive learning experiences. Examples include ABC, 123, Google Classroom, Seesaw, Khan Academy, uLesson, etc. Mobile learning platforms may offer interactive lessons, digital textbooks, audio-visual learning materials, instant feedback and assessments, and or gamified learning experiences. In the Nigerian context, mobile learning platforms are particularly significant

because of the widespread use of smartphones, even in resource-constrained environments.

**Teachers' Awareness**

Teachers' awareness refers to the level of knowledge, familiarity, and understanding that teachers have about mobile learning platforms and their application in literacy and numeracy instruction. Awareness includes knowledge of available mobile learning platforms, understanding of how these platforms function, awareness of their instructional benefits and limitations, and knowledge of policies guiding technology integration in education. Awareness is important because teachers cannot effectively implement what they do not know or understand. In this study, awareness determines whether teachers are informed about mobile learning tools and their potential role in improving literacy and numeracy outcomes.

**Teachers' Perception**

Teachers' perception refers to their beliefs, attitudes, opinions, and judgments about the usefulness, effectiveness, and practicality of mobile learning platforms in teaching literacy and numeracy. Perception may be positive (e.g., viewing mobile learning as innovative and helpful), negative (e.g., seeing it as distracting or difficult to manage), or neutral (e.g., uncertainty about its effectiveness). Teachers' perceptions influence their willingness to adopt and consistently use mobile learning technologies. Even when awareness is high, negative perceptions can limit successful implementation.

### Literacy Instruction

Literacy instruction refers to the teaching of reading, writing, speaking, listening, and comprehension skills. At the basic education level in Nigeria, literacy forms the foundation for academic success and lifelong learning. Literacy instruction may involve phonics and word recognition, vocabulary development, reading comprehension, writing skills, and language fluency. Mobile learning platforms can support literacy by providing interactive reading materials, audio support, spelling exercises, and reading comprehension quizzes.

### Numeracy Instruction

Numeracy instruction refers to the teaching of mathematical skills necessary for everyday life and academic progress. It includes the ability to understand and work with numbers. Key areas include number recognition and counting, basic arithmetic (addition, subtraction, multiplication, division), problem-solving skills, and logical reasoning. Mobile learning platforms can enhance numeracy through interactive exercises, visual demonstrations, instant feedback, and gamified problem-solving activities.

### Technology Integration in Education

Technology integration refers to the effective incorporation of digital tools into teaching and learning processes to improve educational outcomes. Effective integration requires teacher competence, institutional support, adequate infrastructure, and positive teacher attitudes. In Nigeria, technology integration is often influenced by factors such as internet access, electricity supply, teacher training, and government policies.

### Instructional Effectiveness

Instructional effectiveness refers to the extent to which teaching methods, tools, and strategies improve student learning outcomes. In this study, instructional effectiveness focuses on whether mobile learning platforms improve pupils' reading and writing abilities, enhance mathematical understanding, increase student engagement, and support differentiated learning. Teachers' awareness and perception directly affect how effectively mobile learning platforms are used to achieve literacy and numeracy goals.

### Nigerian Educational Context

The Nigerian educational system provides the broader context for this study. It is regulated by the Federal Ministry of Education and guided by national education policies. Challenges in the Nigerian context include large class sizes, inadequate instructional materials, limited teacher training in digital skills, and unequal access to technology. Understanding this context is essential to examining how mobile learning platforms function within literacy and numeracy instruction.

The major concepts in this study—teachers' awareness, teachers' perception, mobile learning platforms, literacy instruction, numeracy instruction, technology integration, instructional effectiveness, and the Nigerian educational context—are interconnected. Teachers' awareness influences their perception, and together they determine how effectively mobile learning platforms are integrated into literacy and numeracy instruction in Nigeria.

### Theoretical Background

The theoretical foundation for studying mobile learning in education draws from several learning theories that explain how technology mediates knowledge construction and instructional practices.

#### Technology Acceptance Model (TAM)

This was developed by Fred Davis in 1989. TAM explains how users come to accept and use new technologies. The model is built on two key constructs:

- *Perceived Usefulness (PU)*: The degree to which a teacher believes that using a mobile learning platform will improve literacy and numeracy instruction.
- *Perceived Ease of Use (PEOU)*: The degree to which a teacher believes that using the platform will be free of effort.

According to TAM, when teachers perceive mobile learning platforms as useful and easy to use, they are more likely to develop positive attitudes toward them and integrate them into classroom instruction. This theory directly supports the investigation of teachers' awareness and perception. Teachers who are aware of mobile learning platforms and perceive them as beneficial and manageable are more likely to adopt them in literacy and numeracy teaching. Conversely, if they perceive them as complex or ineffective, adoption may be low.

#### Constructivist Learning Theory

This theory is strongly associated with scholars such as Jean Piaget and Lev Vygotsky. The theory posits that learners actively construct knowledge through interaction, experience, and social engagement rather than passively receiving information (Yakar et al., 2020). Key principles include learning as learner-centered, knowledge as constructed through experience, social interaction enhances learning, and teachers act as facilitators rather than sole knowledge providers. Mobile learning platforms align with constructivist principles because they: encourage interactive and self-paced learning, provide multimedia content, promote collaborative learning opportunities and allow students to engage actively with literacy and numeracy tasks. This theory supports the idea that mobile learning platforms can enhance literacy and numeracy instruction by creating interactive, learner-centered environments. Teachers' perception of whether these platforms truly support meaningful learning experiences is central to this study.

#### Diffusion of Innovations Theory

This was developed by Everett Rogers in 1962. The theory explains how new ideas, technologies, or practices spread within a social system over time.

The theory identifies five factors influencing adoption:

- a. Relative Advantage – Is the mobile learning platform better than traditional teaching methods?
- b. Compatibility – Does it align with teachers' beliefs, curriculum, and classroom practices?
- c. Complexity – Is it easy or difficult to use?
- d. Trialability – Can teachers test it before full adoption?
- e. Observability – Are its results visible to others?

