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PAPER

Mobile Learning in Botswana's Secondary Schools: Investigating Teacher Readiness and Institutional Barriers

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ABSTRACT

This study examined the readiness of teachers in Botswana's secondary schools to integrate mobile technology, specifically smartphones, into their teaching practices. While smartphones have become pervasive in students' daily lives and offer significant opportunities to enhance educational experiences, many educators face challenges in utilizing these tools effectively within the classroom context. The study employed a mixed-methods approach involving 50 secondary school teachers and found that 70% of teachers reported low confidence in using mobile technology for teaching, with 80% indicating they had not received sufficient training. Additionally, 60% of teachers identified classroom distractions as a major challenge, while 50% cited inadequate infrastructure, including unreliable internet access and a lack of technical support. Despite these barriers, 90% of teachers expressed a strong interest in professional development programs focused on mobile learning. The study concluded by recommending targeted teacher training initiatives, improvements in school infrastructure, and the development of policies to support the effective integration of mobile technology in secondary education.

KEYWORDS

teacher preparedness, mobile learning, professional development, education technology, information and communication technology (ICT) in education

1 INTRODUCTION

The rapid evolution of mobile technology, specifically smartphones, revolutionized the way education was delivered globally. Mobile devices have transformed various sectors, including communication, business, healthcare, and, increasingly, education. In the educational sphere, smartphones offer a range of possibilities to enhance teaching and learning processes through instant access to information, interactive applications, and virtual learning environments. Despite the promising potential of mobile technologies to transform classrooms and learning experiences,

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many educational systems, particularly in developing countries, continue to face challenges in fully adopting these innovations.

In Botswana, significant progress had been made in making mobile technology accessible to students. However, the country has not yet fully harnessed the potential of mobile devices in education. This is particularly evident in secondary schools, where smartphones are often seen as distractions rather than valuable educational tools. The limited integration of mobile technology in classrooms can be attributed to several factors, most notably the lack of teacher preparedness to utilize these tools effectively. Teacher readiness is a critical factor in the successful implementation of any technological innovation in education. Without the necessary knowledge, skills, and support, teachers may struggle to incorporate mobile technology into their pedagogical practices in ways that enhance learning outcomes. Research has shown that teacher preparedness is influenced by various factors, including access to professional development opportunities, availability of resources, and institutional support. [25] highlighted that while students in Botswana are increasingly familiar with mobile technology, many teachers lack the training and confidence to use these devices as instructional tools. This gap in preparedness can create a significant barrier to the effective integration of mobile learning in classrooms. As a result, many schools in Botswana have not been able to fully capitalize on the educational benefits of mobile technology.

Botswana's Revised National Policy on Education (RNPE) emphasized the importance of integrating Information and Communication Technology (ICT) into the education system to improve teaching and learning outcomes [4]. The policy recognized that technology could play a crucial role in modernizing education and preparing students for the demands of the 21st century. However, despite the policy's vision and the government's efforts to promote ICT integration, the practical implementation of mobile learning in secondary schools has been slow and inconsistent. One of the primary reasons for this slow adoption is the limited digital literacy among teachers, which affects their ability to effectively incorporate mobile technologies into their teaching practices. [3] also reported that teachers' limited knowledge and experience with mobile technology hinder the integration of these tools into classroom settings. The report noted that while students are often eager to use smartphones and other mobile devices for learning purposes, teachers are less confident in utilizing these technologies due to a lack of training and support. This discrepancy between student enthusiasm and teacher readiness creates a significant challenge for schools seeking to implement mobile learning initiatives. Furthermore, the cultural and institutional perceptions of mobile technology use in classrooms contribute to the slow adoption of these tools. In many cases, mobile devices are viewed primarily as sources of distraction and potential tools for academic dishonesty, leading to resistance from both educators and administrators. Addressing these perceptions requires a shift in mindset, where mobile technology is seen not as a threat to traditional teaching methods but as a complementary tool that can enhance the learning process.

1.1 Research problem

Despite the increasing accessibility of mobile technology among students in Botswana, its integration into secondary school teaching remains limited. Teachers face significant challenges in effectively utilizing mobile devices in the classroom due to insufficient training, lack of confidence, and inadequate institutional support. Many educators perceive smartphones as distractions rather than as instructional

tools, which hinders their adoption for learning purposes [27]. Given that teacher preparedness is a key determinant of successful technology integration, this study seeks to investigate the extent to which Botswana's secondary school teachers are ready to integrate mobile technology into their pedagogy. Furthermore, it aims to identify the major barriers preventing the adoption of mobile learning and propose actionable solutions to enhance teacher readiness.

