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Teachers' Perceptions of Mobile Learning Efficacy in Ghanaian Senior High Schools

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ABSTRACT

The integration of mobile learning (M-learning) into Ghana's senior high schools reflects a global shift towards technology-enhanced pedagogy; however, its adoption remains debated amid infrastructural constraints and policy contradictions. This qualitative study explores teachers' perceptions of the effectiveness of mobile learning (m-learning) in Ghana's Akatsi South Municipality. Despite potential benefits such as promoting self-motivated learning and improving academic performance, challenges like inconsistent policy implementation and insufficient training hinder its success. The study used the six-step model developed by Braun & Clarke (2006). Thematic analysis of interviews with 10 senior high school teachers and municipal education officers shows that while m-learning encourages self-motivated learning, creative thinking, and better academic results through various digital resources, its full potential is limited by inconsistent policy enforcement, inadequate teacher training, and poor infrastructure. Participants highlight the need for structured regulatory frameworks to manage device access and usage, along with investments in ICT capacity-building and customised teacher training programmes. The findings stress the importance of aligning Ghana's Education Strategic Document (2018–2030) with practical realities, advocating for policies that are sensitive to context and that reconcile national ICT goals with the socioeconomic and pedagogical challenges faced in resource-constrained environments.

Keywords: *mobile learning; technology; mobile phone; smartphone*

INTRODUCTION

The evolution of educational methodologies in the contemporary era has been characterised by a paradigm shift towards technology-enhanced pedagogical approaches, particularly through mobile learning (M-learning). The integration of mobile learning (M-learning) into educational systems signifies a pivotal transformation in pedagogical strategies, propelled by advancements in portable technologies and wireless connectivity. Defined as the utilisation of mobile devices, such as smartphones, tablets, and laptops, to facilitate learning across temporal and spatial boundaries (Choice & Akudo, 2019), mobile learning (M-learning) has emerged as a transformative force in global education. Its potential resides in enabling interactive, personalised, and collaborative learning experiences, supported by ubiquitous Internet access and evolving digital infrastructure (Alnabhan et al., 2018; Ossiannilsson, 2018).

However, within Sub-Saharan Africa, the adoption of mobile learning (M-learning) remains heterogeneous, shaped by divergent institutional policies and stakeholder perceptions. While some nations have embraced mobile technologies as educational tools, others exhibit reluctance, often

due to concerns regarding distraction, equity, or infrastructural limitations (Kolog et al., 2018). In Ghana, this dichotomy is particularly evident. Although national frameworks such as the Education Strategic Document (2018–2030) prioritise the integration of Information and Communication Technology (ICT) in schools, implementation is hindered by systemic contradictions. Despite the increasing ownership of mobile devices among students, many senior high schools, including those located in the Akatsi South Municipality, enforce stringent prohibitions on their utilisation within academic settings (Kolog et al., 2018). Research indicates that, although students express enthusiasm for the potential of M-learning to transcend traditional classroom boundaries, institutional restrictions frequently prohibit the use of mobile devices within schools (Kolog et al., 2018). Such contradictions emphasise the critical role of teachers' perspectives in determining the viability of M-learning integration, as teacher acceptance directly influences pedagogical adoption and the efficacy of implementation (Bariham, 2022; Owusu-Boakye et al., 2022).

Research conducted in Ghana identified both opportunities and challenges. For example, studies examining educators' perceptions of platforms such as WhatsApp Messenger indicate that perceived cost, utility, and ease of use significantly influenced their willingness to adopt these tools (Owusu-Boakye et al., 2022). Similarly, although Physics Education Technology (PhET) simulations have demonstrably improved student outcomes in the domain of science education, obstacles such as insufficient ICT infrastructure, intermittent electricity access, and inadequate teacher training persist (Agyei & Agyei, 2021; Bariham, 2022). These findings are consistent with broader observations that institutional readiness, which encompasses technological resources, policy frameworks, and teacher preparedness, is essential for the successful integration of mobile learning (Grimus & Ebner, 2015; Koomson, 2019).

Despite growing scholarly attention, gaps remain in understanding localised teacher perceptions, particularly within under-resourced regions. The Akatsi South Municipality, a context characterised by varying access to educational technologies and infrastructure, presents a critical case for examining these dynamics. Previous studies have predominantly focused on urban centres, leaving rural and semi-urban settings underrepresented. Moreover, while existing research emphasises student readiness and institutional barriers, the efficacy of m-learning as perceived by teachers, key arbiters of classroom implementation, warrants deeper exploration.