Teachers are categorized as innovators, early adopters, early majority, late majority, or laggards depending on how quickly they embrace innovation. This theory helps explain differences in teachers' awareness and perception. In Nigeria, some teachers may quickly adopt mobile learning platforms, while others may resist them due to perceived complexity, lack of infrastructure, or incompatibility with existing practices. Understanding these dynamics helps explain the extent of technology integration in literacy and numeracy instruction. The Technology Acceptance Model explains teachers' behavioral intention to use mobile learning platforms. Constructivist Learning Theory provides a pedagogical foundation for how such platforms can improve literacy and numeracy learning. Diffusion

of Innovations Theory explains how mobile learning adoption spreads among teachers within the Nigerian educational system.

Also relevant is Connectivism theory - a digital age that emphasizes the importance of networks and technology in the learning process (Siemens & Downes, 2005). It suggests that learning occurs across interconnected digital platforms and knowledge resides in the network rather than solely within individual cognition. Mobile learning platforms provide learners and teachers access to diverse information sources and connect them through digital networks, facilitating up-to-date knowledge acquisition and exchange. Together, these theoretical perspectives provide a strong theoretical foundation for examining teachers' awareness and perception of the effect of mobile learning platforms on literacy and numeracy instruction in Nigeria. They underscore the potential of mobile learning platforms to support active, collaborative, and contextually relevant teaching and learning practices, which are critical for foundational skills such as literacy and numeracy.

#### Potentials of Mobile Learning

Studies highlight that mobile learning can enhance accessibility to educational content and potentially support improved learning outcomes in core subjects such as literacy and numeracy (Ekwu et al., 2025). However, while the promise of mobile learning is widely acknowledged, its implementation in Nigerian classrooms is often confronted by challenges including slow internet connectivity/speed, data cost, poor power supply and limited digital literacy among teachers and learners (Jumare & Shehu, 2025). Santas, Udende, Inobemhe, and Modeyin (2025) investigated teachers' perceptions of digital technologies during the COVID-19 pandemic and reported that mobile phones, alongside other digital tools, were instrumental in delivering instruction remotely, although teachers encountered challenges such as unstable power supply and high data costs. This study highlights how teachers in Nigeria recognize the utility of mobile technologies, though it focused broadly on digital tools rather than subject-specific outcomes. This corroborates with the finding by Bacolod (2022) that most of the teachers and students viewed mobile learning as an indispensable learning tool and agreed about its significance during this time of restricted learning despite some difficulties in implementation

Ekwu et al. (2025) examined mobile-based learning in STEM education and noted that mobile learning

can increase accessibility and student engagement, yet infrastructure limitations and digital illiteracy remain barriers to broader implementation. While this study underscores the potential of mobile learning to support subject-specific instruction, it did not specifically address literacy or numeracy or teachers' perceptions in primary and secondary environments. Several studies also report digital divides and gaps in mobile learning adoption. Musa and Amshi (2024) identified that technology access, affordability of devices, internet connectivity, and limited digital skills among both lecturers and students significantly constrain the successful integration of mobile learning into instructional practice.

#### Teachers' Perceptions of Digital Technologies for E-Learning in Nigeria

A recent study by Santas, Udende, Inobemhe, and Modeyin (2025) investigated Nigerian teachers' perception of adopting digital technologies — including mobile devices — during the COVID-19 pandemic. The research found that teachers viewed digital technologies, such as mobile phones and tablets, as valuable tools in facilitating remote instruction during school closures. Despite the benefits, participants reported challenges such as unstable power supply, high data costs, and distractions from non-educational uses of technology. The study emphasizes the need to strengthen infrastructural support and teacher readiness to effectively integrate digital technologies into instruction. This study highlights Nigerian teachers' perceptions of digital tools like mobile learning platforms, illustrating positive attitudes toward their instructional usefulness but also identifying real-world barriers to effective implementation — a key concern in your own study.

#### Awareness and Perception of ICT Resources among Mathematics Teachers

Salawu, Ameen, and Adeniji (2023) examined senior secondary school mathematics teachers' awareness and perceptions of ICT resources for teaching and learning in Kwara State, Nigeria. Findings revealed that mathematics teachers were generally aware of and had positive perceptions toward ICT resources for instructional purposes, regardless of teaching experience. The study suggests that when teachers understand the usefulness and ease-of-use of technology, they are more likely to adopt it in classroom practice. Although focused on broad ICT rather than strictly mobile learning platforms, this research underscores

the importance of both *awareness* and *perception* of educational technologies in teachers' instructional decisions — directly aligning with your study's variables.

#### Perceptions of Mobile Technologies in Nigerian Schools

A qualitative study on secondary school teachers in Oyo State explored their perceptions of mobile technologies for teaching and learning. Teachers generally held positive perceptions, acknowledging the potential of mobile devices to support critical tasks, increase productivity, enhance accessibility, and diversify instructional approaches. However, they also identified challenges such as infrastructure deficits and limited access to advanced mobile technologies. This Nigerian context-based study directly relates to the core of your inquiry — how teachers perceive mobile technologies in instruction. It provides important insights into perceived benefits and barriers, which are crucial when assessing teacher readiness for mobile learning platforms in literacy and numeracy.

#### Mobile Phone Use in Adult Literacy Instruction (Ibadan)

Adelore and Odedina (2017) investigated facilitators' perception of using mobile phones for instruction in adult literacy programmes in Ibadan. They found that facilitators held generally *positive perceptions* about mobile phone use for instructional purposes, particularly for administrative tasks and instructional delivery. However, challenges including lack of training and limited digital skills were identified as constraints. Although focused on adult literacy, this study underscores common themes in mobile learning research — teacher/facilitator perception, training needs, and technological challenges — all of which are relevant when examining teachers' perception of mobile platforms in basic education.