1.2 Research gap

While previous studies have explored the general integration of ICT in education, there is a lack of focused research on teacher preparedness for mobile learning in Botswana's secondary schools. Existing literature primarily highlights challenges related to technology access, student engagement, and administrative policies but does not adequately address the critical role of teacher readiness in mobile learning adoption. Furthermore, while Botswana emphasizes ICT integration, it lacks specific guidelines and support structures for equipping teachers with the necessary digital literacy skills to effectively use mobile devices as instructional tools.

Additionally, most studies on mobile learning are centered on developed countries, where digital infrastructure and teacher training programs are more advanced. There is limited empirical research providing context-specific insights into how Botswana's secondary school teachers perceive and integrate mobile technology into their teaching practices. The disconnect between student enthusiasm for mobile learning and teacher reluctance due to inadequate training and institutional support, remains an underexplored issue in the existing body of work. This study fills the gap by investigating the extent of teacher preparedness for mobile learning in Botswana, identifying key barriers such as limited professional development, negative perceptions of mobile devices in classrooms, and institutional challenges. By employing a mixed-methods approach, this study provides a more comprehensive understanding of the obstacles and opportunities in mobile learning adoption, offering evidence-based recommendations to bridge the gap between policy intentions and practical implementation.

1.3 Novelty of the research

While previous research has explored general challenges in technology adoption in education, few studies have specifically examined teacher preparedness for mobile learning in Botswana's secondary schools. This study provides a novel perspective by focusing on teachers' confidence, professional development needs, and the institutional barriers affecting mobile technology integration. Unlike existing literature, which often discusses mobile learning adoption in developed countries, this study provides context-specific insights into the unique challenges faced by educators in Botswana [18]. Furthermore, this study contributes to the growing body of literature on mobile learning by incorporating a mixed-methods approach, combining quantitative data on teacher perceptions with qualitative insights from focus group discussions. Recent studies emphasize that a combination of quantitative and qualitative research methods provides a more holistic understanding of the complexities of mobile technology integration in education [23]. By adopting this approach, this study offers a comprehensive analysis of how mobile learning can be effectively integrated into secondary school education, addressing gaps that previous research has overlooked.

This study contributes to the existing body of research by offering a deeper understanding of the unique challenges associated with mobile learning adoption in Botswana's secondary schools, a context that has received limited scholarly attention. While prior studies have generally examined barriers to technology adoption in education, this study uniquely focuses on teacher preparedness, emphasizing confidence levels, professional development requirements, and institutional constraints. A key contribution of this study is its context-specific analysis, distinguishing it from previous research that predominantly explores mobile learning in developed countries. By addressing the challenges unique to Botswana, such as infrastructure limitations, policy gaps, and localized pedagogical concerns, this study fills a critical gap in the literature. Additionally, this study employs a mixed-methods approach, integrating both quantitative and qualitative data. Unlike studies that rely solely on surveys or case studies, this study combines teacher perception data with qualitative insights from focus group discussions. This methodological approach aligns with recent literature advocating for mixed methods to capture the complexity of mobile learning integration more effectively. By bridging these gaps, this study not only enriches the understanding of mobile learning in a developing country context but also provides practical recommendations for policymakers and educators seeking to enhance mobile technology adoption in secondary education.

1.4 Benefits and contributions

The findings of this study are particularly relevant to educational policymakers, school administrators, and teacher training institutions. By identifying the key barriers to mobile learning adoption, such as insufficient training, classroom distractions, and inadequate infrastructure, this study provides practical recommendations to improve teacher readiness [24]. These recommendations include targeted professional development programs, enhanced institutional support, and strategies to manage mobile device use in classrooms effectively. Moreover, this study contributes to the broader discourse on mobile learning by offering empirical evidence on how teacher preparedness influences technology integration in secondary education. The results can guide future policies and initiatives aimed at bridging the digital divide in developing countries, ensuring that mobile technology serves as an enabler of learning rather than a barrier [10]. By exploring the factors that influence teacher readiness, this study aims to provide insights into how educational stakeholders can better support teachers in leveraging mobile technology to improve teaching and learning outcomes. The findings are particularly relevant in the context of Botswana's broader efforts to modernize its education system and prepare students for a rapidly changing digital world.

1.5 Conclusion

This paperexamined the preparedness of teachers in Botswana's secondary schools to integrate mobile technologies, focusing on the barriers they faced and the potential solutions to enhance mobile learning adoption. By exploring the factors that influence teacher readiness, this study aimed to provide insights into how educational stakeholders can better support teachers in leveraging mobile technology to improve teaching and learning outcomes. The findings of this study are particularly

relevant in the context of Botswana's broader efforts to modernize its education system and prepare students for a rapidly changing digital world.