The issues are compounded by enduring infrastructural and pedagogical obstacles. Educational institutions in semi-urban and rural areas, such as Akatsi South, face challenges including inconsistent electricity supply, insufficient ICT resources, and limited teacher preparedness for technology-mediated instruction (Bariham, 2022; Grimus, 2017). While studies have investigated the impact of mobile learning on student performance and motivation (Koomson, 2019; Owusu-Boakye et al., 2022), the perspectives of teachers, who play a central role in implementing curricula, remain inadequately examined. Teachers' perceptions regarding the efficacy, feasibility, and challenges of mobile learning are crucial for reconciling the divide between policy aspirations and classroom realities. However, existing research tends to focus disproportionately on urban contexts and student-centric outcomes.

This study, consequently, endeavours to address the following issue: despite the acknowledged potential of mobile learning to revolutionise education in Ghana, there exists a dearth of empirical insight concerning how senior high school educators perceive its efficacy, challenges, and applicability within a context characterised by infrastructural constraints, policy contradictions, and evolving student behaviours. By examining educators' perspectives in the Akatsi South Municipality, this research aims to elucidate the sociotechnical dynamics that influence the adoption of mobile learning, thereby informing policies and practices that align institutional mandates with the pedagogical realities of resource-limited environments. The findings aim to inform context-responsive strategies for reconciling national ICT objectives with local realities, thereby promoting

the equitable integration of mobile technologies in settings characterised by infrastructural deficits and policy ambiguities.

Research Questions

1. How do teachers perceive the effectiveness of mobile learning in senior high schools in the Akatsi South Municipality?
2. What are the perceived benefits of implementing mobile learning in the Akatsi South Municipality?

LITERATURE REVIEW

Theoretical Framework

Kuh's Seamless Learning Framework

Kuh's Seamless Learning Framework was adopted to inform this study. The Seamless Learning Framework (SLF), developed by George Kuh, emphasises the continuous integration of learning across various contexts and environments, supported by mobile technologies. According to Kuh, seamless learning enables students to connect formal and informal learning experiences in ways that promote consistent knowledge construction and application. The framework posits that learning should not be confined to the traditional classroom but should extend to diverse settings facilitated by mobile devices, thus encouraging learning that is flexible, personalised, and socially connected. Seamless learning comprises three core components: context, content, and community, which interact to shape the learning experience (Kuh, 1996).

Kuh's Seamless Learning Framework informed the current study by providing a structure for examining how mobile learning is perceived and implemented in Senior High Schools within Akatsi South Municipality. The context refers to the physical and digital infrastructure available for mobile learning, including devices, Internet access, and the overall school environment. The content addresses the nature of educational materials accessed through mobile platforms and their alignment with curriculum standards and learning outcomes. Lastly, the community encompasses the social interactions that mobile learning facilitates among students, teachers, and parents. This framework serves as the core theory guiding the study, offering insights into how the interplay of these three components influences teachers' perceptions of the efficacy of mobile learning. Teachers' perceptions of mobile learning

The perceptions of educators regarding mobile learning (M-learning) in senior high schools exhibit significant variation across global, continental, and national contexts, underscoring both common opportunities and distinct regional challenges. On a global scale, educators acknowledge the potential of M-learning to enhance student engagement and facilitate personalised instruction; however, its effectiveness is contingent upon the availability of infrastructure and pedagogical alignment. For instance, a survey conducted with 308 Indonesian educators indicated that 78% regarded mobile devices as advantageous for obtaining real-time feedback and accessing digital resources, notwithstanding inconsistent Internet connectivity (Sari et al., 2020).

A meta-analysis of 48 international studies found that teachers in high-income countries associate mobile learning (M-learning) with increased motivation and collaboration, particularly in STEM subjects (Hwang & Fu, 2019). However, these benefits face common challenges: urban teachers reported that 65% of their colleagues struggled with managing device-related interactivity and

classroom discipline, attributing difficulties to student multitasking and the addictive nature of specific applications (Hernan et al., 2019).

In Africa, teachers' viewpoints are shaped by infrastructure disparities and particular educational needs. Sub-Saharan Africa faces challenges, with only 40% of institutions having reliable Internet access (ITU, 2022). However, case studies reveal innovative approaches. For instance, teachers in South Africa have utilised mobile apps to customise STEM education for rural students, addressing the lack of textbooks by using crowdsourced video lessons (Molotsi, 2022). In contrast, a study from Oman found that 60% of teachers perceived mobile devices as distractions in the absence of strict policies, highlighting the conflict between technology's potential and the difficulties of managing a classroom (Al-Emran & Shaalan, 2021).

Ghana's experience epitomises the promise and complexity of M-learning in resource-constrained environments. High school teachers view mobile technology as beneficial for self-paced learning and for bridging conceptual gaps in science (Garzón & Lampropoulos, 2023). However, structural barriers present significant challenges. A 2022 study of three Ghanaian colleges found that 72% of teachers identified inadequate ICT infrastructure, including device shortages and unreliable electricity, as critical issues (Nyagorme et al., 2022). These challenges are exacerbated by inconsistent policy support; the Ministry of Education has contemplated lifting mobile bans since 2020, yet implementation remains ambiguous. The COVID-19 pandemic intensified these challenges; WhatsApp and SMS emerged as vital tools for urban distance learning, while rural schools faced difficulties stemming from connectivity gaps (Buabeng-Andoh, 2022). The preparedness of Ghanaian teachers has a significant influence on their perceptions.