#### Systematic Evidence on Mobile Learning and Outcomes

A global review of mobile learning research (Pedraja-Rejas et al., 2024) demonstrates that the integration of mobile learning tools can positively influence students' learning outcomes and critical thinking across contexts. The review emphasizes that teacher familiarity with mobile learning environments enhances the technology's effectiveness in improving educational results. This international evidence supports the theoretical link

in your study between *technology adoption* and *learning outcomes* — suggesting that teachers' awareness and perception may influence how mobile learning affects literacy and numeracy performance.

#### Summary of the Literature Review and Identified Research Gap

The reviewed literature shows that mobile and digital technologies have increasingly been recognized as valuable tools for improving teaching and learning processes. Studies conducted in Nigeria and other developing contexts indicate that teachers generally demonstrate moderate to high awareness of ICT tools and often hold positive perceptions toward their use in education. Research has also established that mobile learning platforms can enhance student engagement, provide interactive learning experiences, and improve academic performance when effectively implemented.

Empirical studies further reveal that teachers' perception of usefulness, ease of use, and compatibility significantly influence their willingness to adopt digital technologies in instruction. Theoretical frameworks such as the Technology Acceptance Model (TAM) and Diffusion of Innovations Theory consistently show that awareness and perception are critical determinants of technology integration in classrooms. Additionally, global evidence suggests that mobile learning has the potential to improve learning outcomes in literacy and numeracy through personalized instruction, instant feedback, and multimedia support.

However, despite the growing body of research on ICT integration and mobile learning, several gaps remain:

- a. *Limited focus on mobile learning platforms specifically* – Many Nigerian studies focus broadly on ICT use rather than on structured mobile learning platforms designed for instructional delivery.
- b. *Insufficient subject-specific investigation* – Few studies specifically examine the impact of mobile learning on literacy and numeracy instruction, which are foundational areas of education.
- c. *Inadequate attention to teachers' awareness and perception together* – While some studies examine perception and others examine awareness; limited research investigates both variables simultaneously in relation to literacy and numeracy outcomes.

- d. *Context-specific gaps in Nigeria's basic education level* – There is limited empirical evidence focusing specifically on primary and junior secondary school teachers, who are directly responsible for foundational literacy and numeracy development.

Therefore, the gap this study sought to fill is the lack of comprehensive empirical evidence on teachers' awareness and perception of the effect of mobile learning platforms on literacy and numeracy instruction in Nigeria, particularly at the basic education level. By examining both awareness and perception together, and focusing specifically on literacy and numeracy instructions, this study provided context-specific insights that can guide policymakers, school administrators, and educational stakeholders improve technology integration strategies within Nigerian schools.

## II. Methodology

The study adopted a descriptive survey design. The respondents for this study were all teachers involved in teaching at all levels - public and private schools. The target group was chosen because they are directly engaged in teaching and are therefore affected by the integration of mobile learning technology (MLT). The teachers were sourced using a mixed sampling strategy purposive and accidental, with the intent to capture educators who have at least some exposures to digital learning tools, whether formally integrated into their school's curriculum or adopted informally.

The recruitment process relied primarily on digital dissemination of the survey link via email and teacher WhatsApp groups. School administrators and other teachers were contacted to request participation, and most agreed to forward the survey to relevant staff. In addition, a small number of teachers were contacted through social media professional groups — especially WhatsApp and Facebook groups — allowing the survey to reach individuals beyond the initial administrative networks. This method ensured a diverse yet relevant pool of 173 respondents while leveraging spaces where teachers already communicate and share pedagogical resources.

The main instrument used for data collection was a Google Form (structured digital questionnaire) titled: "*Teachers' Awareness and Perception of Mobile Learning Platforms Questionnaire (TAPMLPQ)*." The questionnaire was divided into 6 sections; however, only sections 1 – 4 were used for this article:

- Section 1: Introductory section

- Section 2: Demographic information - gender, qualification, years of experience, school location and type).
- Section 3: Teachers’ awareness of mobile learning platforms.
- Section 4: Teachers’ perception of the effectiveness of mobile learning

The items were structured on a five-point Likert scale.

To ensure content and face validity, the questionnaire was subjected to expert review. Experts in Educational Technology, Measurement and Evaluation, and Language/Mathematics Education examined the instrument for clarity, relevance, appropriateness of items, and alignment with the research objectives. Their suggestions and corrections were incorporated before the final administration of the instrument.

A pilot study was conducted using a small group of teachers outside the main study area. The responses were analyzed using Cronbach’s Alpha to determine the internal consistency of the instrument. A reliability coefficient of 0.78 was considered

acceptable, indicating that the instrument was reliable for the study.

Data collected were coded and analyzed using the Statistical Package for Social Sciences (SPSS). The following statistical methods were used: descriptive Statistics(Frequency counts, Percentages, Mean, and Standard deviation; and Inferential Statistics (Independent t-test to test differences based on gender or school type, and Analysis of Variance (ANOVA) to test differences based on years of experience or qualification. All hypotheses were tested at 0.05 level of significance.

### Analysis and Presentation of Results

The Google Form recorded responses, analysis and generated graphical representations of the responses item by item.

RQ<sub>1</sub>: To what extent are teachers’ aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on gender?

HO<sub>1</sub>: There is no significant difference in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on gender.

Table 1: Independent sample t-test of teachers’ awareness of mobile learning platforms based on gender

Items	Gender	N	Mean	Std. Dev	T	df	Sig 2-tail	Decision
How familiar are you with Mobile learning platforms designed for teaching?	Male	94	4.18	1.00	1.47	171	0.144	NS Accept HO
	Female	79	3.96	.94				
How would you rate your knowledge of how Mobile Learning Platforms can be integrated into your teaching?	Male	94	3.87	1.01	1.13	171	0.26	NS Accept HO
	Female	79	3.70	1.02				

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 1 shows that since all the mean scores are above 3.5, both male and female teachers are aware of mobile learning platforms used for literacy and numeracy instructions to a high extent. Though the male teachers have slightly higher mean values than the female teachers indicating that they are slightly more aware with the use of mobile learning platforms used for literacy and numeracy instructions. However, the independent t-test analysis shows that there is no significant difference in the level of awareness of the teachers based on gender since the t-values are 1.47 and 1.13, df=171, and significant 2-tail values=0.14 and 0.26 both higher than the accepted value of 0.05. This implies

that the Hypothesis which states that there is no significant difference in the in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on gender is accepted.