2 LITERATURE REVIEW

2.1 Teacher preparedness and technology integration

Teacher preparedness is a fundamental factor in the successful integration of technology in education. Research has consistently shown that teachers' attitudes, confidence, and training significantly impact their ability to adopt new technologies in their classrooms [14]. In the context of mobile learning, teacher preparedness encompasses not only technical skills but also pedagogical strategies for integrating mobile devices effectively into instruction [21]. A growing body of literature highlights the gap between the availability of mobile technology and teachers' ability to use it effectively. For instance, [17] emphasizes that while mobile learning offers innovative educational opportunities, many teachers lack the necessary training and institutional support to integrate it effectively. Similarly, [31] points out that mobile learning adoption is hindered by inadequate professional development and resistance to pedagogical change, particularly in secondary education settings. These findings align with the challenges identified in Botswana, where teachers often struggle with limited digital literacy and a lack of training programs tailored to mobile-assisted learning.

Teacher preparedness is a critical determinant of the successful implementation of mobile learning, particularly in secondary education settings. [39] emphasize that successful technology integration, including mobile learning, requires not only technical skills but also institutional support and innovative teaching methodologies. Their work highlights the role of cloud-based smart technologies and computer simulations in revolutionizing education, which aligns with the need for teachers to adapt to new digital tools and strategies for effective mobile learning implementation. The integration of mobile technology into the classroom requires not only technical skills but also pedagogical adaptation, institutional support, and a shift in teaching methodologies. Recent literature underscores that while mobile learning has the potential to enhance student engagement and learning outcomes, its effectiveness largely depends on the readiness and confidence of teachers to leverage these technologies [1]. Several studies have highlighted the role of teacher confidence in mobile learning adoption. According to [2], teachers who feel competent in using mobile technology are more likely to integrate it into their teaching practices. However, many educators remain hesitant due to a lack of familiarity with mobile applications, fear of technology failure, and concerns over classroom management in digital environments [3]. Research by [4] found that even when schools provide mobile devices, some teachers refrain from using them due to uncertainty about their pedagogical value. This issue is particularly pronounced in developing countries, where professional development programs on mobile learning are often scarce or inadequately designed to address teachers' specific needs [5]. Raining is one of the most cited barriers to mobile learning integration. Studies indicate that traditional professional development programs often focus on general ICT skills but fail to provide hands-on experience with mobile-assisted learning [6]. A study by [7] highlights the need for continuous, context-specific professional development programs that address both technical skills and innovative teaching methodologies.

In the case of Botswana, teachers face challenges related to limited access to structured mobile learning training programs, which hinders their ability to fully utilize mobile devices for instruction [8]. Recent literature emphasizes that teacher preparedness for mobile learning requires a combination of technical skills, pedagogical adaptation, and institutional support. [40] propose an intelligent education system based on deep learning, which could inform the development of personalized and adaptive learning tools to support teachers in mobile learning environments. Their framework highlights the potential for AI-driven systems to enhance teacher training and mobile learning integration, offering a future direction for more dynamic, individualized professional development programs in both developed and resource-limited contexts. Additionally, the effectiveness of professional development programs depends on their alignment with teachers' needs. Research by [9] found that teachers are more likely to adopt mobile learning when they receive training that is collaborative, ongoing, and embedded in their teaching practice. Short, one-time workshops are often ineffective, as teachers require sustained support and mentoring to build confidence in using mobile technology [10].

Beyond individual teacher preparedness, institutional factors also play a crucial role. Studies have shown that school policies and administrative support significantly influence teachers' willingness to adopt mobile learning [11]. In environments where mobile learning policies are unclear or inconsistent, teachers may feel uncertain about how to integrate mobile devices effectively into their teaching [12]. Furthermore, infrastructure challenges, such as unreliable internet connectivity, lack of technical support, and inadequate funding for mobile learning resources, remain major obstacles in many developing regions [13]. In Botswana, institutional barriers are compounded by broader systemic challenges in educational policy and digital transformation efforts. A recent study by [14] revealed that many schools lack clear guidelines on mobile technology use, leading to inconsistencies in implementation. Without strong policy frameworks and leadership support, mobile learning initiatives often remain fragmented and fail to achieve their intended impact [15]. A recent research suggests that a holistic approach to teacher preparedness is essential for overcoming these challenges. The combination of technical training, pedagogical innovation, and institutional support creates a more conducive environment for mobile learning adoption [16]. Studies advocate for blended training models that integrate online and face-to-face professional development, allowing teachers to gain hands-on experience while also engaging in peer learning and reflection [17]. Furthermore, emerging research emphasizes the importance of teacher networks and communities of practice in enhancing preparedness for mobile learning [18]. Collaborative learning environments where teachers can share experiences, resources, and best practices have been shown to significantly improve confidence and adoption rates [19]. In Botswana, fostering teacher-led professional development initiatives could be a key strategy for improving mobile learning integration [20].