In the Akatsi South Municipality, only 38.5% of junior high school teachers expressed confidence in the pedagogical use of mobile tools, highlighting deficiencies in national training programmes (Lokpo, 2023). Likewise, educators in Ghana have criticised in-service training (INSET) programmes for focusing on theoretical ICT skills rather than practical application (Enu et al., 2018). These disparities suggest that systemic inadequacies often overshadow teachers' optimism about the potential of m-learning. Academics recommend prioritising digital literacy training and the development of localised content to ensure that m-learning is aligned with curricular objectives (UNESCO, 2023).

In Africa, investments in infrastructure and community partnerships are essential for ensuring equitable access (Tarus et al., 2015). In Ghana, aligning national policies with the actual conditions of schools, such as device subsidies and revising INSET curricula, can effectively bridge the gap between pedagogical aspirations and practical execution (Agyei et al., 2019). The perceptions of teachers regarding m-learning not only reflect the capabilities of technology but are also influenced by institutional support, resource availability, and socio-cultural contexts.

Benefits of Mobile Learning in Senior High Schools

Mobile technology, particularly mobile phones, has become widespread among school-aged youth, and in 2015, approximately 70% of 8- to 18-year-olds owned a mobile device (Bedesem & Harmon, 2015). This increased access has prompted researchers across various educational fields to investigate how mobile phones influence teaching and learning (Bedesem & Harmon, 2015). Earlier evidence suggests that mobile learning (M-learning) can effectively support students in a range of subjects, including education (Huang et al., 2007).

According to Mohamad et al. (20109), there is a growing belief that mobile phones can serve as valuable tools for teaching and learning in schools. Despite ongoing disputes regarding the benefits and drawbacks of utilising this technology, an increasing number of research studies and projects

are investigating the use of mobile learning through mobile phones. This suggested a rising acceptance of mobile phones for educational purposes, with some schools formally incorporating them into teaching and learning practices (Mohamad et al., 2009).

Liz Kolb, as noted by Bedesem & Harmon (2015), was one of the early educational researchers advocating for the use of technology to meet the needs of new learners in educational settings. Kolb (2009) believed that mobile phones could serve as motivational tools for learning. Kolb'svarious learning activities involving mobile phones have shown positive outcomes. Furthermore, Owusu-Boakye et al. (2022) suggested that integrating WhatsApp into teaching can significantly enhance the quality of learning, as it is considered a compelling communication and collaborative tool for teaching and learning, offering advantages over other online networking platforms.

Mobile devices are generally valuable for accessible communication and information searches, which can be harnessed to enhance classroom learning (Kolog et al., 2018). The mobility aspect of mobile learning extends teaching and learning beyond the traditional classroom, providing many opportunities (Asabere, 2013). Another advantage of using mobile devices for training delivery, as highlighted by Asabere (2013), is the increased security. According to Asabere (2013), mobile learning can occur anywhere and at any time, allowing access to learning content beyond the limitations of a specific location. It promotes interaction between instructors and learners/students, offers learning opportunities while on the move, enables self-centred learning with focus, facilitates just-in-time training or content review, and fosters collaboration through both asynchronous and synchronous communication methods. For students, maintaining a positive attitude towards technology is crucial for education and the development of general skills, as it encourages the sharing and exchange of school assignments and projects, promotes commitment, and fosters collaboration and teamwork (Grimus, 2017).

Grimus (2017) argued that mobile devices, being more affordable and user-friendly than desktop PCs, can provide access to learning materials, particularly in developing countries. Furthermore, mobile technologies offer new possibilities for teaching and learning, potentially driving changes in teaching methodologies. In addition to their communication function, mobile phones can support education across various subjects due to their portability, accessibility, and educational usefulness (Grimus, 2017).

METHODOLOGY

Research Design

The study employed the interpretive paradigm, allowing for the use of a phenomenological design. The qualitative approach for data collection and analysis provided insights into teachers' perceptions, benefits, challenges, understanding of impacts, and recommendations regarding mobile learning. Qualitative research focuses on examining phenomena in their natural environments, whether current or past, to analyse their complex dimensions (Lauterbach, 2018).

Population and Sampling Techniques

The population for this study consists of all teachers within the Akatsi South Municipality. A representative sample of teachers from senior high schools in the Akatsi South Municipality was gathered using purposive selection techniques. This sampling approach is frequently utilised in qualitative research, where the objective is to comprehend the experiences and perspectives of a specific demographic (Lauterbach, 2018).

