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Educational Barriers and Mobile Learning Prospects in Rural Nigerian Schools: A Multi-Stakeholder Perspective in Ogun Sate Nigeria

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Abstract: The Nigerian education system has been characterized by educational disparities between the rural and urban schools that has presented a barrier to accessing quality education because of poor infrastructure, lack of teaching facilities and a lack of qualified teachers. Although there has been an increasing access to mobile technologies, its role in rural education has not been extensively used. This paper has explored the potential of mobile learning as a tool of enhancing school performance in rural learning institutions in Ogun State, Nigeria. The quantitative cross-sectional survey design was used whereby purposive sampling was used to choose 113 respondents who included students, teachers and community members. Structured questionnaires were used to collect the data and conducted descriptive and inferential statistics. The results have shown that despite the confidence of students in the learning process, significant problems like inefficient infrastructure, inadequate access to learning resources, a lack of digital literacy, and high-priced internet access exist. Nevertheless, there was a positive attitude of teachers and community members to mobile learning adoption. The findings also showed that mobile learning has the potential to improve the accessibility to learning materials, flexibility, and inclusive learning. The research comes to the conclusion that mobile learning can be used to supplement traditional teaching in rural schools. Stakeholders are advised to invest in offline learning platforms, infrastructural improvements, and increase the capacity to digitalize in order to have successful implementation.

Keywords: *Mobile Learning, Rural Education, Digital Inclusion, Educational Technology, Nigeria.*

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I. INTRODUCTION

The Nigerian education system is already facing a crisis of historic scale where it is estimated that there are 20.2 million children who are out of school (UNESCO, 2022). This is an astonishing number that ranks as the third highest in the world, further exacerbated by a lack of infrastructure, which is inherent in the system, and which makes conventional classroom education more and more challenging to support in underserved regions (Dele-Ajayi & Fasae, 2024; United Nations, 2022). Although the Nigerian government through the National Policy on Education has long held the view that Information Technology was a crucial means of supporting skills in the knowledge-based world, the reality has been blocked by a consistent digital divide (Ajayi et al., 2023; Federal Republic of Nigeria, 2013). Students in rural areas, where more than three-fifths of the population dwell, can be found in a relatively backward state, with poverty and the absence of access to even basic technological facilities (Eme et al., 2023; Okoye et al., 2023).

One of the main educational problems in these areas is the electricity-education nexus. The number of people who do not have access to the national power grid is about 92 million Nigerians, and rural residents are the worst affected (Nano, 2022; Punch, 2022). According to empirical evidence, in such a place as Ogun state, almost half of the population considers their power supply to be poor, and they frequently receive under five hours of electricity per day (Badejo et al., 2020). This unstable energy does not allow charging mobile devices and is directly linked to the low rates of school enrollments and grade-for-age disparities among children (Nano, 2022). Moreover, in rural schools they often do not have basic physical amenities, including safe physical structures or even classes being taught outside, and some are made of mud blocks (Afonyaa-Harry and Akpan, 2025; Du Plessis and Mestry, 2019).

Rural schools in Nigeria have a severe lack of qualified and ICT-literate teachers (Olatunde-Aiyedun & Ogunode, 2021). According to the reports, almost 90 percent of primary schools do not have a special computer instructor, and many of those that do are not ready to go to a remote area because of low living standards and the absence of professional growth opportunities (Attah, 2021; Ogunode & Abiola, 2021). This human resource mismatch frequently culminates in the introduction of so-called multi-grade teaching, in which one teacher is required to teach multiple subjects and grades at the same time, which is too much of a load and severely affects the quality of instruction (Du Plessis & Mestry, 2019). Also, educators in these institutions tend to experience a pedagogical-technological disconnect and perceive mobile devices as a distraction in the classroom instead of a strategic option of learner-centered teaching (Masasi, 2023; Sepadi et al., 2025).

Another formidable challenge to both the teachers and students in the rural Ogun State is digital literacy. Technology is also not accessible to many students as their parents are equally underprivileged technologically and cannot offer them support (Amos, 2019; Musa, 2019). Rural farming households mentioned poor technical knowledge, very high data prices, and unstable networking as serious limitations even in the presence of mobile technology (Ewebiyi, 2018; Nicholson et al., 2024). This is also complicated by the fact that there are no localized and cultural relatable digital content; the curricula are often adjusted to the standards of the city, and it is presented in English, which many rural students consider a foreign language, which further creates a hindrance to successful understanding (Afonyaa-Harry & Akpan, 2025; Du Plessis & Mestry, 2019).

Mobile learning (m-learning) has become an attractive opportunity to overcome such traditional barriers with the help of handheld devices which are becoming more and more ubiquitous even in low-resource environments (Kaisara & Bwalya, 2022; Okai-Ubaje et al., 2020). Nonetheless, to enable the sustainability of technology adoption, it should go beyond a one-size-fits-all solution and consider the local contextual factors of cultural relevance and community readiness (Afonyaa-Harry & Akpan, 2025; Sepadi et al., 2025). The research bridges the research gap in the current study by adopting a multi-stakeholder perspective involving students, teachers and community leaders in Ogun State. It provides insight into key technical and pedagogical barriers, offering a structured, evidence-based approach to the deployment of mobile learning for advancing digital equity in rural Nigeria.