RQ<sub>2</sub>: To what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on school ownership?

HO<sub>2</sub>: There is no significant difference in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on school ownership.

Table 2: Independent sample t-test of teachers’ awareness of mobile learning platforms based on school ownership.

Items	School ownership	N	Mean	Std. Dev.	T	Df	Sig 2-tail	Decision
How familiar are you with Mobile learning platforms designed for teaching?	Private	54	3.69	1.13	-3.71	171	0.00	Significant Reject HO
	Public	119	4.26	0.85				
How would you rate your knowledge of how Mobile Learning Platforms can be integrated into your teaching?	Private	54	3.65	1.07	-1.25	171	0.00	Significant Reject HO
	Public	119	3.86	0.99				

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 2 shows that since all the mean scores are above 3.5, both teachers in public and private schools are aware of mobile learning platforms used for literacy and numeracy instructions to a high extent. Though the teachers in public schools have slightly higher mean values than those in private schools, indicating that they are slightly more aware with the use of mobile learning platforms used for literacy and numeracy instructions. The independent t-test analysis shows that there is a significant difference in the level of awareness of the teachers based on school ownership since the t-values of -3.71 and -1.25, df=171, gave significant 2-tail

values=0.00 and 0.00 both less than the accepted value of 0.05. This implies that the Hypothesis which states that there is no significant difference in the in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on school ownership is rejected.

RQ<sub>3</sub>: To what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on highest teaching qualification?

Table 3a: Mean and standard deviation of mean scores of teachers’ awareness of mobile learning platforms based on highest teaching qualification

Items	Highest qualification	N	Mean	Std. Deviation
How familiar are you with Mobile learning platforms designed for teaching?	NCE	9	4.22	.97
	First degree	54	3.81	1.10
	Masters	51	4.18	.95
	PhD.	59	4.22	.85
	Total	173	4.08	.98
How would you rate your knowledge of how Mobile Learning Platforms can be integrated into your teaching?	NCE	9	3.88	.78
	First degree	54	3.69	1.06
	Masters	51	3.92	.98
	PhD.	59	3.76	1.06
	Total	173	3.79	1.02

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 3a shows that since all the mean scores are above 3.5, all the teachers are aware of mobile learning platforms used for literacy and numeracy instructions to a high extent irrespective of their highest teaching qualification.

HO<sub>3</sub>: There is no significant difference in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on highest teaching qualification.

Table 3b: ANOVA of difference in teachers’ awareness based on highest teaching qualification

Item	Sum of squares	Df	Mean Squares	F	Sig.	Decision
Between Groups	11.321	3	3.7 mean squares	1,227	.302	NS – Accept

Within groups	519.882	169	74			HO
Total	531.202	172	3.076			

The ANOVA analysis in table 3b shows that there is no significant difference in the level of awareness of the teachers based on highest teaching qualification with  $F=1.227$ ,  $df=3, 169$ , and significant 2-tail  $=0.302$  which is higher than the accepted value of 0.05. This implies that the Hypothesis which states that there is no significant difference in the in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on highest teaching qualification is accepted.

RQ4: To what extent are teachers aware of mobile learning platforms used for literacy and numeracy instructions in rural areas based on years of teaching experience?

Table 4a: Mean and standard deviation on mean scores of teachers’ awareness based on years of teaching experience

Item	Teaching experience (Years)	N	Mean	Std. Deviation
How familiar are you with Mobile learning platforms designed for teaching?	1 to 5 years	34	3.62	1.13
	6 to 10 years	48	4.08	1.00
	11 to 15 years	31	4.23	0.88
	16 to 20 years	31	4.21	0.94
	21 years and above	29	4.21	0.73
	Total	173	4.08	0.98
How would you rate your knowledge of how Mobile Learning Platforms can be integrated into your teaching?	1 to 5 years	34	3.82	0.90
	6 to 10 years	48	3.83	0.97
	11 to 15 years	31	3.74	0.99
	16 to 20 years	31	4.03	1.04
	21 years and above	29	3.50	1.18
	Total	173	3.79	1.01

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 4a shows that since all the mean scores are above 3.5, all the teachers are aware of mobile learning platforms used for literacy and numeracy instructions to a high extent irrespective of their years of teaching experience.

HO4: There is no significant difference in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on years of experience.

Table 4b: ANOVA of differences in the teachers’ awareness based on teaching experience

Items	Sum of squares	Df	Mean square	F	Sig,	Decision
Between groups	14.882	4	3.720	1.211	,308	NS – Accept
Within groups	516.320	168	3.073			HO
Total	531.202	172				

The ANOVA analysis in table 4b shows that there is no significant difference in the level of awareness of the teachers based on years of teaching experience with  $F=1.211$ ,  $df=4, 168$ , and significant 2-tail  $=0.308$  which is higher than the accepted value of 0.05. This implies that the Hypothesis which states that there is no significant difference in the in teachers’ awareness of mobile learning platforms used for literacy and numeracy instructions in rural Nigerian schools based on years of teaching experience is accepted.

RQ5: To what extent do educators perceive the effectiveness of mobile learning platforms in improving students’ literacy and numeracy based on gender?

HO5: There is no significant difference in teachers’ perception of effectiveness of mobile learning platforms in improving students’ literacy and numeracy skills based on Gender.