A total of ten individuals with direct experience of the phenomenon under investigation (Lauterbach, 2018) were interviewed. The sample of ten (10) participants comprised seven (7) teachers, one (1) Municipal EMIS officer, one (1) Municipal ICT coordinator, and one (1) School Improvement

and Support Officer. The selection aims for maximum variation, taking into account factors such as teaching experience, expertise in ICT subjects, and practices regarding technology integration. Data collection and analysis were conducted until saturation was reached, defined as the point where no new themes emerged after several consecutive interviews.

Data Collection

The data were gathered through an unstructured interview guide with ten participants to gain insights into their opinions. This format enabled open-ended responses and follow-up questions, yielding rich, qualitative information. Phenomenological interviews were conducted in an unstructured manner, focusing on the essence of experiences shared by both researchers and participants to gain a deeper understanding of the phenomena (Lauterbach, 2018). The researchers listened as participants described their daily experiences with children using mobile devices at school, through informal conversations where participants spoke while the researchers listened (Lauterbach, 2018). Information sheets explained the research purpose, and participants consented to audio recording. Interviews took place in various settings, including offices, cafeterias, and laboratories. Each lasted 30-60 minutes, and all data were documented textually and analysed thematically.

Data Analysis

Information from interviews was organised and analysed thematically. Thematic analysis, standard qualitative research procedure, identifies and presents recurring themes in a dataset (Braun & Clarke, 2006; Cernasev & Axon, 2023). In this study, the authors explored how teachers perceive benefits and challenges, understand impacts, and offer recommendations regarding mobile learning. Findings were interpreted and compared to derive meaningful conclusions and meet research goals. Researchers aimed to identify key concepts reflecting teachers' experiences and integrate these into a representative model as described in the TAM model.

Thematic analysis encompasses a range of steps and approaches. The study employed the six-step model proposed by Braun & Clarke (2006), which involves familiarising with data, coding, generating themes, reviewing themes, defining themes, and composing a report. This model emphasises the iterative nature of thematic analysis, allowing for the exploration of diverse viewpoints and the discovery of new insights (Nowell et al., 2017). In this study, the initial phase involved understanding interview transcripts, coding data, and clustering codes to establish themes aligned with the research objectives. Researchers compiled relevant data for each theme, analysed it against the dataset, and refined theme definitions. This process yielded a comprehensive presentation of themes, supported by relevant literature and insightful interpretations of their significance. Validation was ensured through consultations with peers, mentors, and supervisors.

Thematic analysis has merits in qualitative research, enabling the exploration of complex phenomena, the identification of patterns, and the gaining of insights into participants' experiences and perspectives (Vaismoradi et al., 2013; Hazell et al., 2021). A structured approach ensures transparency and reproducibility (Nowell et al., 2017). However, in practice it also presented challenges. Coding and theme generation were time-consuming and required careful attention (Vaismoradi et al., 2013). Theme interpretation involved subjectivity, as the researchers decided which codes to include and how to organise them (Vaismoradi et al., 2013). There was a risk of oversimplification, as themes may not have captured the data's full complexity (Vaismoradi et al., 2013). To address these challenges, the researchers maintained transparency in the analysis process, provided clear rationales for coding choices, and engaged in reflexivity to acknowledge personal biases (Nowell et al., 2017).

Ethical Considerations

Ethical clearance was sought from the Valley View University Institutional Review Board. Participants were provided with a comprehensive explanation of the study's objectives and

methods, ensuring their voluntary participation. All participants provided their written informed consent. Participants' identities and personal information were kept confidential. Pseudonyms or unique identifiers, such as their profession and title, were used instead of real names in the research findings and report. The interviewees' names were excluded from the analysis for confidentiality reasons. The interviews were held privately to guarantee the participants' privacy. The study presents descriptive statistics and five themes, including teachers' perceptions of its effectiveness, implementation, benefits, challenges, impact on student engagement, motivation, and academic performance. It also provides recommendations for optimising nomadic education implementation.

Descriptive Data of the Interview Participants

Table 1: *Descriptive data of the interview participants*

Profession	Place of Work	Code
Teacher	Abor Senior High School	P1
Teacher	Abor Senior High School	P2
Teacher	Akatsi Senior High Technical School	P3
Teacher	Akatsi Senior High Technical School	P4
Teacher	Avenor Senior High School	P5
Teacher	Avenor Senior High School	P6
Teacher	Avenor Senior High School	P7
Municipal EMIS officer	Municipal Education Office	P8
Municipal ICT coordinator	Municipal Education Office	P9
School Improvement and Support Officer	Municipal Education Office	P10

Source: Field Data (2023)

Table 1 presents data for the ten interviewees in the Akatsi South Municipality. This aligns with Young & Casey (2018), that a standard sample size is 5 to 25 people who have experienced the phenomenon being examined. Most participants, accounting for 70%, identify as teachers. This significant representation suggests that their insights were vital in understanding the perceptions of senior high school students regarding mobile learning. Teachers, engaged in the educational process, have firsthand knowledge of student interactions with mobile learning platforms, the challenges they encounter, and the benefits they gain. Additionally, the dataset includes participants with specific administrative roles. One respondent holds the title of Municipal EMIS Officer, making up 10% of the sample. This function may focus on education data collecting and administration from a systems viewpoint. Another respondent is designated as the Municipal ICT Coordinator, constituting 10% of the sample. This role is significant in mobile learning, as it involves coordinating and overseeing the technological aspects of education. Similarly, a School Improvement and Support Officer, accounting for 10% of the participants, adds a dimension of educational development and support to the study.