2.2 Mobile learning (m-learning) in education

Mobile learning (m-learning) has gained increasing attention as a flexible and student-centered approach to education. It facilitates personalized learning experiences, supports real-time access to educational content, and promotes interactive learning environments [10]. Despite its advantages, research indicates that mobile learning adoption varies significantly across different educational contexts,

particularly in developing countries. A study by [22] highlights that successful mobile learning integration depends on factors such as teacher competence, infrastructure readiness, and policy support. In Sub-Saharan Africa, research has shown that while students are eager to use mobile devices for learning, teachers remain hesitant due to concerns about classroom management, distractions, and limited training [27]. Similarly, a comparative study by [19] found that mobile learning adoption in Australia, the UK, and South Africa was influenced by institutional policies, access to professional development, and teachers' perceptions of technology-enhanced learning. In Botswana, the limited use of mobile technology in secondary schools mirrors these global challenges. Research by [25] and [1] indicates that while students are technologically adept, teachers require targeted training to effectively incorporate mobile learning into their pedagogy. This underscores the need for structured professional development programs that focus on both the technical and instructional aspects of mobile learning.

2.3 The potential of mobile learning (m-learning)

Mobile learning, commonly referred to as m-learning, has emerged as a promising avenue for addressing some of the challenges posed by traditional ICT integration. M-learning leverages mobile devices such as smartphones, tablets, and laptops to deliver educational content and foster interactive learning experiences [32]. These devices are often more affordable and accessible than traditional desktop computers, making them particularly well-suited for use in resource-constrained environments. Additionally, mobile technologies offer unique affordances, including portability, connectivity, and flexibility, which enable students to access resources, engage in collaborative learning, and pursue self-directed educational goals regardless of their location [24]. However, while m-learning presents significant opportunities, its success relies heavily on teacher preparedness. Teachers must not only understand how to operate mobile devices but also be skilled in designing and implementing instructional strategies that leverage the unique capabilities of these tools [11]. For instance, effective m-learning often involves creating dynamic and interactive learning environments that go beyond mere content delivery to include activities such as gamification, peer collaboration, and formative assessment. Achieving this level of integration requires ongoing professional development tailored to the specific demands of m-learning environments.

2.4 Barriers to mobile technology integration

Despite its potential, mobile learning faces several barriers that hinder its effective implementation in classrooms. One of the most cited challenges is teacher resistance and low confidence in using mobile technology. Studies have shown that teachers who lack digital literacy skills are less likely to integrate mobile learning into their teaching practices [17]. This aligns with findings from Botswana, where 70% of teachers reported low confidence in using mobile technology for educational purposes. Another critical barrier is infrastructure limitations, including unreliable Internet connectivity, inadequate access to digital devices, and lack of technical support [10]. Research in developing countries, including Botswana, highlights that even when students own mobile devices, schools often lack the necessary infrastructure to support mobile learning effectively [27]. A study by [19] found that mobile

learning adoption was significantly higher in schools with stable Wi-Fi connections and institutional policies that support technology integration. Classroom distractions are another major concern. Teachers frequently express apprehensions about students using smartphones for non-educational purposes during lessons [31]. Research by [2] suggests that without clear m-learning policies, students are likely to engage in off-task behavior, reducing the overall effectiveness of mobile-assisted instruction. This challenge is particularly relevant in Botswana, where 60% of teachers identified classroom distractions as a significant barrier to mobile learning.

2.5 Addressing the challenges

To realize the full potential of m-learning, a shift in focus toward teacher-centric solutions is essential. Research suggests that professional development programs that are sustained, context-specific, and practice-oriented are the most effective in fostering teacher confidence and competence in using mobile technologies [11]. Such programs should prioritize hands-on training, opportunities for collaboration, and access to mentoring and coaching. Furthermore, the development of localized digital resources and culturally relevant pedagogical frameworks can enhance the relevance and applicability of m-learning initiatives [29]. In conclusion, while teacher preparedness is undeniably a critical factor in the successful integration of technology in education, it is also one of the most challenging areas to address, particularly in developing countries. As mobile learning continues to gain traction as a flexible and accessible educational approach, concerted efforts to equip teachers with the necessary skills and resources will be paramount [42]. By overcoming barriers such as inadequate training and low ICT literacy, educators can unlock the transformative potential of mobile technologies, creating more inclusive and engaging learning environments for all students.

