The Role of m-Learning in Project-Based Learning Models in Elementary Schools

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ABSTRACT

Project-based education has become an increasingly popular approach in today's education system, especially at the primary school level. Project-based learning allows students to engage in real activities that involve exploring, collaborating, and applying the concepts they learn in real-life contexts. In the digital era that continues to grow, m-Learning (learning via mobile devices) has become an important instrument in helping educators implement project-based learning models in elementary schools. This study aims to investigate the role of m-Learning in a project-based learning model in elementary schools. This study will involve collecting qualitative and quantitative data through classroom observations, teacher interviews, and student surveys. The research focus will cover several important aspects, including (1) The use of m-Learning in providing relevant and varied learning resources to students, (2) The effectiveness of m-Learning in increasing student motivation and involvement in project-based learning models, (3) The impact of m-Learning on students' collaborative skills and creativity in developing their projects, (4) Teachers' perceptions of the use of m-Learning in project-based learning models. It is hoped that the results of this research will provide a better understanding of the role of m-Learning in the context of project-based learning in elementary schools. The findings of this study can provide insight to educators, teachers, and decision-makers in the field of education to optimize the use of technology in an effort to improve the quality of learning in elementary schools.

Keywords: information technology, m-learning, learning model, project base, SD

INTRODUCTION

Education in the digital era has experienced rapid development, with technology becoming an integral part of everyday life. Amidst these changes, the project-based learning model has emerged as an innovative and effective approach to helping students develop a deep understanding of learning concepts, as well as collaborative and creative skills (Anderson, 2021). The project-based learning model allows students to engage in real projects that demand problem-solving, critical thinking, and the practical application of their knowledge. These projects create an active learning environment, where students work in teams, interact with real resources, and face challenges similar to real-world situations (Anderson, 2017). Thus, the project-based learning model focuses on practical application and prepares students to face real-world challenges. In addition, mobile technology that continues to grow has also made a significant contribution to the educational context. m-Learning, or learning via mobile devices, has become one of the tools used by educators to facilitate interactive and flexible learning. In the context of project-based learning models in elementary schools, m-Learning can act as a means of integrating technology and expanding student access to relevant and varied learning resources (Brown, 2019).

However, despite the potential offered by m-Learning in a project-based learning model, there is still a need to conduct more in-depth and comprehensive research to explore the precise role of m-Learning in the primary school setting. There are still problems such as limited relevant learning resources, namely the project-based learning model requires access to various relevant learning resources, such as interactive learning materials, videos, educational applications, and other multimedia content (Chen, 2018). However, primary schools often face limited resources, both in terms of technology infrastructure and lack of accessibility to mobile devices. This problem can affect the effective implementation of m-Learning in project-based learning models in elementary schools. In addition, challenges in increasing student motivation and involvement such as project-based learning require active participation of students in the learning process, including collaboration, exploration, and application of concepts in real contexts. However, some students may experience challenges maintaining high motivation and engagement throughout the project. It is important to understand whether and how m-Learning can play an important role in increasing student motivation and engagement in project-based learning models in elementary schools (Doe, 2017). Another problem is the development of students' collaborative skills and creativity, namely the project-based learning model aims to develop students' collaborative skills and creativity through projects that encourage teamwork, problem-solving, and innovation. However, in the context of using m-Learning, it is necessary to examine the extent to which mobile technology can support and facilitate the development of these skills (García-Holgado, 2019). Can m-Learning be an effective tool for encouraging student collaboration and creativity in the context of project-based learning in primary schools? The next problem is teacher perceptions and readiness in adopting m-Learning, namely teacher readiness and perceptions of using m-Learning are also important factors in successful implementation. Teachers who have a good understanding of the potential and benefits of m-Learning will be more likely to integrate it effectively into project-based learning models (Garcia, 2021). Therefore, it is necessary to conduct research to explore teacher perceptions and readiness in adopting m-Learning in the context of project-based learning in elementary schools.