The table presents the workplaces of participants in the Akatsi South Municipality. Abor Senior High School had two participants, 20% of the total sample, whose contributions highlighted the unique challenges and benefits for students, teachers, and administrators. Akatsi Senior High Technical School had the most significant participation, with three participants, accounting for 30%

of the sample, emphasising the school's significance in the study. Their insights provided a comprehensive view of mobile learning in technical education, revealing its effectiveness and implications for students. Avenor Senior High School contributed two participants (20%), whose perspectives revealed the nuances of the impact of mobile learning, including student engagement, pedagogical strategies, and the challenges faced by teachers. The Municipal Education Office had three participants (30%), offering an administrative perspective on mobile learning implementation, which highlighted coordination, support, and challenges in deploying strategies across schools. This distribution enhances the study's exploration of the perceived impact of mobile learning. Insights from teachers, particularly in technical education, and administrative viewpoints contributed to understanding how senior high school students in Akatsi South Municipality experience mobile learning.

RESULTS

Objective 1: Teachers' Perceptions Regarding the Effectiveness of Mobile Learning

Participants were asked how effective is mobile learning in senior high schools. During the interview discussion, most of the ICT teachers indicated that they cannot say it is effective since students are not permitted to use or bring devices to school. The students' mobile phones are usually confiscated when they are found out. This result highlights the need for a controlled framework for mobile learning to be effective. While acknowledging the current restrictions on students' use of mobile devices in Senior high schools in Ghana, they express optimism about the future potential.

The Education Strategic Document (2018-2030) targets the implementation of numerous instructional reforms, including the integration of Information and Communication Technology (ICT) into teaching and learning. Nevertheless, quantitative data and anecdotal evidence suggest that the acceptance and incorporation of virtual learning among senior high school teachers in Ghana are still in the early stages of development (Bariham, 2022). This result suggests that mobile learning is not yet practical, as it has not been integrated into the educational curriculum, but it will be effective if implemented. In other words, mobile learning, although not yet implemented, is compelling. They suggest that proper implementation and control could lead to positive outcomes. This viewpoint underscores the importance of structure and regulation in optimising the benefits of mobile learning.

Another teacher argues;

> *"Hmm, I sought permission to use the devices in the regular classroom but was denied, even though I made it clear that I would keep all the devices before and after my lessons. I was told it was not allowed, so I resorted to using it outside the classroom. However, then, it will be effective when controlled. If implemented without control, it will not be effective"* [P2].

This perspective echoes the sentiment that the effectiveness of mobile learning is closely tied to its implementation. The interviewee shares a personal experience of seeking permission to use mobile devices in the classroom but being denied. This result confirms the assertion of Kolog et al. (2018) that students are prohibited from using mobile devices while in school, despite participants believing that mobile devices are helpful for teaching and learning, especially in mobile learning contexts. The interview response also emphasises that the effectiveness might be compromised without control. This highlights the balance between harnessing the technology's potential and maintaining a conducive learning environment.

An Education Officer from the Municipal Office posits,

> *"It is effective. However, it would be more effective in the future when it is implemented and well structured"* [P10].

This participant views mobile learning as already effective, with the potential for even greater effectiveness in the future. This perspective sees the current impact as a positive sign and envisions enhanced outcomes as implementation becomes more widespread. The viewpoint aligns with the idea that continuous improvement can produce more positive results.

Another participant also confirmed that

> "… *yes, it is effective. Students engaged in this form of learning usually outperform their peers because they have access to a varied source of information*" [P9].

This participant confidently asserts that mobile learning is effective, leading to better academic performance for students who engage with this approach. Access to diverse information sources is crucial for students' improved academic performance. This perspective emphasises the potential of mobile learning to enhance learning outcomes.

Another participant added;

> *"It is not yet, because, per policy, it has not been implemented, so I would say it is ineffective. However, despite my optimism, I would only say so if the policies are in place. Our country often implements things hastily without proper grounds for preparation. So, it would depend on the guidelines for implementation. According to my visitation, 80 to 85% of them are using phones"* [P8].

P8 here offered a cautious perspective, emphasising that effectiveness will depend on the adequate implementation of policies and guidelines. Their mention of challenges and opposition points to the importance of a well-structured approach that addresses potential obstacles. This perspective emphasises the need for a systematic implementation process.

