

## Evaluation of Mobile Learning Technology Usage in Education During the Pandemic

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**Abstract**— *This study aims to evaluate the use of mobile learning (m-learning) technology in the educational process at SDN Benua Anyar 1 Banjarmasin, focusing on student engagement, satisfaction, and the challenges faced by educators. Using a qualitative approach, the study involves 20 students and 15 educators as subjects. Data were collected through in-depth interviews and observations of the learning process, and analyzed using thematic analysis to identify patterns and key issues. The findings indicate that m-learning enhances student engagement due to its flexible access, but does not show a significant difference in academic outcomes compared to traditional face-to-face learning. Additionally, issues such as unstable internet connections, device limitations, and lack of social interaction impact motivation and learning outcomes. These findings highlight the need for improvements in technological infrastructure and an approach that integrates social elements to enhance the effectiveness of m-learning.*

**Keywords**— *Mobile Learning, Evaluation, Technology*

### 1 Introduction

The COVID-19 pandemic, which began in early 2020, has altered many aspects of life, including the way we learn. One significant impact is the substantial shift from face-to-face learning to online learning. Mobile learning (m-learning) technology refers to the use of mobile devices such as tablets and smartphones to support learning activities [1][2]. It is a key solution for continuing the educational process. With such technology, students can learn anytime and anywhere with greater ease and flexibility. However, the implementation of m-learning during the pandemic has faced many challenges, such as the digital divide, infrastructure limitations, and effective pedagogical evaluation [3][4].

There are differing opinions on the use of m-learning in education. By providing flexibility in the learning process, m-learning can enhance educational accessibility and student engagement, according to [5]. However, [6] note that factors such as technological readiness and user skills often affect the adoption of this technology. A study by [7] shows that the design of learning materials suitable for mobile formats is crucial for achieving the best success rates. Additionally, [8] indicate that some students do not have equal access to the necessary devices, even though m-learning allows for an interactive learning experience. Finally, research by [9] shows that the integration of m-learning into the curriculum requires a flexible approach to address various technical and pedagogical issues.

By specifically evaluating how m-learning was used during the pandemic, this study fills a gap in the existing literature. It focuses on aspects that have not been widely studied, such as the differences in student experiences between urban and rural areas and the long-term impact on learning outcomes. This study also examines how local contextual factors influence the effectiveness of m-learning, which can inform the best ways to build online learning methods for the future [10][11].

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This study aims to evaluate how effective the use of m-learning has been during the COVID-19 pandemic. It also seeks to identify the challenges faced by students and educators, evaluate how m-learning impacts learning outcomes, and make suggestions on how mobile technology can be better utilized in education moving forward [12][13]. This research is expected to contribute significantly to educational practices and policies by understanding how m-learning affects the learning process and identifying components that influence its success.

The study finds that student engagement and learning outcomes improved as a result of using m-learning during the COVID-19 pandemic. However, there are significant challenges that need to be addressed. By evaluating the use of m-learning in the context of the pandemic, this study is expected to find that while this technology offers benefits, its effectiveness is influenced by factors such as user readiness, device accessibility, and internet connection quality [14][15]. Additionally, the study suggests that adaptive approaches that consider local conditions and the unique needs of students can help them achieve better learning outcomes through m-learning.

## 2 Method

This study adopts a quantitative research design with a survey and case study approach to evaluate the use of mobile learning technology at SDN Benua Anyar 1 Banjarmasin during the COVID-19 pandemic. This design includes descriptive and inferential analysis to describe and understand the experiences of students and educators in the online learning process. The study population includes approximately 500 students and 50 educators at SDN Benua Anyar 1 Banjarmasin, with a purposive sample of 150 students and 15 educators who actively use m-learning. The research instruments consist of structured questionnaires to collect data on perceptions and satisfaction, in-depth interviews to gain insights, and document analysis related to m-learning policies and materials.

The study began with the preparation of tools, which included interview guidelines and tests for the validity and credibility of the questionnaires. Data were collected through document analysis related to m-learning policies and practices, the online distribution of questionnaires, face-to-face or online interviews, and descriptive and inferential statistical analysis [16]. Qualitative data from interviews were analyzed thematically to identify main themes. This analysis will be compiled into a research report aimed at providing insights into the effectiveness of m-learning, the challenges faced, and solutions for future improvements.

## 3 Findings And Discussion

### Students' Engagement and Satisfaction

The use of m-learning can significantly increase student engagement in the learning process due to the flexibility and easier access to learning materials [17]. However, accessibility issues remain a major barrier hindering the learning experience for some students. High student engagement is measured through active interaction with materials and platforms, while student satisfaction is influenced by ease of access and the technical difficulties they experience [18][19].



**Figure 1.** Student Contextual Immersion

Based on the diagram above, the use of m-learning at SDN Benua Anyar 1 Banjarmasin significantly increases student engagement due to the flexibility in time and location for learning. However, accessibility issues remain a major obstacle that hampers the learning experience for some students. Approximately 30% of students face difficulties accessing learning materials due to unstable internet connections and inadequate devices. Frequent internet disruptions make it challenging for students to consistently access materials [20]. Additionally, limitations in devices, such as smartphones or tablets that do not support m-learning features, also reduce the effectiveness of the learning process [21][22]. Furthermore, learning materials are not always available when needed, adding to the discomfort and hindering the students' learning process.

Interviews with 20 students at SDN Benua Anyar 1 Banjarmasin revealed that 70% of students felt more engaged in online learning compared to face-to-face methods. They appreciated the flexibility in time and ease of access offered by m-learning, allowing them to learn from various locations at any time. On the other hand, 30% of students reported technical issues, such as unstable internet connections and device limitations, which hindered their access to learning materials. As one student, Jagad, mentioned, "I really appreciate the flexibility of m-learning. I can learn anytime, but I often face problems with poor internet connection. Moreover, materials are often not available when I need them, which hinders my learning process."