Solutions that have been made by previous researchers regarding the role of m-Learning in project-based learning models in elementary schools include various approaches and strategies such as the integration of relevant digital resources, namely the use of educational applications and platforms specifically designed to support project-based learning models in elementary schools. This includes mobile applications that provide access to interactive learning materials, multimedia content, and other supporting resources (Garcia, 2020). This solution aims to enrich student's learning experience through the use of technology that is relevant to the context of the project they are working on. In addition, solutions that have been found such as teacher training and mentoring are important for teachers to have a good understanding of the potential and use of m-Learning in project-based learning models (Garcia, 2021). Researchers have suggested special training and assistance for teachers in adopting and integrating m-Learning into their learning practices. This includes training on the use of mobile devices, applications, and effective learning strategies with these technologies (Heradio, 2020). The next solution is the use of collaborative platforms, namely collaboration between students is an important element in the project-based learning model. Therefore, the solution that has been proposed is the use of a collaborative platform that allows students to work in teams, share ideas, and interact with each other in their projects (Johnson, 2018). These platforms can include features such as discussion forums, co-working spaces, or collaborative apps that allow students to work virtually on their projects. Another solution is Technology-based evaluation and feedback, namely the use of technology-based evaluation and feedback tools to monitor student progress and provide timely feedback (Johnson, 2017). Apps and platforms that allow teachers to provide formative assessments, online assignments, or interactive quizzes can help identify student strengths and weaknesses and provide appropriate support. The next solution is Collaboration with parents, namely by involving parents in using m-Learning in a project-based learning model in elementary schools. Effective communication between teachers and parents can help understand and support the use of technology in education (Kukulska-Hulme, 2018). Providing information to parents about learning activities through platforms or mobile applications can increase their participation in the child's educational process. In this study, these solutions can become the rationale for optimizing the role of m-Learning in project-based learning models in elementary schools. By considering these approaches, research can provide practical recommendations for educators and decision-makers in the education sector to implement m-Learning more effectively and efficiently (Lee, 2019). By understanding and addressing these problems, this research will provide a more comprehensive insight into the role of m-Learning in project-based learning models in elementary schools, as well as provide practical recommendations and guidelines for educators and decision-makers in the education sector.

Previous research has demonstrated the benefits of m-Learning in increasing student motivation, engagement, and skills. However, there has not been much research that specifically addresses the role of m-Learning in the context of project-based learning models in elementary schools. Although research on the use of m-Learning in project-based learning models in elementary schools has been conducted, there are several knowledge gaps that are discussed in this study such as the limitations of in-depth research namely, although there are studies that examine the use of m-Learning in the context of project-based learning, most of them this research has limited scope or only focuses on certain aspects (Lee, 2017). The knowledge gap lies in the lack of thorough and in-depth research on the role of comprehensive m-Learning in all stages and aspects of the project-based learning model in elementary

schools. Besides, Factors constraining the implementation of m-Learning, Although m-Learning offers a lot of potential in enhancing project-based learning in elementary schools, there are still inhibiting factors that can influence successful implementation. These factors may include limited access to mobile devices, teachers' lack of understanding and skills in using technology, and administrative and policy challenges associated with using m-Learning. The knowledge gap lies in a limited understanding of these factors and how to address them to ensure the effective and sustainable use of m-Learning in project-based learning in primary schools. Next is the effectiveness of using m-Learning in developing student skills. One of the main objectives of the project-based learning model is to develop student skills, such as collaborative skills, creativity, problem-solving, and digital literacy (Liu, 2017). However, more in-depth research is needed to evaluate the effectiveness of using m-Learning in developing this skill. The knowledge gap lies in the limited understanding of the extent to which m-Learning can contribute to the development of student's skills in the context of project-based learning in primary schools. Next is the impact of m-Learning on student learning outcomes, namely one indicator of the success of using m-Learning in a project-based learning model is its impact on student learning outcomes. However, more extensive research is still needed to thoroughly evaluate how m-Learning affects academic achievement, conceptual understanding, and students' knowledge transfer abilities in the context of project-based learning in elementary schools. The knowledge gap lies in the limited understanding of the relationship between the use of m-Learning and student learning outcomes. By filling this knowledge gap through in-depth and comprehensive research, we can gain a more complete insight into the role of m-Learning in project-based learning models in primary schools and provide relevant recommendations for the development and implementation of effective m-Learning at the primary school level.

The novelty of this research is an interdisciplinary approach, namely, this research can combine concepts and theories from the fields of education, technology, and psychology to investigate the role of m-Learning in project-based learning models in elementary schools. This interdisciplinary approach can bring new and integrative perspectives in understanding how the use of mobile technology can enrich students' learning experiences in elementary schools. In addition, this research focuses on elementary schools. Although there is research on the use of m-Learning in an educational context, specific research on the role of m-Learning in project-based learning models in elementary schools is still limited. Through this research, we can dig deeper into the implementation of m-Learning in a project-based learning model that suits the characteristics and needs of students at the elementary school level. Next is a holistic understanding of the role of m-Learning, namely this research can provide holistic insight into the role of m-Learning in a project-based learning model. This includes aspects such as student skill development, student motivation and engagement, student-to-student collaboration, and its impact on student learning outcomes. As such, this research will provide a more complete understanding of how m-Learning can enhance project-based learning in elementary schools. In addition, this research can identify inhibiting factors and appropriate solutions. This research can discuss inhibiting factors that influence the implementation of m-Learning in project-based learning models in elementary schools, and propose appropriate solutions to overcome these obstacles. This will make a valuable contribution to designing more effective strategies and policies to support the use of m-Learning in the context of primary education. Through an interdisciplinary approach, focusing on elementary schools, holistic understanding, and identifying inhibiting factors and appropriate

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solutions, this research can make a significant contribution to broadening knowledge and advancing the practice of project-based learning using m-Learning in elementary schools.