Grimus & Ebner (2015) proposed a strategy that can be adopted in Ghana when implementing mobile learning in Senior High Schools (SHSs). Grimus & Ebner (2015) recommended that policymakers create a sense of ownership among the teachers involved, making them ambassadors who could promote mobile learning to their colleagues. Workshops should be organised as part of the strategy, covering various topics such as basic ICT skills, content development for eReaders and mobile phones, user-generated content, and the sustainable implementation of mobile learning.

Another ICT teacher emphasises that;

> *"… it would be if implemented. Although there may be challenges and opposition, the policy framework is well-defined and well-structured, with the necessary logistics in place. This technology has come to stay. People would initially oppose, but they would conform once they are educated"* [P6].

This teacher's perspective acknowledges the likelihood of challenges and opposition to mobile learning. However, the teacher believes education and a well-defined policy framework can help overcome resistance. The sentiment is that, with proper education and understanding, individuals who initially oppose the idea may eventually come to embrace it.

Another teacher speculates;

> *"I am not certain, but I believe it would be. Nevertheless, I would say yes to the learners who are educated on the proper use of smartphones. I deployed smartphones to teach my first batch, and we used them for practice, such as coding in HTML, where we utilised mobile phone apps. However, its effectiveness depends on the teacher*" [P3].

This interviewee emphasises that the effectiveness of mobile learning depends on various factors. They highlight the importance of student education on appropriate smartphone use, teacher

initiatives, and effective communication methods. This perspective highlights the multifaceted nature of mobile learning's effectiveness.

Another teacher postulates,

> "…*mobile learning among Senior High School students can be effective when implemented properly. However, its effectiveness depends on content quality, student engagement, and teacher guidance*".

This teacher's viewpoint expresses optimism about the potential effectiveness of mobile learning, contingent on proper implementation. The interviewee emphasises the flexibility and accessibility that mobile devices offer for learning. They acknowledge that effectiveness is influenced by content quality, student engagement, and teacher guidance.

The interview results provide insights into the effectiveness of mobile learning in senior high schools. The results suggest that mobile learning is impractical in senior high schools because current policies prohibit the use of phones on school premises. However, approximately 85% of students are secretly using them. While optimism exists, the viewpoints underscore the importance of clear policies, controlled implementation, quality content, and practical guidance. The success of mobile learning depends on striking a balance between technological benefits and challenges. According to Asabere (2013), proper planning, including developing training programmes and selecting suitable schools, is crucial for the successful implementation of mobile learning. Workshops can enhance teachers' skills in mobile learning strategies. Additionally, a robust network infrastructure and a mobile learning management system are essential for facilitating these initiatives.

Objective 2: The Perceived Benefits of Implementing Mobile Learning

There is a speculative debate regarding the positive effects of mobile learning on student engagement, motivation, and academic performance. Empirical evidence suggests that mobile learning (M-learning) can effectively support students across different subjects, including education (Huang et al., 2007). According to Mohamad et al. (2009), there is a growing belief that mobile phones can be valuable tools for teaching and learning in schools. Mobile devices are generally helpful for accessible communication and information search, which can be harnessed to enhance classroom learning (Kolog et al., 2018).

Based on this debate, interviewees were prompted to offer their perceptions. The first ICT teacher on this theme responded;

> *"I cannot say it is beneficial on a whole scale now, but if it is implemented, it would be. Most private and international schools in this country use them, despite concerns about their adverse effects. However, those students perform well"* [P1].

This teacher is unsure whether mobile learning has been fully implemented. This viewpoint underscores the potential benefits of mobile learning, particularly in private and international schools. The studies by Huang et al. (2007), Mohamad et al. (2009), and Kolog et al. (2018) evidenced that mobile learning was beneficial outside Ghana. The teacher participant acknowledges students' performance in such schools, suggesting that using mobile devices could contribute positively to their academic achievements. The implication is that, despite concerns, implementing mobile learning might improve performance.

A business management teacher noted that;

> *"The benefits were tremendous when I compared the results of those who used a mobile phone for the projects with those who did not. The variations were positively skewed toward the use of smartphones. Yes, it is beneficial. The benefits of mobile learning are*

> *tremendous: learning on the go, at leisure, access to varied opinions, and challenging the same subject matter, among other advantages"* [P5].

This teacher highlights the benefits observed from students who utilised mobile phones for projects. The results are seen as generating diverse ideas and resourceful responses. The connection between mobile learning and enhanced engagement becomes evident through these positive outcomes.

An Education Officer also presented another piece of evidence:

> *"Yes, I did, and it worked. I engage my learners to use emails at home to do and submit assignments. I part-time teach at another school with a waiver to utilise this opportunity. We have past questions online: who are they there for? The teacher or the student? If it benefits the students, how would they access them without the tools?"* [P10].