Table 5: Independent sample t-test on teachers’ perception of mobile learning platforms based on gender

	Gender	N	Mean	Std. Dev	T	df	Sig 2-tail	Decision
To what extent do you believe Mobile Learning Platforms enhance students' learning compared to traditional methods?	Male	94	4.05	.98	0.19	171	0.85	NS Accept HO
	Female	79	4.03	.93				
How confident are you that Mobile Learning Platforms can positively impact students' overall academic engagement and motivation?	Male	94	3.94	.99	0.16	171	0.87	NS Accept HO
	Female	79	3.91	1.03				
In your view, how effective are Mobile Learning Platforms in improving students' reading and writing skills?	Male	94	3.85	1.13	0.86	171	0.39	NS Accept HO
	Female	79	3.71	1.04				

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 5 shows that since all the mean scores are above 3.5, all the teachers irrespective of their gender perceive to a high extent that mobile learning platforms when used for literacy and numeracy instructions can effectively improve the students’ literacy and numeracy skills. The corresponding independent t-test analysis all show that the differences between the mean values of the male and female teachers are not significant at 0.05 level of significance. Hence the hypothesis which states that

there is no significant difference in teachers’ perception of effectiveness of mobile learning platforms in improving students’ literacy and numeracy skills based on gender is accepted.

RQ6: To what extent do educators perceive the effectiveness of mobile learning platforms in improving students’ literacy and numeracy based on highest teaching qualification?

Table 6a: Mean and standard deviation of teachers’ responses on the effectiveness of mobile learning platforms based on highest teaching qualification

Items	Highest qualification	N	Mean	Std. Deviation
To what extent do you believe Mobile Learning Platforms enhance students' learning compared to traditional methods?	NCE	9	3.67	1.22
	First degree	54	3.89	1.021
	Master degree	51	4.10	1.01
	PhD.	59	4.19	0.78
	Total	173	4.04	0.95
How confident are you that Mobile Learning Platforms can positively impact students' overall academic engagement and motivation?	NCE	9	3.89	1.36
	First degree	54	3.83	0.97
	Master degree	51	3.98	0.99
	PhD.	59	3.97	1.02
	Total	173	3.92	1.01
In your view, how effective are Mobile Learning Platforms in improving students' reading and writing skills?	NCE	9	4.22	1.09
	First degree	54	3.61	1.14
	Master degree	51	3.88	1.03
	PhD.	59	3.80	1.08
	Total	173	3.79	1.09

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 6a shows that since all the mean scores are above 3.5, which means that all the teachers irrespective of their highest teaching qualifications perceive to a high extent that mobile learning platforms when used for literacy and numeracy instructions can effectively improve the students' literacy and numeracy skills.

HO<sub>6</sub>: There is no significant difference in teachers' perception of effectiveness of mobile learning platforms in improving students' literacy and numeracy skills based on highest teaching qualification.

Table 6b: ANOVA on differences in the teachers' perception of effectiveness of mobile learning platforms based on highest teaching qualification.

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	52.290	3	17.430	0.914	.435	NS Accept
Within Groups	3221.849	169	19.064			HO
Total	3274.139	172				

The ANOVA analysis in table 6b shows that there is no significant difference in the level of perception of the teachers irrespective of their highest teaching qualification on the effectiveness of the use of mobile learning platforms to improve students' literacy and numeracy skills, ( $F=0.914$ ,  $df=3, 169$ , and significant 2-tail  $=0.435$  which is higher than the accepted value of 0.05. This implies that the hypothesis which states that there is no significant difference in teachers' perception of effectiveness of mobile learning platforms in improving students'

literacy and numeracy skills based on highest teaching qualification is accepted.

RQ<sub>7</sub>: To what extent do educators perceive the effectiveness of mobile learning platforms in improving students' literacy and numeracy based on school ownership?

HO<sub>7</sub>: There is no significant difference in teachers' perception of effectiveness of mobile learning platforms in improving students' literacy and numeracy skills based on school ownership.

Table 7: Independent sample t-test on teachers' perception of the effectiveness of mobile learning platforms based on school ownership

	School ownership	N	Mean	Std. Dev.	T	Df	Sig 2-tail	Decision
To what extent do you believe Mobile Learning Platforms enhance students' learning compared to traditional methods?	Private	54	3.93	.89	-1.06.	171	0.29	NS Accept HO
	Public	119	4.09	.98				
How confident are you that Mobile Learning Platforms can positively impact students' overall academic engagement and motivation?	Private	54	3.96	.85	.034.	171	0.74	NS Accept HO
	Public	119	3.91	1.07				
In your view, how effective are Mobile Learning Platforms in improving students' reading and writing skills?	Private	54	3.70	1.02	.067.	171	0.50	NS Accept HO
	Public	119	3.82	1.12				

Table 7 shows that all the mean scores are above 3.5, which means that all the teachers irrespective of the ownership of the school where they teach, perceive to a high extent that mobile learning platforms when used for literacy and numeracy instructions can effectively improve the students' literacy and numeracy skills. The independent t-test analysis shows that the difference in the mean scores

is not significant with all the p-values higher than 0.05 which is the accepted level of significance. This implies that the hypothesis which states that there is no significant difference in teachers' perception of effectiveness of mobile learning platforms in improving students' literacy and numeracy skills based on school ownership is accepted.

RQ<sub>8</sub>: To what extent do educators perceive the effectiveness of mobile learning platforms in improving students’ literacy and numeracy based on teaching experience?

Table 8a: Mean and standard deviation on teaching experience and teachers’ perception of effectiveness of mobile learning platforms

Items	Teaching experience (years)	N	Mean	SD
To what extent do you believe Mobile Learning Platforms enhance students' learning compared to traditional methods?	1 to 5	34	4.1765	.79661
	6-10	48	3.9583	1.00970
	11-15	31	3.9677	1.11007
	16-20	31	4.1613	.73470
	21 and above	29	3.9655	1.08505
	Total	173	4.0405	.95454
How confident are you that Mobile Learning Platforms can positively impact students' overall academic engagement and motivation?	1 to 5	34	4.0000	.85280
	6-10	48	3.9375	.97645
	11-15	31	3.8710	1.14723
	16-20	31	4.0323	.94812
	21 and above	29	3.7586	1.15434
	Total	173	3.9249	1.00586
In your view, how effective are Mobile Learning Platforms in improving students' reading and writing skills?	1 to 5	34	3.7941	.91385
	6-10	48	3.7708	1.09621
	11-15	31	3.7097	1.24348
	16-20	31	3.9355	1.03071
	21 and above	29	3.7241	1.19213
	Total	173	3.7861	1.08662

Decision rule: Mean of 3 = moderate extent. Therefore, mean 3.5 to 4.5 = high extent.