- *Statement of the Problem*

In most of the rural areas in Nigeria, education remains to be influenced by the persistence of inequalities that put students and teachers at a disadvantage over their counterparts in the urban areas. Rural schools in Ogun State are faced with a mixture of poor learning conditions, lack of qualified teachers, lack of access to learning resources and exposure to digital technologies. These issues do not merely interfere with classroom practice, they slowly undermine the motivation of students, limit the ability of teachers to provide quality education, and increase learning gap between rural and urban students.

Despite the increased use of mobile technologies in Nigeria, their potential applications in the teaching and learning in rural schools have not been exploited fully. The use of simple devices by students and teachers in communication, entertainment or informal learning purposes is not well understood, but little is known on whether or not these devices can be considered reliable and sustainable substitutes to traditional learning materials in the rural areas. More to the point, the opinions of those who undergo the

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challenges, students, teachers, school leaders, parents, and community stakeholders are not heard that much in the context of how mobile learning can be implemented or facilitated in these communities.

Lack of a multi stakeholder, multi-faceted comprehension of these barriers poses a knowledge gap. In the absence of concrete information about what the educational and instructional challenges are in rural schools, and what realistic opportunities mobile learning can present, attempts to implement digital solutions may be ill-informed, unsustainable, and ineffective. The question of concern then is what real obstacles students and teachers encounter in their day to day lives and how mobile learning can possibly be incorporated into their real-life experiences.

This paper is aimed at discussing the principal educational and teaching issues in rural schools of Ogun State, Nigeria and the possibility of implementing mobile learning model as a viable way to overcome the problem. The research aims at tapping into the vision of various stakeholders including students, teachers, school administrators, parents and community members in an attempt to create a comprehensive and contextual image of the impediments to teaching and learning. The research will also identify how far the mobile learning tools would go in facilitating the instructional delivery process, the accessibility of learning as well as the overall learning experience in rural schools in Nigeria through this needs assessment.

➢ *Significance of the Study*

- Contribution to Knowledge: The paper provides new knowledge to the field of education in rural Nigerian communities in that it reports the realities of teaching and learning that influence the day-to-day activities. It offers information that is based on local experiences thus contributing to the literature on the existing literature on rural education, digital inclusion, and mobile learning in developing situations.
- Policy and Educational Planning: The results will be of use to the policy-makers both in the state and federal levels particularly those in charge of basic education and ICT integration. The study has provided the practical advice to be applied to the policy, funding model, and interventions design by providing the evidence of several stakeholders that directly address the needs of the rural schools.
- Aid to Teachers and School Administrators: Teachers and school leaders will have a better vision of specific obstacles that curb a successful instruction. The generated insights can be used in informing the school level planning, professional development programmes and strategies of integrating the mobile learning in the normal day teaching practices.
- Practical Use to EdTech Developers: Technology developers, telecom providers, and mobile learning designers will find useful the results of the study about the accessibility of devices, readiness of the users, and constraints of the context. This allows coming up with solutions that are not only innovative but are also designed to the reality of the rural learners.
- Community and Social Impact: The end result of the study is the voices of rural families and communities, which attracts the attention to the social and economic aspects defining the learning outcomes. The research can help enhance the overall endeavors to equity, inclusion, and better learning opportunities among the underserved populations by suggesting viable avenues of mobile supported education.

II. LITERATURE REVIEW

➢ *Conceptual Review*

Mobile learning (m-learning) is described as any type of educational delivery that involves the use of portable wireless technological devices (smartphones, tablets, feature phones) in supporting learning in a variety of settings using social and content interactions (Traxler, 2018; Sharples, 2000). It is a change of the inactive, physical learning place to an omnipresent learning space where one can receive the material without time or place (Traxler, 2018). In resource-strained countries such as Nigeria, the idea of m-learning is becoming known as seamless learning, with personal mobile devices being the learning centres that help connect the gap between formal education and life in the field (Ugwu, et al., 2025).

The FRAME (Framework of the Rational Analysis of Mobile Education) model describes the features of m-learning as the combination of three elements, which are the device (physical features and usability), the learner (prior knowledge and cognitive skills) and the social factor (interaction and collaboration) (Koole, 2009). The key m-learning affordances in rural settings are:

- Flexibility: Allowing students who have agricultural or household duties to study not according to the strict school time schedules (Cavus & Al-Momani, 2011).

- Accessibility: The presentation of the content through mobile broadband to remote regions where the physical infrastructure (ICT laboratories or libraries) does not exist (Olanrewaju et al., 2021).

- Personalization: Mathis promotes learner-focused pedagogy when students learn at their speed and get access to information according to their literacy levels (Okai-Ugbaje et al., 2022).