The perceived benefits revolve around the flexibility of learning on the go and access to diverse opinions on the same subject matter. This perspective aligns with the idea that mobile learning enables students to engage with various views, fostering a deeper understanding of topics. These results align with those of Huang et al. (2007), Mohamad et al. (2009), and Kolog et al. (2018), which suggest that mobile learning is beneficial to students.

Another Education Officer responded,

> "*Yes, of course, it is helping. However, it would help realise academic achievements to the fullest if implemented well because it is effective elsewhere"* [P9].

This viewpoint suggests that while mobile learning is currently beneficial, its potential for enhancing academic achievement can be fully realised with practical implementation. The perspective draws on the positive outcomes elsewhere to anticipate similar local successes. One of the participants speculates that

> "…*yes, it would be since about 80% of them are using smartphones and the rest who are yearning to*" [P8].

The focus here is on the high smartphone usage among students. The belief is that this increased usage and students' eagerness to adopt smartphones signify the potential for beneficial outcomes from mobile learning.

Another ICT teacher explains the evidence for using social media and interactive learning:

> *"Yes, for some students I know. When implemented well, it would depend on the framework surrounding it. They can also use social media networks to learn. Watch educational Video tutorials. Although the adverse effects exist, they should be directed and guided. For instance, Telegram channels, Twitter and Facebook Tech update groups that give updates on new technologies can boost their interest. I used past questions as well. I asked my students to bring their smartphones to school but to submit them to me. I then uploaded past questions on them for their use, and we discussed them virtually, which benefited them"* [P3].

The teacher emphasises the positive impact of mobile learning when it is well implemented. They emphasise the use of social media networks for learning and the interactive nature of educational video tutorials. The example of using past questions on smartphones and virtual discussions highlights practical strategies for effective learning.

Another ICT teacher claims that mobile learning is designed to address learning needs. The teacher posits that;

> "…*yes, it is to those learners who use them for educational purposes. You see, mobile learning benefits the tertiary student who is not even guided, right? It can and will benefit the academic performance of Senior High School students if it is designed to address their learning needs and preferences and is well-structured and guided"* [P2].

The teacher emphasises the importance of a well-designed and structured approach to mobile learning. The focus is on tailoring mobile learning to address the specific needs and preferences of senior high school students, indicating that effectiveness hinges on careful planning. Grimus (2017) argued that mobile devices, being cheaper and more user-friendly than desktop PCs, can provide access to learning materials, particularly in developing countries.

Another ICT teacher claims that mobile learning ensures interactive, personalised learning. According to this respondent,

> *"Mobile learning can benefit the academic performance of Senior High School students. It can make learning more interactive and engaging, allow personalised learning paths, and enable quick access to resources and information. However, its impact may vary based on students' usage patterns and the integration of effective pedagogical strategies"* [P7].

This viewpoint discusses the potential benefits of mobile learning in terms of interactivity, engagement, and personalised learning paths. The perspective acknowledges that its impact may vary based on how students use it and how effectively pedagogical strategies are integrated.

These results reveal a broad consensus among all the participants about the potential benefits of mobile learning in senior high school classrooms. Their perspectives highlight improved engagement, diverse access to resources, personalised learning, and the potential for enhanced academic performance. These results align with those of Huang et al. (2007), Mohamad et al. (2009), and Kolog et al. (2018), among others, which suggested that mobile learning is beneficial to students. However, these benefits often depend on well-structured implementation, careful guidance, and alignment with students' learning needs and preferences.

The Main Conclusions of the Study on Mobile Learning in Ghanaian Senior High Schools

The debate on mobile learning in Ghanaian senior high schools reveals a consensus among teachers and policymakers: mobile devices can enhance educational potential, but their success relies on structured implementation and effective regulations. Currently, mobile learning remains theoretical mainly due to the prohibition of mobile phone usage in schools, which restricts access to digital resources despite their recognised educational value (Kolog et al., 2018). Teachers observed that students frequently outperform their peers when provided with regulated access to mobile devices, which offer diverse information and enhance engagement (Bariham, 2022). However, in the absence of clear policies and controlled environments, distractions and misuse, such as social media addiction, can undermine academic success. This underscores the necessity for a balanced approach to integrating mobile technology into curricula while mitigating its drawbacks.

A recurring theme is the critical role of policy and infrastructure in enabling mobile learning. Ghana's *Education Strategic Plan (2018–2030)* and *ICT in Education Reform* outline ambitious goals for digital integration, yet implementation lags due to logistical challenges and resistance (Bariham, 2022). For instance, teachers described bureaucratic hurdles when seeking permission to use mobile devices in classrooms, even for structured lessons. The Municipal EMIS officer highlighted that hasty, unprepared rollouts could exacerbate inequities, as 80–85% of students already use smartphones informally, often without guidance (Bariham, 2022). Successful adoption thus depends on transparent guidelines, reliable Internet access, and equitable device distribution -

elements absent in current frameworks. Without these, mobile learning risks becoming a privilege for well-resourced schools rather than a universal tool.