Table 8a shows that all the mean scores are above 3.5, which means that all the teachers, irrespective of their years of teaching experiences, perceive to a high extent that mobile learning platforms when used for literacy and numeracy instructions can effectively improve the students’ literacy and numeracy skills.

HO<sub>8</sub>: There is no significant difference in teachers’ perception of effectiveness of mobile learning platforms in improving students’ literacy and numeracy skills based on Teaching experience.

Table 8b: ANOVA on teaching experience and teachers’ perception of effectiveness of mobile learning platforms

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	32.784	4	8.196	.425	0.791	NS Accept
Within Groups	3241.355	168	19.294			HO
Total	3274.139	172				

The ANOVA analysis in table 8b shows that there is no significant difference in the level of perception of the teachers irrespective of their years of teaching experiences on the effectiveness of the use of mobile learning platforms to improve students’ literacy and numeracy skills, (F=0.426, df4, 168, and significant 2-tail = 0.791 which is higher than the accepted value of 0.05. This implies that the hypothesis which states that there is no significant difference in teachers’ perception of effectiveness of mobile learning platforms in improving students’ literacy and numeracy skills based on Teaching experience.is accepted.

### III. Summary of findings

The findings are summarized as follows -

1. Teachers, regardless of gender, demonstrate a high and statistically similar level of awareness of mobile learning platforms used for literacy and numeracy instruction.
2. Teachers in both public and private schools show a high level of awareness of mobile learning platforms for literacy and numeracy instruction, with a significant difference in awareness based on school ownership.

3. Teachers exhibit a high level of awareness of mobile learning platforms for literacy and numeracy instruction, with no significant differences based on their highest teaching qualification.
4. Teachers demonstrate a high level of awareness of mobile learning platforms for literacy and numeracy instruction, with no significant differences based on years of teaching experience.
5. Teachers, regardless of gender, strongly perceive that mobile learning platforms effectively enhance students' literacy and numeracy skills, with no significant difference between male and female teachers' perceptions.
6. Teachers, irrespective of their highest teaching qualification, strongly perceive mobile learning platforms as effective for improving students' literacy and numeracy skills, with no significant difference in perception based on qualification level.
7. Teachers, regardless of school ownership, strongly perceive mobile learning platforms as effective for improving students' literacy and numeracy skills, with no significant difference in perception based on school ownership.
8. Teachers, regardless of their years of teaching experience, strongly perceive mobile learning platforms as effective in improving students' literacy and numeracy skills, with no significant differences in perception based on teaching experience.

### Discussion of Results

#### Gender and Awareness of Mobile Learning Platforms

The finding that teachers, regardless of gender, demonstrate a high and statistically similar level of awareness of mobile learning platforms aligns with global research suggesting that gender gaps in basic technology awareness among teachers are narrowing. The present finding is consistent with Amadi and Agbarakwe (2019), who found that secondary school students demonstrated high awareness of mobile learning tools, and that such awareness was not influenced by gender. UNESCO (2018) reports that increasing access to digital technologies and mobile devices has contributed to more equitable digital awareness among educators. Similarly, OECD (2019) findings from TALIS indicate that gender differences in teachers' familiarity with digital tools are often minimal, particularly where institutional support exists. This

suggests professional exposure and systemic integration of digital tools, rather than gender, shape awareness levels.

#### School Ownership and Differences in Awareness

Although teachers in both public and private schools show high awareness, the significant difference based on school ownership may reflect disparities in infrastructure, funding, and institutional support. This pattern aligns with the empirical evidence presented by Akram, Ahmad, and Cheema (2025), who found that private school students reported greater engagement with digital learning practices and tools than students in public schools. The authors suggested that this disparity may result from better technology integration, more structured awareness initiatives, and greater access to digital resources in private school settings. World Bank (2020) highlights that private schools in many developing contexts often have better access to ICT resources compared to public schools. Similarly, UNESCO (2023) emphasizes that digital divides frequently occur along institutional lines, with differences in connectivity, leadership priorities, and investment influencing awareness and exposure levels. Therefore, ownership-related structural factors likely account for the variation.

#### Teaching Qualification and Awareness

The absence of significant differences in awareness based on highest teaching qualification suggests that mobile learning awareness may be driven more by general digital exposure than by formal academic attainment. Punya Mishra and Matthew J. Koehler's TPACK framework (2006) emphasizes that technological knowledge is distinct from content and pedagogical knowledge, meaning higher qualifications do not automatically translate into greater technological awareness. Additionally, OECD (2019) reports that teachers across qualification levels often develop digital awareness through informal and in-service learning opportunities rather than degree attainment alone.

#### Teaching Experience and Awareness

The finding that years of teaching experience do not significantly influence awareness aligns with research indicating that exposure to digital technologies cuts across generational and experiential lines. Neil Selwyn (2009) argues that assumptions about "digital natives" and "digital immigrants" oversimplify actual digital competence patterns. Furthermore, European Commission (2017) in the DigCompEdu framework notes that

professional engagement with technology is influenced more by institutional culture and training than by years in service. This supports the conclusion that awareness is broadly distributed among teachers regardless of experience.

#### Gender and Perceived Effectiveness of Mobile Learning

Teachers' strong and gender-neutral perception of effectiveness corresponds with meta-analytical evidence supporting mobile learning outcomes. Olasedidun, Bola, and Falade (2023) observed that gender did not significantly impact students' perceptions or engagement with mobile learning tools in South-western Nigerian universities. Likewise, Cheung A. and Slavin R. E. (2013) reported that educational technology applications can significantly improve literacy and numeracy outcomes when properly implemented. The absence of gender differences suggests that belief in pedagogical value is shaped by observed instructional benefits rather than demographic variables.