The Nigerian education system has defined rurality The concept of rurality in the Nigerian education system is geographical remoteness, lack of population density and high levels of lack of basic social amenities (Adejare, 2024). The schools within such regions are usually faced with educational starvation which is the situation of schools being under-invested in terms of instruction facilities and being under-invested in terms of modern facilities (Onikoyi et al., 2025). Poverty in rural regions is high, usually above 52, and hence formal education tends to be second to the survival of an economy (National Bureau of Statistics, 2022).

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➢ *Theoretical Framework*

The implementation and subsequent adoption of mobile technologies in rural schools are studied in the framework of the established models of technology acceptance and social diffusion;

Technology Acceptance Model (TAM): The Technology Acceptance Model (TAM) is a model that assumes that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the determinants of the intention to use a new technology (Davis, 1989; Keston & Sule, 2024). In rural Nigeria, PU would mean the degree to which the stakeholders are of the view that m-learning can reduce the effects of geographical location and enhance academic achievement. PEOU is essential since the lack of digital literacy that is characteristic of rural areas requires that mobile tool should be straightforward and easy to use to be adopted (Ajani & Ngema, 2024).

Unified Theory of Acceptance and Use of Technology (UTAUT): UTAUT includes such constructs as social influence and facilitating conditions (Venkatesh et al., 2003; Muraina et al., 2025). This framework will be especially applicable to the process of explaining how access to infrastructure like solar charging hubs or cheaper mobile data and community pressure determines the success of m-learning initiatives (Ugwu, et al., 2025).

The DOI Rogers theory of diffusion of innovations describes the process of the spread of new technological ideas within a social system depending on their relative advantage and compatibility (Rogers, 2003). To be effective in its diffusion within Ogun State, the border communities, m-learning should be viewed as more effective than traditional forms of didactical practises and aligned to the local socio-cultural values (Ugwu, et al., 2025).

➢ *Contextual Review, Education and Technology in Ogun State/Nigeria*

Ogun State has traditionally been considered as one of the best educational centres in Nigeria and it is known to excel in intellectual excellence (Onikoyi et al., 2025). Nevertheless, secondary schools operated by the state are extensively under-funded, and in most cases, they receive much less than the 26-percent of the budget that UNESCO recommends should be allocated to the education sector (Onikoyi et al., 2025). This disparity in finances leads to unrefined classrooms and insufficient laboratories or computer centres in the country (Adejare, 2024).

Although the National Policy on ICT in Education should lead to digital literacy, the realisation of the policy in rural Ogun State is negated by access issues with the material and the unstable power system (Dosumu, 2024; Agbajeola et al., 2025). Digital projects at the state level usually are not able to cover the distance between cities and border communities and often remote locations where educators are reluctant to work there because of the lack of social resources and low quality of life (Adejare, 2024; Afonyaa-Harry and Akpan, 2025).

➢ *Empirical Review: Educational and Instructional Problems*

According to the empirical evidence, various significant educational and instructional issues of the rural students and teachers are identified:

- Infrastructural and Technical Deficits: The most severe one is the erratic or non-existent electricity. Nigeria has many rural schools that do not have access to the national grid; this means that they cannot use computers regularly or even charge mobile devices without some form of other energy (Dosumu, 2024; Olanrewaju et al., 2021). Additionally, lack of internet connectivity and high bandwidth in isolated locations avoid the usage of real-time virtual learning platforms or downloading of massive instructional materials by the students (Agbajeola et al., 2025).

- Economic and Socio-Cultural Barriers: The rural populations are too poor to finance the prohibitive pricing of smartphones or the frequency cost of internet data (Oseghale & Babarinde, 2025). Many families in the cultures suffer the problem of giving up their education to labour them in the fields to engage in subsistence farming or hawking in the streets (Jokodola, 2025; Olanrewaju et al., 2021).

Human Resource Constraints A shortage of skilled teachers in the rural areas has always been a problem. Most teachers do not want to work in isolated communities where there are bad road systems and low chances of career development (Adejare, 2024). Also, current teachers usually are technologically unprepared, considering mobile devices as annoying distractions instead of justifiable pedagogical resources (Okai-Ugbaje et al., 2022).

➢ *Summary and Research Gap*

The literature confirms that even though mobile learning is a means of going beyond geographical boundaries, its implementation in rural Nigeria is at a standstill due to a multi-dimensional grid of infrastructural and economical sources. Although research on m-learning is supported worldwide, there exists a mismatch in needs assessment of Ogun State that incorporates all the perspectives of the students, teachers and people leaders at the same time. This paper helps to bridge this gap because it gives empirical findings of a multi-stakeholder evaluation to inform future policy

III. METHODOLOGY

➢ *Design/Procedure*

The research took the quantitative, cross-sectional survey research design to conduct a systematic study of the stakeholder opinion regarding the adoption of mobile learning within a rural Nigerian learning setting. The quantitative method was suitable in producing the numerical data, which could be used to measure the access to technology, instructional issues, and attitudes toward mobile learning among various respondent groups within one time frame.