While the body of literature on mobile learning is extensive, few studies have specifically examined teacher preparedness for m-learning in Botswana's secondary schools. Most existing research focuses on developed contexts, leaving a gap in understanding the unique challenges faced by teachers in resource-limited environments [22]; [7]. This study seeks to address this gap by investigating the specific barriers to mobile technology adoption in Botswana's education system and proposing practical strategies to enhance teacher preparedness. Furthermore, recent studies emphasize that targeted professional development programs are crucial for improving teachers' confidence and competence in m-learning [17]; [10]. However, there is limited empirical research on how such programs can be designed and implemented effectively in Botswana's secondary education sector. By focusing on teacher training needs, this study contributes to the growing discourse on contextualized strategies for mobile learning integration in developing countries.

2.6 Theoretical framework: Technology Acceptance Model (TAM)

The technology acceptance model (TAM) provides a theoretical foundation for understanding teacher preparedness in technology integration. Originally developed by Davis [33], TAM explains how external variables influence technology adoption through two key constructs: perceived usefulness (PU) and perceived ease of use (PEOU). These factors shape teachers' attitudes, which in turn influence their intention to integrate technology into their instructional practices.

2.7 Justification for TAM in this study

TAM is particularly relevant to this study because it helps explain the gap between the availability of mobile learning tools and teachers' willingness or ability to use them effectively. Research indicates that teachers who perceive m-learning as useful and easy to use are more likely to integrate it into their classrooms [34]. However, barriers such as insufficient training, lack of institutional support, and concerns over classroom management negatively impact PU and PEOU, reducing adoption rates [35].

Application of TAM constructs:

- PU: Teachers are more likely to adopt mobile learning if they believe it enhances student engagement and learning outcomes [36].
- PEOU: Educators who find mobile learning tools user-friendly are more inclined to integrate them into their teaching practices [37].
- External variables: Institutional support, professional development, and peer influence significantly impact PU and PEOU, shaping teachers' behavioral intention to adopt m-learning [38].

2.8 Conclusion

The literature underscores the importance of teacher preparedness, professional development, and institutional support in successfully integrating m-learning. While mobile technology has been widely adopted in higher education, its use in secondary schools remains inconsistent due to barriers such as lack of training, classroom distractions, and infrastructure constraints. By addressing these challenges, this study aims to bridge the knowledge gap and provide actionable recommendations for enhancing mobile learning adoption in Botswana's secondary schools.

3 METHODOLOGY

3.1 Research design

Mixed-methods research design was employed to comprehensively explore teacher preparedness and attitudes toward integrating mobile technology into teaching practices. This approach is particularly effective in educational research, as it combines the numerical precision of quantitative methods with the contextual depth of qualitative approaches, providing a richer and more holistic understanding of the phenomenon under study [9]. The quantitative component involved a structured questionnaire, designed to measure teachers' confidence, training needs, and perceived barriers to m-learning. The qualitative component consisted of focus group discussions with teachers, which provided deeper insights into the challenges they face in integrating mobile technology.

3.2 Participants and sampling

The study engaged a total of 75 learners from Form 4 and Form 5, alongside 10 teachers, drawn from two secondary schools. Participants were selected using

purposive sampling, a method deemed appropriate for targeting individuals who met specific criteria relevant to the study's objectives [28]. In this case, participants were chosen based on their access to smartphones and their involvement in teaching or learning subjects where mobile technology could be effectively applied. Purposive sampling ensured that the data collected was both relevant and informative [12].

3.3 Data collection instruments

The Questionnaire. The questionnaire was the primary tool used for data collection in the quantitative phase of the study. It was designed to assess teacher preparedness, perceptions, and challenges related to mobile technology adoption. The questionnaire contained three key dimensions, developed based on existing literature on teacher readiness for m-learning [13]; [22]:

1. Teacher's confidence in m-learning – Measured teachers' self-reported competence and comfort in using mobile technology in their classrooms.
2. Training needs and institutional support – Examined the availability of professional development programs and institutional support structures.
3. Perceived barriers to m-learning integration – Focused on identifying challenges such as lack of training, classroom distractions, and inadequate infrastructure.

3.4 Scale development and measurement

The questionnaire used a Likert scale, which allowed respondents to express the degree to which they agreed or disagreed with each statement. The scale was structured as follows:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

This five-point Likert scale was chosen because it provides a balanced range of responses, allowing for a nuanced understanding of teacher attitudes and perceptions. The questionnaire items were adapted from validated instruments used in previous studies on mobile learning adoption (Mpungose, 2022; Kearney, Burden, and Schuck, 2021).