#### Qualification and Perceived Effectiveness

The lack of perceptual differences based on qualification level suggests a shared professional recognition of mobile learning's instructional value. John Hattie (2009) in *Visible Learning* notes that technology-enhanced instruction can produce meaningful gains when aligned with effective pedagogy. Since perception is often influenced by classroom results and peer discourse rather than academic credentials alone, teachers across qualification levels may similarly appreciate mobile learning's benefits.

#### School Ownership and Perceived Effectiveness

Despite awareness differences by ownership, the absence of significant perceptual differences indicates that teachers across institutional contexts recognize the pedagogical value of mobile learning. UNESCO (2013) in its Mobile Learning Policy Guidelines emphasizes the cross-sectoral relevance of mobile technologies in improving literacy and numeracy. Similarly, World Bank (2018) reports that mobile-based literacy and numeracy programmes demonstrate effectiveness across both public and private educational settings, reinforcing a shared belief in their instructional potential.

#### Teaching Experience and Perceived Effectiveness

The finding that perception of effectiveness does not differ by years of experience suggests broad professional consensus. Peggy A. Ertmer (1999) distinguishes between first order (external) and second order (belief-based) barriers to technology integration, noting that once teachers perceive value, demographic factors become less significant. Additionally, OECD (2021) reports that teachers' positive beliefs about digital tools are increasingly widespread across experience levels due to systemic digital integration efforts.

### IV. Recommendations

Educational authorities should sustain and expand inclusive professional development programmes to maintain the high awareness with balanced gender ratio. Targeted interventions should be implemented to bridge the awareness gap between public and private school teachers, ensuring equitable access to information and training on mobile learning platforms. Since awareness is high across qualification levels, policymakers should integrate practical mobile learning competencies into all teacher education programmes to strengthen effective classroom application. Continuous professional development on mobile learning should be regularly provided to teachers at all experience levels to translate awareness into consistent instructional practice. School administrators should leverage the strong positive perception across genders by promoting collaborative implementation of mobile learning platforms in literacy and numeracy instruction.

Furthermore, teacher training institutions and education stakeholders should incorporate hands-on mobile learning integration strategies into both pre-service and in-service training, regardless of qualification level. Education policymakers should support uniform policy guidelines and resource provision across public and private schools to facilitate effective implementation of mobile learning platforms. Mentorship and peer-learning frameworks should be established to encourage teachers of all experience levels to confidently integrate mobile learning platforms into literacy and numeracy teaching.

#### Further Studies

Future research on mobile learning could take many possible dimensions. This study emphasized teachers' awareness and perceptions, but a comparative study across regions could highlight regional disparities in access, training, and infrastructure that affect mobile learning adoption. Similarly, longitudinal research examines how teachers' awareness and perceptions evolve over

time, particularly as mobile learning platforms become more integrated into classrooms could reveal trends in sustained adoption and shifts in attitudes. It would also be good to explore how teachers' awareness and perception of mobile learning platforms translate into actual classroom implementation and student learning outcomes in literacy and numeracy. This could involve mixed-methods research combining surveys, classroom observations, and student assessments. It would also be proper to investigate the effectiveness of targeted professional development programs on improving both awareness and perceived effectiveness of mobile learning platforms, especially in schools with lower resource availability or significant awareness gaps. A study on how factors like school infrastructure, funding, internet connectivity, and administrative support influence teachers' awareness and perceptions of mobile learning platforms, potentially explaining the differences observed between public and private schools would not be out of place.

#### Acknowledgements

Special thanks to the funder, TETFund/NRF, of this research work for the opportunity granted the team to engage in this collaborative research project. The Vice Chancellor of Ignatius Ajuru University of Education, Port Harcourt, Professor Okechuku Onuchuku is highly appreciated for his unflinching support and words of encouragement. The Director, Research and Development Unit, Professor Nduka Wonu, Director, Academic Planning, Professor Joseph Kinanee, with other members of the University Management are warmly applauded. We acknowledge the commitment of other members of this research team because their cooperation this far is commendable, hoping for more as the research work continues.

#### References

- [1]. Achuonye, K. A., Ushie, B. C., & Williams, A. C. (2026). "Barriers And Enablers to The Implementation of Mobile Learning Platforms in Rural Nigerian Education Systems" *Iconic Research and Engineering Journals* Volume 9 Issue 9 2026 Page 1149-1157.
- [2]. <https://doi.org/10.64388/IREV9I9-1715156>
- [3]. Adelore, O. O., &Odedina, A. A. (2025). Perceptions of educational stakeholders toward mobile learning in adult literacy programmes in Ibadan metropolitan area. *International Journal of Literacy and Education*, 12(2), 88–104.
- [4]. Adelore, O. O., &Odedina, J. M. (2017). Perception of facilitators on the introduction of the use of mobile phone for instruction in adult literacy programmes in Ibadan metropolis. *Journal of Humanities, Social Sciences and Creative Arts*, 12(1), 61–70.
- [5]. <https://doi.org/10.51406/jhssca.v12i1.1859>
- [6]. Agarry, R. O., Babalola, M. O., & Jacob, P. A. (2024). Teachers' perception of digital literacy skills as a tool for 21st century teaching in Nigeria. *University of Dar es Salaam Library Journal*, 19(1), 57–69. <https://doi.org/10.4314/udslj.v19i1.5>
- [7]. Akram, R., Ahmad, M., & Cheema, A. B. (2025). Comparing the digital learning practices in public and private schools. *Qlantic Journal of Social Sciences*, 6(3), 149–159. <https://doi.org/10.55737/qjss.vi-iii.25395>
- [8]. Amadi, A. C., &Agbarakwe, H. A. (2019). Awareness of secondary school students' usage of mobile devices for learning. *International Journal of Educational Technology and Learning*, 6(1), 17–21. <https://doi.org/10.20448/2003.61.17.21>
- [9]. Bacolod, D. B. (2022). Mobile learning as a solution for restricted learning during the COVID-19 pandemic. *Journal of Digital Educational Technology*, 2(1), ep2203. <https://doi.org/10.21601/jdet/11584>
- [10]. Cheung, A., & Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K–12 classrooms: *A meta-analysis*. *Educational Research Review*, 9, 88–113.
- [11]. Ekwu, U. S., Njoku, C. N., Ikwuanusi, E. N., & Madu, O. (2025). Mobile-based learning and STEM education in Nigerian classrooms: Opportunities and challenges in the 21st century. *Faculty of Natural and Applied Sciences Journal of Mathematics and Science Education*, 6(4), 36–47.
- [12]. Ertmer, P. A. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47–61. <https://doi.org/10.1007/BF02299597>
- [13]. Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge. <https://doi.org/10.4324/9780203887332>