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The research was conducted in one of the rural communities in Ogun State, southwestern Nigeria, Igbesa. Igbesa is a classic example of a rural community with low educational facilities, low access to digital resources, and socio-economic issues that are generally rural in the nation. The target population comprised three major stakeholder categories that formed part of the main ecosystem, which include pupils studying in the local schools, classroom teachers, and community members such as traditional leaders, religious leaders, and the general residents of the community whose values and dispositions affect the practices of education and technology acceptance in the community.

A purposive sampling method was applied to the selection and recruitment of participants who had first-hand information or significant impact on the educational environment within the study society. This non-probability method was used because it guaranteed that the responses were elicited among people who would be able to give contextually rich and relevant information that would be related to the study objectives. A total of 113 respondents were taken as the sample, including 67 students, 21 teachers, and 25 members of the community. This multi-group design was critical in being able to have a holistic view of the educational environment and the conditions under which mobile learning integration can be made viable.

The questionnaires used to collect the data were three researcher-designed questionnaires, namely, the Cross-Country Students Needs Assessment Survey in Africa (CCSNASA), Cross-Country Teachers Needs Assessment Survey in Africa (CCTNASA), Cross-Country Community Members Needs Assessment Survey in Africa (CCCNASA). All the instruments were divided into the thematical parts that touched upon the respondent demographics, access to mobile devices and digital infrastructure, current educational challenges, the perception of and attitudes towards mobile learning, and features that were deemed required to implement it successfully. Everything was put in the form of declarative statements with a four-point Likert scale with response choices on the Strongly Agree, Agree, Disagree, and Strongly Disagree. The middle ground option of response was omitted specifically to get definitive directional answers of the participants and to reduce the issue of response acquiescence bias.

Before the full-scale administration, the instruments were pilot tested using a sample size that was a subset of the target population to assess the clarity, understanding and internal consistency of the items. Cronbach alpha was used to measure reliability that gave coefficients of 0.70 to the student instrument, 0.75 to the teacher instrument and 0.72 to the community member instrument. These points are in line with the acceptable limits of the exploratory social science research and validated the appropriateness of each tool to the target measurement objective.

The data were collected by using the structured in-person administration of the questionnaires, performed within a specific period of time. The researcher went to schools and community gathering sites that were participating in the research in Igbesa to start the distribution of the instruments to the respondents. Verbal clarification of items was done where necessary to make sure the participants with different literacy levels were able to access the items. In the case of the pupil respondents, the researcher got administrative consent of the school management prior to getting informed consent of the students involved in the study with a clear understanding of the purpose of the study and the voluntary character of student participation.

The participants who took part in the survey as members of the community gave verbal consent before filling out the survey. Anonymity was ensured during the data collection process; no personally identifiable information to the data collection process was requested except simple demographic information. The researcher was also available throughout the administration periods to respond to questions and ensure that the best quality and quantity of information is received.

At the end of the data collection, the responses were coded and typed into an IBM SPSS 23. All demographic variables as well as each Likert-scale item of the three respondent groups computed descriptive statistics (frequencies, percentages, means, and standard deviations). Based on these analyses, dominant trends of technology access, educational issues and stakeholder attitudes of mobile learning were characterized. Inferential statistical tests which included chi-square tests and independent samples t-tests were used where a comparison between groups was justified with the level of significance at $p < .05$.

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IV. ANALYSIS AND DISCUSSION

- *Research Question: What are the Major Educational and Instructional Challenges Faced by Students and Teachers in Rural Schools?*

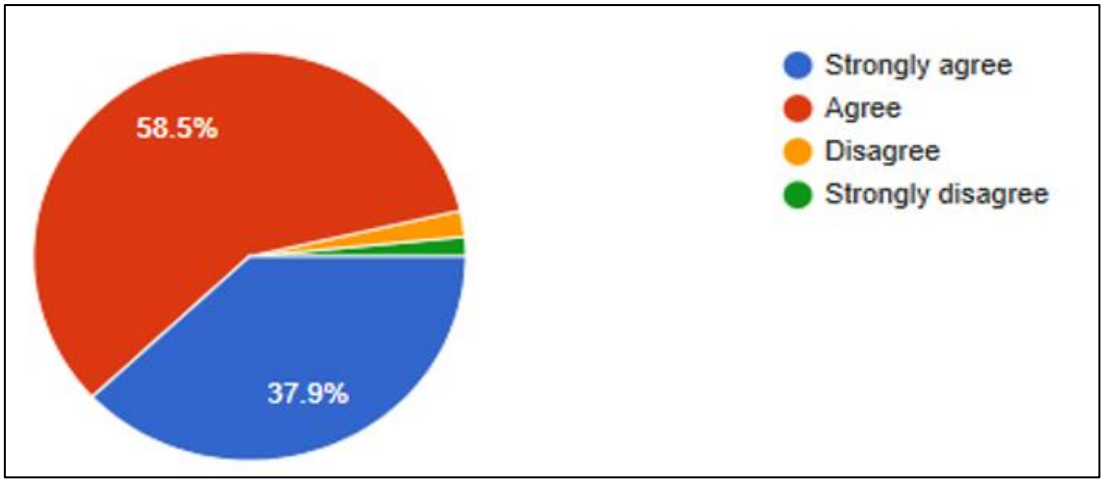

Fig 1 Inadequate Digital Infrastructure Limits the Effective Integration of Learning Technologies
Source: Field Work Survey, 2026.