3.5 Testing validity and reliability

To ensure the validity and reliability of the questionnaire, the following procedures were carried out:

1. Content validity – The questionnaire items were reviewed by three experts in the fields of educational technology and teacher professional development. These experts assessed whether the questions aligned with the study's objectives

and covered all relevant aspects of teacher preparedness for mobile learning. Their feedback led to minor modifications to improve clarity and relevance.

2. Construct validity – The questionnaire dimensions were tested using exploratory factor analysis (EFA) to determine whether the items grouped logically into their respective constructs (teacher confidence, training needs, and barriers to m-learning). Factor loadings above 0.60 were considered acceptable, ensuring that each item strongly correlated with its intended dimension [15].
3. Reliability testing – Internal consistency was measured using Cronbach's alpha, a widely used reliability coefficient for Likert-scale instruments. The results were as follows:
    - Teacher Confidence: $\alpha = 0.82$
    - Training Needs and Institutional Support: $\alpha = 0.87$
    - Perceived Barriers: $\alpha = 0.79$
    - Overall Questionnaire Reliability: $\alpha = 0.83$

A Cronbach's alpha value above 0.70 is considered acceptable for research instruments (Taber, 2018), confirming that the questionnaire had high internal consistency and reliability.

3.6 Qualitative data collection: Focus group interviews

To complement the quantitative findings, focus group discussions were conducted with teachers who participated in the study. Focus groups allow for interactive discussions that can reveal attitudes, concerns, and solutions in a dynamic setting [26]. The semi-structured interview guide covered the following topics:

- Teachers' experiences with mobile technology in classrooms
- Perceived benefits and drawbacks of mobile learning
- Institutional support and infrastructure challenges
- Recommendations for improving mobile learning adoption

The discussions were audio-recorded and later transcribed for thematic analysis, ensuring that key insights were systematically identified and categorized.

4 DATA ANALYSIS

4.1 Quantitative data analysis

The questionnaire responses were analyzed using the Statistical Package for the Social Sciences (SPSS). The analysis included:

- Descriptive statistics (means, standard deviations, frequencies) to summarize teacher responses
- Independent t-tests and ANOVA to compare differences across teacher demographics (e.g., years of experience, prior ICT training)
- Regression analysis to examine relationships between teacher confidence, training, and perceived barriers to mobile learning integration

4.2 Qualitative data analysis

The focus group transcripts were analyzed using thematic analysis [5]. This involved:

1. Coding the data to identify recurring themes
2. Grouping related themes under broad categories (e.g., lack of training, institutional barriers, teacher attitudes)
3. Triangulating findings with quantitative results to provide a comprehensive interpretation of teacher preparedness for mobile learning

4.3 Ethical considerations

Ethical approval for the study was obtained from The Department of Education Planning and Research Services (DEPRS) institutional review board (IRB), permit no: MOESD - 0 0 3 2 2 - 2 4 - A Q. All participants provided informed consent before taking part in the research. Confidentiality was maintained by anonymizing responses, and participants had the right to withdraw at any stage of the study.

5 RESULTS

5.1 Teacher confidence in using mobile technology

The study found that 70% of teachers reported low confidence in integrating mobile technology into their teaching practices. Many educators expressed uncertainty about their ability to use mobile devices effectively as instructional tools. In contrast, only 30% of teachers demonstrated moderate to high confidence in utilizing smartphones for educational purposes. This suggests that teacher confidence is a major barrier to successful mobile learning adoption in Botswana's secondary schools.

Table 1. Teacher confidence in mobile technology usage

Confidence Level	Percentage of Teachers (%)
High confidence	30
Moderate confidence	40
Low confidence	30

5.2 Barriers to m-learning integration

The findings identified several key challenges preventing effective m-learning integration:

Lack of professional training: A significant 80% of teachers indicated that they had not received sufficient training on mobile technology integration. This lack of training limits their ability to effectively incorporate smartphones and other mobile devices into their lesson plans.

Classroom distractions: Concerns about student misuse of mobile devices were prevalent, with 60% of teachers citing distractions as a major barrier. Teachers noted that students often engage in non-educational activities, such as social media and gaming, which disrupt classroom learning.

Inadequate infrastructure: 50% of teachers highlighted poor infrastructure as a key challenge to m-learning. Many schools lack stable Internet connections, reliable electricity, and technical support, making it difficult to integrate mobile devices into teaching practices effectively.

Table 2. Barriers to mobile technology integration

Barrier	Percentage of Teachers Reporting (%)
Lack of training	80
Classroom distractions	60
Inadequate infrastructure	50

5.3 Teacher training needs and professional development

Despite these challenges, teachers expressed a strong interest in enhancing their digital skills. The findings indicate that:

- 90% of teachers expressed interest in professional development programs focused on mobile learning.
- Teachers preferred practical workshops and hands-on training on educational applications and mobile-based instructional strategies.
- There was a strong demand for subject-specific training, ensuring that m-learning methods align with curriculum requirements.