Thus, the high level of student engagement indicates that m-learning successfully boosts student motivation and participation. However, the accessibility issues faced by 30% of students highlight the mismatch between the available technological infrastructure and the students' needs. This suggests that technological infrastructure improvements are necessary to allow all students to freely access online resources [23].

### Challenges in M-Learning Implementation by Educators

Educators face several major issues when implementing m-learning, such as difficulties in designing materials suitable for mobile formats and lack of training. These issues affect the quality of teaching, and further efforts are needed to improve the use of m-learning in the future.

**Table 1.** M-Learning Implementation Challenges

No.	Aspect
1	Difficulty in Material Design
2	Lack of Training
3	Unclear Policies

This indicates that teachers face many major problems when using m-learning. One of the main problems lies in material design. Many learning concepts are difficult to adapt to mobile formats, making it challenging to create effective materials. Additionally, the training available to educators is deemed insufficient, leaving many educators unprepared to effectively utilize m-learning technology. Unclear or inadequate policies add to the problem, making it difficult for educators to develop appropriate materials [24]. The quality of teaching is affected by these challenges, indicating that further efforts are necessary to enhance support and guidelines for educators so that m-learning can be better utilized in the future [25][26].

A survey of fifteen educators at SDN Benua Anyar 1 Banjarmasin found that sixty percent of educators experienced difficulties in creating effective mobile learning materials. Additionally, they stated that the training they received was not comprehensive enough to prepare them to use m-learning tools effectively. Furthermore, current policy documents are often considered unclear or insufficiently detailed, making it difficult for educators to develop appropriate materials. As one educator, Mujiburrahman, said, "Designing materials for m-learning is very challenging because not all content is easily adapted to mobile formats. We need more detailed guidelines. Moreover, the instructions we received were inadequate to provide a good understanding of how to properly utilize this technology." Difficulties in material design and lack of training impact educators' ability to effectively implement m-learning [27]. This underscores the need for better training and clearer guidance to support educators in developing quality m-learning materials.

### Comparison of M-Learning Effectiveness with Traditional Learning

Qualitative analysis shows that while m-learning increases student engagement, academic outcomes and motivation do not show significant differences compared to face-to-face learning [28][29]. This suggests that aspects of social interaction and direct support from educators still play a crucial role in achieving optimal learning outcomes. According to Daniel Budi, a student, "I feel more engaged when using m-learning, but direct interaction in the classroom greatly helps in understanding the material. Although I can learn at any time, I feel less motivated because there are no classmates and teachers around me."

Interview data indicate that students report higher engagement with m-learning, but their academic outcomes do not show significant differences compared to students in face-to-face learning. Some students feel less motivated due to the lack of social interaction that typically occurs in face-to-face learning.

**Table 2.** Comparison

Aspect	M-Learning	Face-to-Face Learning	Comparison
Student Engagement	High engagement due to flexible access.	Stable engagement through direct interaction.	M-Learning is higher in engagement, but its impact on academic outcomes is not significant.
Academic Outcomes	No significant improvement compared to face-to-face learning.	Academic outcomes are generally stable or better due to direct support.	No significant difference in academic outcomes between m-learning and face-to-face learning.
Motivation	Motivation tends to decline due to lack of social interaction.	High motivation due to support and social interaction.	Face-to-face learning is better at maintaining student motivation.

Aspect	M-Learning	Face-to-Face Learning	Comparison
Social Interaction	Limited in m-learning.	High and supports the learning process.	Face-to-face learning excels in social interaction.

M-Learning increases engagement but does not show a significant difference in academic outcomes. Student motivation in m-learning is lower due to the lack of social interaction, while face-to-face learning is more effective in academic outcomes and motivation thanks to direct support and social interaction [30][31]. A combined approach may be more effective.

Although m-learning offers benefits in terms of engagement, there is no significant improvement in academic outcomes compared to face-to-face learning. The lack of social interaction in m-learning may affect motivation and learning outcomes. This suggests that an approach that combines the advantages of m-learning with social interaction elements from face-to-face learning may be more effective in achieving optimal learning outcomes.

#### 4 Conclusion

This study found that while m-learning significantly increases student engagement through flexible access and learning time, there is no significant difference in academic outcomes compared to face-to-face learning. Most students reported higher engagement with m-learning, but technical issues such as unstable internet connections and device limitations limited the effectiveness of their learning experience. Additionally, student motivation tends to decline in m-learning due to the lack of social interaction that usually occurs in face-to-face learning environments. These findings emphasize the importance of considering social interaction elements in the design of technology-based learning.

The results of this study support engagement and motivation theories, which suggest that the flexibility of m-learning can increase student engagement but does not necessarily impact academic outcomes if not accompanied by social support and direct interaction. This study also highlights the importance of integrating social elements into m-learning models to achieve optimal learning outcomes, in line with theories that suggest social support plays a crucial role in the learning process. These implications suggest that further research should explore ways to combine the advantages of m-learning with the social aspects of face-to-face learning.

This study has several limitations, including a sample size limited to 20 students and 15 educators at one location, SDN Benua Anyar 1 Banjarmasin, which may not be fully representative of a broader context. Additionally, the data collected is primarily qualitative, which may not provide a complete picture of the effectiveness of m-learning in different contexts. These limitations indicate the need for further research with larger samples and diverse methodological approaches to gain a more comprehensive understanding of the impact of m-learning on the learning process.

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