Figure 1 presents respondent perceptions about whether poor digital infrastructure is an obstacle to successful integration of learning technologies in rural school. The results indicate a huge impact of a positive response: 58.5% of the respondents chose to say Agree, and another 37.9% of the respondents chose to say Strongly Agree, which indeed comprises more than 96% of the respondents in favor. There was little opposition and the Disagree, Strongly disagree is only a minor part of the distribution. These results are a strong reinforcement of the story of infrastructural deficit that has been built up over the course of this research. The fact that this statement is supported almost unanimously by the stakeholders in the Igbesa community reveals that the limiting impact that poor digital infrastructure can have on technology-based learning is directly felt and perceived by the stakeholders in the Igbesa community. This is in line with the existing empirical sources that report that in many rural Nigerian schools, computer laboratories, reliable electricity, and ICT devices are usually absent to sustain digital learning in schools (Dosumu, 2024; Olanrewaju et al., 2021). The sheer agreement in Figure 1 has a point that the infrastructural barrier is not only a policy issue conceived but an everyday, lived-in experience of teachers and students alike. However, according to Technology Acceptance Model (TAM), low level of infrastructure directly reduces Perceived Ease of Use (PEOU) as a zero level of willingness of the user cannot balance the lack of functional devices and connectivity (Davis, 1989). Moreover, in the UTAUT conceptualization, the lack of proper facilitating conditions, i.e such as the availability of reliable power supply and the availability of the device in question is also cited as a core hinder to the adoption of technology (Venkatesh et al., 2003). The high score in Figure 1 thus indicates that any mobile learning intervention, in this situation, should focus on the baseline infrastructure investment such as solar-powered charging systems as well as provisioning of the device before attempting to get any pedagogical adoption.

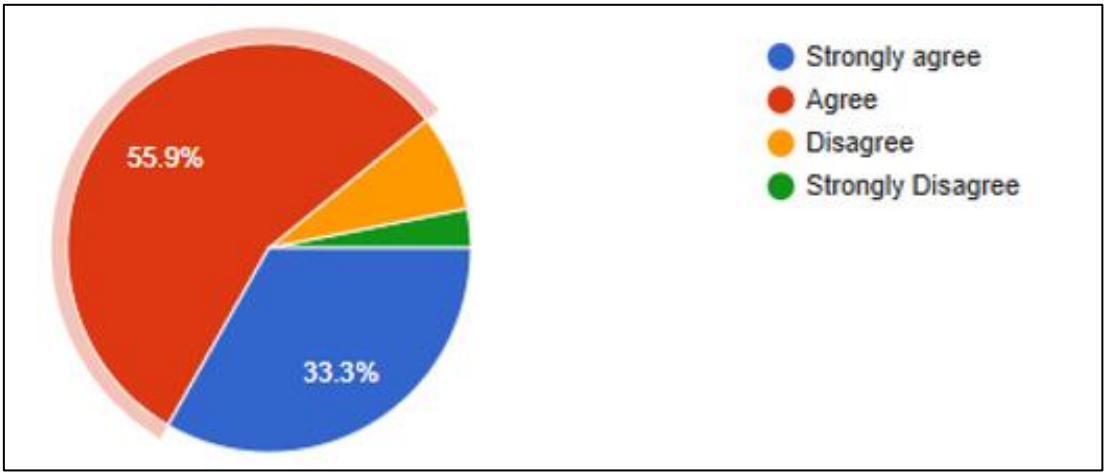

Fig 2 The High Cost of Acquiring and Maintaining Digital Tools Restricts their Use in Computer Science Education
Source: Field Work Survey, 2026.