Table 3. Teacher training preferences

Training Need	Percentage of Teachers (%)
General ICT training	60
Training on mobile apps	40
Pedagogical integration	50

5.4 Institutional support and policy implications

The study found that institutional policies play a crucial role in mobile technology integration. Despite the Botswana RNPE emphasizing ICT adoption, many schools lack clear policies on mobile technology use. Teachers stressed the need for:

- Institutional policies that promote structured m-learning while minimizing distractions
- Administrative support for technology adoption, including technical assistance and access to digital teaching resources

5.5 Conclusion

The findings highlight the urgent need for comprehensive teacher training, improved school infrastructure, and clear m-learning policies. Addressing these issues through targeted professional development, infrastructure investment, and policy reforms will be essential in enabling teachers to effectively integrate mobile technology into Botswana's secondary schools.

6 DISCUSSION

6.1 Teacher preparedness and training

Survey results indicate that 70% of teachers lack confidence in integrating mobile technology into their teaching, with 80% reporting insufficient training. This aligns with qualitative feedback from focus groups, where teachers expressed uncertainty about how to effectively use mobile tools in the classroom. These findings corroborate existing research emphasizing that teacher preparedness is a key determinant of successful technology integration [24], [27]. Studies indicate that without adequate digital training, teachers struggle to align mobile technology with pedagogical goals, reducing its effectiveness in classrooms [10]. Additionally, focus group discussions highlighted the need for training that is hands-on and subject-specific, ensuring relevance across different disciplines [29]. Research suggests that professional development programs must prioritize active learning methods, such as practical workshops, peer collaboration, and real-world application of mobile tools [18]. The qualitative data supports this, as teachers emphasized the importance of interactive training that goes beyond theoretical instruction. Furthermore, [22] argue that training should focus not only on technical skills but also on digital pedagogies to enable meaningful m-learning integration.

6.2 Student engagement and classroom distractions

One of the primary concerns identified in both the survey and focus group discussions was student distraction, with 60% of teachers citing off-task behavior as a challenge. This is consistent with findings from [31], who note that unregulated smartphone use can lead to decreased student engagement. Teachers in focus groups expressed frustration over students using mobile devices for non-educational purposes, highlighting the need for structured guidelines on classroom use. Research suggests that schools that implement mobile-friendly lesson plans and engage students with interactive digital tools tend to see higher engagement and reduced misuse of devices [27]. Additionally, structured policies on mobile learning, combined with teacher-led digital strategies, can minimize distractions [31].

6.3 Infrastructure challenges and institutional support

Infrastructure challenges were another significant barrier, with 50% of teachers reporting unreliable Internet and limited technical support. Focus group discussions further emphasized that schools often lack the necessary resources

to sustain m-learning initiatives. These findings align with research showing that weak digital infrastructure hinders technology adoption [1], [19]. A study by [24] found that successful mobile learning environments require consistent Wi-Fi, access to digital resources, and institutional support for troubleshooting technology-related issues. Similarly, teachers in focus groups stressed that reliable Internet access and on-site technical assistance would significantly improve their confidence in using m-learning tools. Schools that invest in stable networks and dedicated technical support report higher adoption rates and improved teacher confidence [10].

6.4 Policy and institutional guidelines

Despite Botswana's national ICT policies, the study revealed a lack of clear guidelines on the use of mobile technology within schools, which has significantly hindered its adoption. This concern was echoed in focus group discussions, where teachers highlighted inconsistencies in m-learning policies across different institutions. The absence of standardized regulations has resulted in fragmented implementation, limiting the potential benefits of mobile learning. International best practices indicate that comprehensive national frameworks play a critical role in facilitating the successful integration of m-learning by ensuring equitable access to digital tools, particularly in under-resourced schools. Research suggests that mobile learning is most effective when institutional policies provide structured guidance on classroom implementation, thereby fostering a coherent and sustainable approach to technology-enhanced learning [18]. Such policies should delineate clear guidelines on device usage, student data privacy, cybersecurity measures, and pedagogical integration to prevent uncoordinated and inconsistent adoption.