The training of educators and the engagement of stakeholders are identified as crucial factors for success. The strategy proposed by Grimus &Ebner (2015), as mentioned in the study, advocates for empowering educators to serve as “ambassadors” of mobile learning through workshops focused on information and communication technology (ICT) skills and content development. Educators corroborated this perspective, highlighting that resistance frequently arises from a lack of familiarity with the pedagogical applications of technology. An ICT educator shared an example illustrating how students excelled when directed to utilise coding applications on smartphones, thereby demonstrating the potential of teacher-led innovation (Bariham, 2022). However, such initiatives tend to remain isolated in the absence of systemic support. Professional development programmes, in conjunction with incentives for educators to experiment with mobile tools, could effectively bridge the gap between policy and practice, thereby fostering a culture of adaptability and collaboration.

The study further elucidates the capacity of mobile learning to personalise education and enhance accessibility. Participants observed that mobile devices facilitate students' ability to learn at their own pace, access updated materials, and engage with interactive content, thereby aligning with global trends in Education 4.0 (Huang et al., 2007). For instance, educators reported utilising WhatsApp and email to assign homework, thus enabling continuity beyond the classroom setting. These practices resonate with findings from tertiary institutions in Ghana, where mobile learning has significantly improved access to coursework despite existing infrastructural barriers (Kolog et al., 2018). It is noteworthy, however, that the advantages of mobile learning are not inherently guaranteed; they necessitate deliberate design. Customising content to address students’ specific needs, monitoring usage, and integrating mobile platforms with established curricula constitute essential measures to ensure pedagogical coherence rather than fragmentation.

Finally, the study advocates for a hybrid model that balances technology with traditional methods. While mobile learning offers flexibility, teachers cautioned against overreliance, stressing the irreplaceable value of face-to-face interaction for mentorship and collaborative learning (Asabere, 2013). The Municipal ICT Coordinator observed that students using mobile devices often excel academically but warned that unregulated access could erode social skills (Bariham, 2022). Thus, the ideal framework combines mobile tools with structured classroom activities, ensuring technology complements rather than replaces human-centred education. As Ghana navigates this transition, the lessons from early adopters, both successes and setbacks, provide a roadmap for harmonising innovation with academic integrity, ultimately fostering a “learning nation” as envisioned in its strategic plans (Bariham, 2022).

The study concludes that mobile learning in Ghanaian senior high schools is not a question of *whether it will happen, but rather how it will happen*. With deliberate policies, teacher empowerment, and equitable infrastructure, mobile technology could revolutionise education, transforming challenges into opportunities for a digitally inclusive future.

Implications of the Study

The findings of this study hold significant implications for educational policymakers, school administrators, and curriculum developers in Ghana. They underscore the need to revise restrictive mobile device policies in senior high schools. While the Ghana Education Service’s ban aims to minimise distractions, it inadvertently stifles opportunities for innovation and digital literacy. Policymakers should establish a regulatory framework that strikes a balance between control and

flexibility, enabling the integration of mobile learning under appropriate guidance. This framework must align with Ghana's Education Strategic Plan (2018–2030), fostering ICT integration while addressing issues of equitable access to devices and reliable Internet. Without these reforms, educational inequities are likely to persist, leaving students in under-resourced schools without access to the mobile learning advantages that their peers in private institutions enjoy (Bariham, 2022; Kolog et al., 2018).

The study highlights the crucial importance of teacher preparedness and institutional support in fully realising the potential of mobile learning. To achieve success, professional development must enable teachers to create mobile-friendly content, monitor student engagement, and mitigate risks such as device misuse. Workshops based on the recommendations of Grimus & Ebner (2015), which emphasise ICT literacy and pedagogy, can help cultivate teacher confidence and innovation. Schools should consider adopting hybrid models that integrate mobile technology with traditional methods, ensuring that face-to-face mentorship and collaboration remain central to the learning experience (Asabere, 2013). By addressing these challenges, Ghana can transform mobile learning from a fragmented initiative into a scalable and inclusive system that enhances academic performance and prepares students for a future driven by technology.

Limitations of the Study

The findings of this study are limited by a small and homogeneous sample of 10 participants (7 teachers and three staff members from the Municipal Education Office), which restricts the generalizability of the results to broader educational contexts in Ghana or similar settings. The reliance on solely qualitative, self-reported data introduces the risk of social desirability bias, as participants may have placed greater emphasis on conforming to national ICT policies rather than expressing practical challenges. Furthermore, the exclusion of student perspectives and quantitative metrics limits insights into learner experiences and the empirical impact of mobile learning. Additionally, the lack of longitudinal data or geographic diversity, given that participants were chosen from specific municipal offices, hampers our understanding of how the adoption of mobile learning evolves or varies across different regions. This underscores the need for future mixed-methods research to address the identified gaps.

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