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Figure 2 addresses the economic aspect of the digital divide, namely, the high price of the purchase and upkeep of digital tools is a limitation to their application in computer science education. There is once again a high positive score with 55.9 per cent of the respondents agreeing and a high proportion of 33.3 per cent strongly agreeing with the distribution giving an overall endorsement of about 89 per cent. There was still a little disagreement, meaning that it was extremely low since only a very low percentage of the respondents believed that cost does not matter. These findings can be explained by the socio-economic status of the Igbesa population and the entire rural Nigerian environment, in which poverty levels often rise above 52 percent, and people have little to no one to invest in digital equipment or data-plan (National Bureau of Statistics, 2022; Oseghale and Babarinde, 2025). The cost barrier is also not contained only in the initial cost of the device, but extends to the cost of maintenance and repairs as well as the periodical cost of internet data bundle, which continues to be prohibitive to most rural families and school administrators (Ewebiyi, 2018; Nicholson et al., 2024). More importantly, the cost finding helps to confirm the idea of mobile-first low-cost solutions like feature-phone-compatible platforms/digestible, feature-phone-compatible applications and offline-enabled applications, which reduce data dependency (Kaisara & Bwalya, 2022). Figure 2, with which the agreement rate is almost 90 percent, once again questions the diffusion of mobile learning in sub-Saharan Africa as simply a matter of technology: in places where gear is available, the lack of a means to purchase it can make it another barrier to education. This highlights the critical need of community-level initiatives such as subsidised device programs, the use of public- private partnerships as facilitating factors to equitable implementation of mobile learning among the community such as Igbesa.

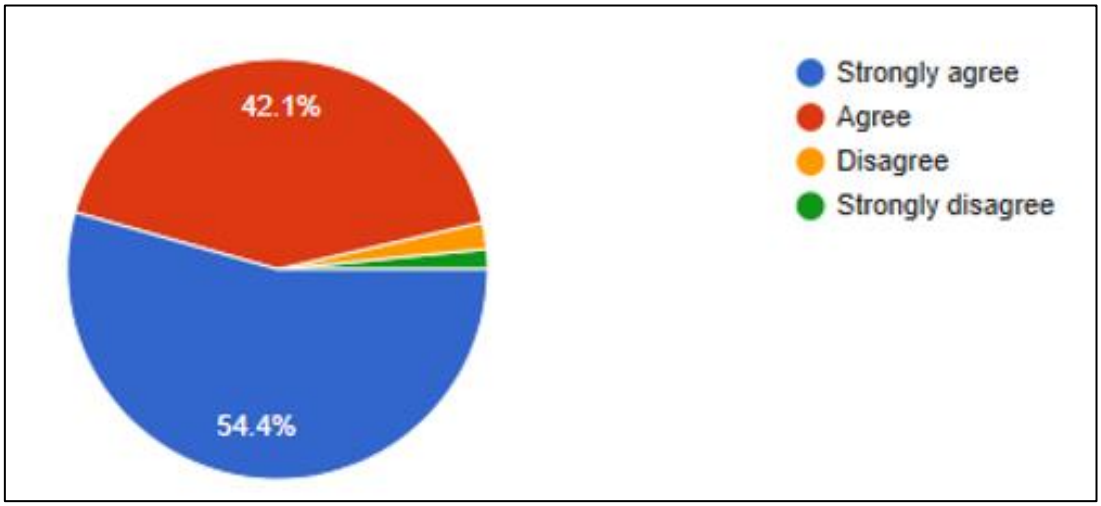

Fig 3 Poor or Unstable Internet Connectivity Negatively Affects the Implementation of Digital Learning
Source: Field Work Survey, 2026.

Figure 3 is likely the least controversial of all the 4-item agreement rates: 54.4% of the participants strongly concurred and 42.1% concurred that bad or bad WIFI connectivity is bad in facilitating digital learning resulting in an overall agreement rate of more than 96. Importantly, the majority of responses here is made up of the Strongly Agree responses- a sign that is not an element of dispassionate acceptance, but of strong emotion that is based on a sustained personal experience. This result is especially valuable in the context of the general patterns of access to the internet in rural Ogun State, where the lack of good network coverage and unstable mobile coverage has been thoroughly reported (Agbajeola et al., 2025; Dosumu, 2024). The conviction power seen in the Figure 3 data illustrates a population with repeated efforts to connect with digital resources being thwarted due to lack of connectivity. This perception pattern is theoretically significant: in the context of the TAM, the tendency of repeatedly experiencing failures due to connectivity gradually diminishes both Perceived Ease of Use and Perceived Usefulness of digital learning resources, thus making the intention to use them less likely to occur (Davis, 1989; Ajani and Ngema, 2024). Furtherwards, Rogers Diffusion of Innovations theory would assume that technologies that are viewed as unreliable will be faced with increased resistance in the adoption process because the early adopters will be transferring negative experience in the social networks (Rogers, 2003). The massive consensus in Figure 3 thus has a valid design implication: any feasible mobile learning system to support communities such as Igbesa would have to work effectively within an offline or the low-bandwidth environment. Internet-reliant synchronous platforms will not sustainably gain uptake, but asynchronous, downloadable content-repositories and SMS-based system of learning is more contextually pertinent (Ugwu et al., 2025).