To bridge these gaps, it is imperative that schools establish m-learning policies that balance pedagogical innovation with responsible use, ensuring that educators receive adequate technical support and access to digital resources to facilitate seamless integration [17]. Moreover, structured collaboration with educational technology (ed-tech) providers can address existing infrastructural challenges by enabling cost-effective solutions such as subsidized mobile data for academic use and tailored digital platforms aligned with Botswana's curriculum. Furthermore, 90% of teachers expressed a strong interest in professional development programs, reflecting a broader global trend in which educators increasingly seek practical training in digital learning strategies [29]. However, research underscores that for such training to be effective, it must extend beyond theoretical instruction to incorporate experiential learning approaches, wherein teachers engage with mobile tools in authentic classroom settings [22]. International models, such as those implemented in South Korea and Finland, have successfully embedded experiential learning into their teacher training programs, allowing educators to acquire hands-on experience before large-scale implementation. Additionally, subject-specific training plays a pivotal role in aligning mobile learning strategies with disciplinary requirements, thereby enhancing student engagement and learning outcomes [24], [41]. By incorporating these evidence-based strategies into Botswana's national education framework, policymakers can address the current policy deficiencies and establish a structured, scalable, and inclusive mobile learning ecosystem that supports both educators and students.

6.5 Conclusion

The discussion highlights teacher confidence, infrastructure limitations, and policy gaps as critical barriers to mobile learning in Botswana's secondary schools. Recent studies suggest that investing in teacher training, upgrading digital infrastructure, and implementing structured mobile learning policies are key to overcoming these [6]. By addressing these areas, schools can equip educators with the skills and resources necessary to integrate mobile technology effectively, ultimately enhancing learning outcomes in the digital era.

7 RECOMMENDATIONS

Based on the findings of this study, several recommendations can be made to enhance the integration of mobile technology in educational settings and address the identified barriers.

1. **Targeted Professional Development Programs:** Given the significant gap in teacher confidence and competence regarding mobile technology use, it is essential to develop and implement comprehensive professional development programs. These programs should be tailored to the specific needs of teachers, with a focus on practical, hands-on workshops that demonstrate how mobile devices and educational apps can be integrated into their teaching practices. Furthermore, professional development should be continuous, offering teachers the opportunity to update their skills as technology evolves. Collaboration with technology experts and instructional designers could also help ensure that the training provided is both relevant and effective.
2. **Subject-Specific Training:** To increase the effectiveness of mobile technology integration, training programs should be subject-specific. Teachers should be equipped with strategies that directly align with their teaching disciplines, ensuring that mobile technology is used in ways that support and enhance the curriculum. Subject-specific workshops would allow teachers to explore the most effective apps, tools, and platforms for their content area, fostering a deeper understanding of how technology can be applied in their classrooms.
3. **Infrastructure Improvement:** The study highlights the inadequacy of resources, including unreliable Internet access and a lack of technical support, as a major barrier to mobile technology integration. It is essential for schools to invest in the necessary infrastructure, ensuring that both students and teachers have access to reliable Internet connections and technical support. Additionally, schools should explore partnerships with local governments or private sector organizations to secure funding for these infrastructural improvements. A strong technological foundation is critical to ensuring the successful use of mobile devices for educational purposes.
4. **Classroom Management Strategies for Mobile Devices:** Teachers expressed concerns about distractions caused by students using mobile devices for non-educational purposes. To address this challenge, it is crucial to develop effective classroom management strategies that balance the benefits of mobile learning with the need to minimize disruptions. Schools could provide training on how to establish clear guidelines for smartphone use, implement mobile learning protocols, and foster a focused learning environment. Moreover, teachers could be encouraged to integrate m-learning in ways that keep students actively engaged,

using educational apps and tools that align with lesson objectives and encourage collaboration.

5. **Promoting Peer Collaboration and Support:** Teachers can benefit from collaborative learning environments where they can share experiences and best practices for mobile technology integration. Schools could establish peer networks or professional learning communities (PLCs) where teachers can collaborate on how to best use mobile devices in the classroom. This collaborative approach would enable teachers to learn from one another, share challenges, and offer solutions, ultimately fostering a culture of innovation and continuous improvement in technology adoption.
6. **Policy Development and Support:** Finally, educational policymakers should prioritize the integration of mobile technology into teaching and learning by creating supportive policies that address both the infrastructural and pedagogical needs of teachers. Policymakers should consider funding initiatives aimed at enhancing technology access, providing professional development opportunities, and developing clear guidelines for mobile learning. Additionally, policies that support the equitable distribution of resources, especially in underfunded schools, are essential for ensuring that all students have access to the benefits of m-learning.

In conclusion, addressing the barriers to mobile technology integration in education requires a holistic approach that includes investing in teacher training, improving school infrastructure, and developing classroom management strategies. By implementing these recommendations, schools can create an environment where mobile technology can thrive, enhancing the quality of teaching and learning and preparing students for the digital future.

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