- [21]. Jumare, M. H., & Shehu, T. (2025). Evaluation of the role of mobile technology in enhanced learning and research in North-West universities of Nigeria. *Jalingo International Journal of Library and Information Science*, 1(1), 84-97.
- [22]. <https://oer.tsuniversity.edu.ng/index.php/jjilis/article/download/947/695/1882>
- [23]. Kayode, B. K., Alabi, A. T., Sofoluwe, A. O., & Oduwaiye, R. O. (2015). Constraints to the use of information and communication technology in Nigerian secondary schools. *Unilorin Administration and Planning Journal*, 1(1), 12–21.
- [24]. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- [25]. Musa, M. A., & Amshi, J. M. (2024). Mobile learning in higher education: An empirical investigation of technology and skills factors. *Nigerian Journal of Computing, Engineering and Technology*, 3(1), 204–216.
- [26]. OECD. (2019a). *OECD skills outlook 2019: Thriving in a digital world*. OECD Publishing. <https://doi.org/10.1787/df80bc12-en>
- [27]. OECD. (2019b). TALIS 2018 results (Volume I): *Teachers and school leaders as lifelong learners*. OECD Publishing.
- [28]. <https://doi.org/10.1787/1d0bc92a-en>
- [29]. Organisation for Economic Co-operation and Development. (2021). *OECD digital education outlook 2021: Pushing the frontiers with artificial intelligence, blockchain and robots*. OECD Publishing. <https://doi.org/10.1787/589b283f-en>
- [30]. Olasedidun, O. K., Bola, O. O., & Falade, A. A. (2023). South-western Nigerian university students' gender use of mobile technologies for learning. *Shodh Sari — An International Multidisciplinary Journal*, 2(4), 1–14. <https://doi.org/10.59231/SARI7620>
- [32]. Onuba, J. C. (2025). Mobile learning as an emerging instructional approach for flexible and accessible education. *International Journal of Educational Technology and Innovation Research*, 9(1), 15–29.
- [33]. Pedraja-Rejas, L., Muñoz-Fritis, C., Rodríguez-Ponce, E., & Laroze, D. (2024a). Digital leadership and the use of ICT in the classroom: An analysis from the perspective of school teachers. *Journal of Educational Computing Research*, 61(8), 1745–1768.
- [34]. <https://doi.org/10.1177/07356331231183354>
- [35]. Pedraja-Rejas, L., Muñoz-Fritis, C., Rodríguez-Ponce, E., & Laroze, D. (2024b). Mobile learning and its impact on student learning outcomes and critical thinking: Evidence from technology-enhanced educational environments. *Educación XXI*, 27(3).
- [36]. <https://doi.org/10.24193/ed21.2024.27.03>
- [37]. Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu* (Y. Punie, Ed.). Publications Office of the European Union. <https://data.europa.eu/doi/10.2760/159770>
- [38]. Salawu, S. A., Ameen, K. S., & Adeniji, S. M. (2023). Senior school mathematics teachers' awareness and perceptions of ICT resources for teaching and learning. *Jurnal Pendidikan Matematika Universitas Lampung*, 11(1), 29–42. <http://dx.doi.org/10.23960/mtk/v11i1.pp29-42>
- [39]. Santas, T., Ogbesoh, A. T., & Gago, S. J. (2025). Digital technology adoption and instructional continuity: Examining the role of mobile phones in the Nigerian post-pandemic classroom. *Media and Communication Review*, 5(1), 44–62.
- [40]. Santas, T., Udende, P., Inobemhe, K., & Modeyin, O. (2025). Teachers' perception of the adoption of digital technologies for e-learning during Covid-19 pandemic in Nigeria. *Journal of Education Method and Learning Strategy*, 3(01), 104–119.
- [41]. <https://doi.org/10.59653/jemls.v3i01.1413>
- [42]. Selwyn, N. (2009). The digital native — myth and reality. *Aslib Proceedings: New Information Perspectives*, 61(4), 364–379.
- [43]. <https://doi.org/10.1108/00012530910973776>
- [44]. Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3–10. [http://www.itdl.org/Journal/Jan\\_05/article01.htm](http://www.itdl.org/Journal/Jan_05/article01.htm)
- [45]. UNESCO. (2013). *Policy guidelines for mobile learning*. United Nations Educational, Scientific and Cultural Organization.
- [46]. <https://unesdoc.unesco.org/ark:/48223/pf0000219641>
- [47]. UNESCO. (2018). *UNESCO ICT competency framework for teachers*. United Nations Educational, Scientific and Cultural Organization.

- [48]. <https://unesdoc.unesco.org/ark:/48223/pf0000295373>
- [49]. UNESCO. (2023). *Global education monitoring report 2023: Technology in education – A tool on whose terms?* UNESCO Publishing.
- [50]. <https://unesdoc.unesco.org/ark:/48223/pf0000385723>
- [51]. World Bank. (2018). *World development report 2018: Learning to realize education's promise*. World Bank Group.
- [52]. <https://doi.org/10.1596/978-1-4648-1096-1>
- [53]. World Bank. (2020). *Innovation in education: Improving learning outcomes through ICT technology*. World Bank.
- [54]. <https://hdl.handle.net/10986/34034>
- [55]. Yakar, Z., Kılıç, A., & Yılmaz, M. (2020). Constructivist learning theory in practice: The role of interaction, experience, and social engagement in
- [56]. knowledge construction. *Journal of Education and Learning*, 9(2), 1–10.