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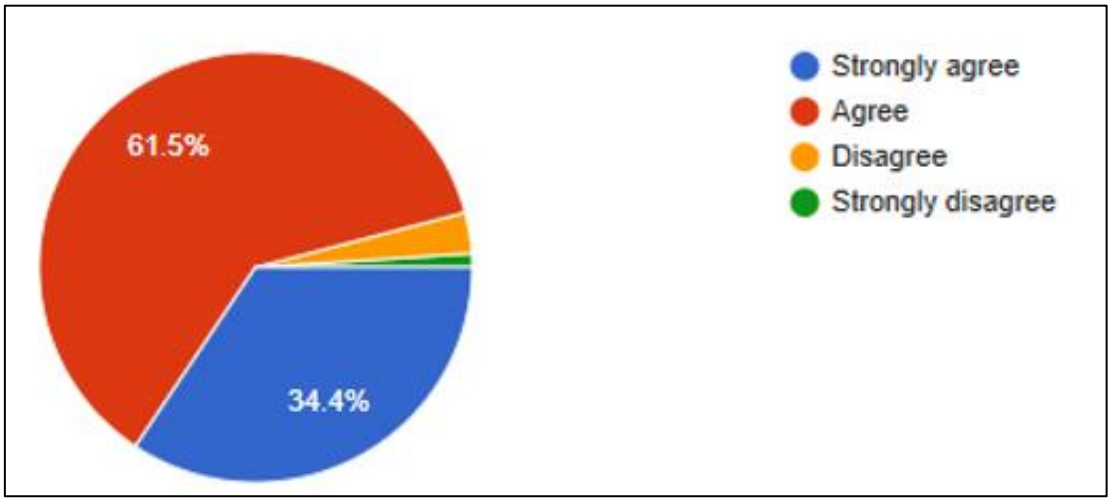

Fig 4 Limited Digital Skills Among Educators Hinder the Adoption of Emerging Learning Technologies
Source: Field Work Survey, 2026.

Figure 4 shift is away of the external infrastructural barrier and towards the human resource aspect of the digital challenge. The results indicate that 61.5% of participants concurred and 34.4% strongly concurred with the argument that insufficient digital abilities among teachers impair the uptake of the new learning technologies with a cumulative agreement rate of over 95%. The only minority that disagreed was a small number. The result is particularly consequential as teacher digital competency is a key factor between the available technology and positive classroom practice. The pedagogically untrained teachers, in turn, will unlikely use digital tools in the ways that could have a significant impact on the learning outcomes in even those schools where devices are available and Internet connectivity does not pose a problem (Masasi, 2023; Sepadi et al., 2025). That the majority on whether to agree or disagree with the statement (61.5 percent) is the highest of any individual category of all four figures) implies that the lack of the provision of digital teacher preparation is widely perceived as a system-wide challenge and not a personal failure. This aligns with literature sources on the empirical research performed that has recorded that most of the rural primary schools in Nigeria do not have specific ICT teachers, and that many of the teachers in such educational establishments perceive mobile phones not as teaching tools but as a nuisance in the classroom (Olatunde-Aiyedun & Ogunode, 2021; Okai-Uxbaje et al., 2022). Notably, this Figure 4 result is also indicative of the outcomes of Tables 6 and 7 in the preceding segment of this section: although community members are quite favourable of mobile learning programmes, the willingness of teachers to adopt this programme is a weakness of the structure that needs a specific intervention. In TAM, low teacher digital self-efficacy decreases Perceived Usefulness and Perceived Ease of Use of educational technologies, and instills a disposition of avoidance that contradicts the adoption of any institutional policy even when there are top-down policy requirements (Keston and Sule, 2024). The only way to address this dimension is through long-term context sensitive, practical, school based, professional development programme, which is anchored on the daily pedagogical issues in the rural school environment.

V. FINDINGS

Collectively the information shown in Figures 1 to 4 create a harmonious, self-perpetuating image of the academic and learning issues that both learners and educators face in the rural schools of Igbesa, Ogun State. The digital infrastructure, cost of devices, internet connectivity, and educator digital skills survey items all received over 89% agreement, with two of the items (Figures 1 and 3) scoring over 96 percent. These extremely high levels of consensus across multiple aspects of the same issue show that the impediments to digital learning in this community are not individual or sporadic but a complex and interrelated issue.

Of interest is the sequentially increasing character of such barriers. Negative infrastructural conditions (Figure 1) provide the underlying factors whereby cost limitations (Figure 2) further limit access to devices. The situation is worse in areas where there is some degree of access to devices but bad connectivity (Figure 3) makes the use of such a device useless in online learning. Lastly, even in cases where the digital learning process theoretically would be possible due to infrastructure and connectivity, the lack of adequate educator digital skills (Figure 4) would make the pedagogical possibilities of mobile technology a reality. This cascaded approach reflects the multi-layered barrier framework reported in the literature on m-learning in sub-Saharan Africa in which technology, economics, and human factors interact in a cascading manner to result in highly embedded digital exclusion (Kaisara and Bwalya, 2022; Ugwu et al., 2025).

The tendency of the answers of all four figures also implies much to inform the design of the mobile learning interventions. The great percentage of the Strongly Agree answers at least in Figures 3 and 4 are the indication of not only intellectual cognition of the issue, but also experience of frustration amongst stakeholders. This implies that any solution which is proposed to m-learning will have minimal acceptance unless they can show how they are solving these two areas of pain. The introduction of supplementary internet-reliant information through interventions without addressing the connectivity issues currently faced is likely to

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cause further decrease in stakeholder trust and decrease the buy-in of the community identified as a key asset in this study (see Table 7). The fact that the community is ready to facilitate mobile learning programmes, as shown by the unanimous assent in Table 7 is a social capital stock that has to be wisely drained out with technically-based, environmentally customized solutions as opposed to broad-cutter digital implementations.

The results are largely in line with comparative studies in rural education settings of sub-Saharan Africa. Research in Kenya, Uganda, Tanzania, and South Africa has also found insufficient infrastructure, the price of devices, and unreliable connectivity and teacher reluctance as the most predominant factors impeding technology adoption in under-resourced schools (Ajani and Ngema, 2024; Du Plessis and Mestry, 2019; Masasi, 2023; Sepadi et The alignment of the Igbesa data with this larger, regional data is another indicator of the external validity of the present study results and is indicative of a larger, structural trend of digital exclusion that requires multi-level policy action, and not school-based interventions. In this sense, the figures in Figures 1 to 4 altogether present a strong argument that technology delivery by itself can never lead to effective mobile learning in rural schools in Nigeria: they need to complement this with the provision of power infrastructure, inexpensive connectivity, low-cost device ecosystems and the ability to build solid digital capacity building of teachers.

VI. CONCLUSION

The paper gives a practical insight into the realities that define teaching and learning in the Nigerian rural schools, especially at Ogun State. The results question the generalized assumptions regarding the lack of learning in rural settings by indicating that a lot of students show confidence in the comprehension of classroom training and mathematics. But with this relative confidence, there is still a structural limitation, in particular, the access to learning material, an infrastructural shortage, and other socio-economic factors that restrict the fair access to quality education

Notably, the paper shows that the learning problems in rural settings are not academic only but are rooted in the overall systemic factors like poverty, lack of digital access, and poor policy practices. The skewed nature of the mobile devices and ambivalent attitudes towards the needs in technology further portray the intricacy of integrating digital interventions in these environments.

Irrespective of these limitations, the high desire by the community members to fund the mobile learning programs is a window of opportunity. This is an indication of collective preparedness that the notion of sustainable educational innovation in rural settings should not focus on the provision of infrastructure alone but the participation of the local stakeholders in the process of design and implementation. The success of mobile learning will be determined by its perceived usefulness, ease of use, cultural relevance, and compliance with local realities as is the case with the existing theoretical models (Davis, 1989; Venkatesh et al., 2003; Rogers, 2003).

On the whole, the paper highlights that mobile learning should not be viewed as an independent intervention but a supportive channel that, when put in the context of proper positioning, can be used to fill the existing knowledge gaps in education and enhance digital equity in underserved populations.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are hereby presented:

- *Integration of Mobile-Based Educational Materials*

Mobile-based educational resources such as digital textbooks and open educational resources should be provided to supplement existing learning materials. This will help address the unequal access to instructional resources that students currently experience, particularly in rural school settings where the shortage of learning materials remains a persistent challenge.

- *Offline Functionality of Mobile Learning Platforms*

Mobile learning platforms intended for use in rural communities should be designed or configured to function without a stable internet connection. This will ensure that students with limited or inconsistent internet access are not left out of digital learning opportunities, making mobile education more inclusive and accessible to all learners regardless of their connectivity situation.

- *Infrastructure Support Through Alternative Energy Solutions*

Given the persistent electricity challenges in many rural communities, policymakers and stakeholders should explore and invest in alternative energy solutions such as solar-powered charging stations. Providing reliable access to power is essential to ensuring that students and teachers can consistently use digital devices for learning and instruction.

- *Teacher Capacity Building and Professional Development*

Continuous professional development programmes should be established to strengthen teachers' digital skills and their ability to effectively integrate mobile technologies into classroom instruction. Equipping teachers with the necessary competencies will bridge the gap between available technology and its meaningful application in teaching and learning.

- *Community-Driven Implementation Strategies*

Local stakeholders and community members should be actively involved in the planning and implementation of mobile learning programmes. Given that community members have demonstrated strong support for such initiatives, their participation will foster a sense of ownership, ensure cultural relevance, and contribute to the long-term sustainability of mobile learning interventions.

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➢ *Policy Coherence and Targeted Funding*

Government bodies and education authorities should strengthen the enforcement of ICT-in-education policies and prioritize funding allocations toward rural schools. Closing the digital divide between rural and urban areas requires deliberate, consistent, and long-term policy commitment rather than short-term or isolated interventions.

➢ *Localization of Content and Language Inclusiveness*

Mobile learning content should be adapted to reflect local languages and cultural contexts. Ensuring that instructional materials are culturally relevant and linguistically accessible will significantly improve student comprehension, engagement, and overall interest in learning, particularly among rural learners who may feel disconnected from standardized or urban-centered content.

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