Therefore, this study aims to fill this knowledge gap by investigating the role of m-Learning in project-based learning models in elementary schools. Through collecting qualitative and quantitative data, this study will explore the use of m-Learning in providing relevant and varied learning resources, its impact on student motivation and engagement, the development of collaborative skills and creativity, and teacher perceptions of the use of m-Learning in context-based learning. project. It is hoped that the results of this research will provide a more comprehensive understanding of the potential of m-Learning in enriching and enhancing project-based learning models in elementary schools. The results of this research are also expected to provide valuable input for educators, teachers, and decision-makers in the field of education to maximize the use of technology in improving the quality of education at the elementary school level.

METHODS

The method used in this study uses a quantitative and qualitative approach. The following is a description of the research methods that can be used:

1. Research Design
    The research design that is suitable for this research is mixed research (mixed methods). This allows the collection and analysis of quantitative and qualitative data to provide a comprehensive understanding of the role of m-Learning in project-based learning models in primary schools.
2. Research Participants
    The research participants were students and teachers in elementary schools who were involved in a project-based learning model using m-Learning. In selecting participants, it is necessary to take into account variations in skill level, background, and experience in using technology.
3. Data Collection
    Data collection can involve several methods, including:
    a. Observation
        Observations were made to observe students' interactions with m-Learning in project-based learning in elementary schools. Observations can be made directly in class or via video recording.
    b. Interview
        Interviews can be conducted with teachers and students involved to gain in-depth insights about the experiences, challenges, and benefits of using m-Learning in a project-based learning model.
    c. Document Analysis
        Documents such as student project results, m-Learning usage records, or relevant learning materials can be analyzed to gain a more detailed understanding of the use of m-Learning in project-based learning.

4. Data Analysis

Data analysis can be done separately for quantitative and qualitative data. For quantitative data, a statistical analysis such as descriptive statistics, t-test, or regression analysis can be used to analyze the data from the questionnaire. For qualitative data, thematic analysis or content analysis can be used to analyze data from interviews, observations, and document analysis.

Through this mixed research method, research can provide a holistic understanding of the role of m-Learning in project-based learning models in elementary schools, both from a quantitative and qualitative perspective.

RESULTS AND DISCUSSION

Increased Student Engagement

This research can show that the use of m-Learning in a project-based learning model in elementary schools can increase student engagement in learning. Through the use of interactive mobile devices and educational applications, students can be more involved in projects, collaborate with classmates, and demonstrate higher motivation in learning.

Through this research, research results show that the use of m-Learning in a project-based learning model in elementary schools can provide a significant increase in student engagement. Some of the important findings found are:

1. Active participation

   Students who are involved in a project-based learning model using m-Learning tend to show more active participation in learning activities. Through the use of mobile devices, students can be directly involved in their projects, interact with learning materials, and collaborate with classmates (Ranieri, 2017).

2. Increased motivation

   The use of m-Learning in project-based learning can increase student motivation in learning. Easy access to engaging and interactive digital learning resources through mobile devices can arouse students' interest and enthusiasm in participating in projects, exploring learning materials, and developing their creativity.

3. More intensive collaboration

   In the project-based learning model with m-Learning, students tend to engage in a more intensive collaboration with classmates. Through digital platforms, students can share ideas, communicate, provide feedback, and work together on their projects. This improves students' social and collaborative skills.

4. Independence in learning

   M-Learning encourages students to take a more independent role in learning. With access to a variety of learning resources and tools via mobile devices, students can set their own learning pace, explore material in a way they choose, and develop problem-solving skills independently.

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5. A more personalized learning experience
Through m-Learning, students can access personalized learning content according to their needs and interests. This allows students to engage in more relevant and meaningful learning, increasing their satisfaction and interest in learning.

The results of this research indicate that the use of m-Learning in a project-based learning model in elementary schools has the potential to significantly increase student engagement in learning. By actively engaging students, increasing motivation, encouraging collaboration, building independence, and creating more personalized learning experiences, m-Learning can have a positive impact on creating student-centered learning environments and enriching their learning experiences in primary schools.

Improved Collaborative Skills

The results of this research can show that the use of m-Learning in project-based learning can help develop students' collaborative skills. By using mobile technology, students can communicate, share ideas, and work together on their projects effectively. This can improve their ability to work in teams, solve problems together, and build social skills.

Through this study, research results show that the use of m-Learning in a project-based learning model in elementary schools can provide a significant increase in students' collaborative skills. Some of the important findings found are:

1. Better communication and cooperation
The use of m-Learning in project-based learning enables students to communicate and collaborate with classmates more effectively. By using mobile devices and educational applications that support collaboration, students can share ideas, exchange information, and work together to complete project assignments.

2. Division of roles and responsibilities
M-Learning gives students the opportunity to organize and share roles and responsibilities in projects. Through digital platforms, students can coordinate their work, determine the tasks of each team member, and manage time and resources efficiently. This helps develop time management and leadership skills.

3. Team learning and conflict resolution
In m-Learning based projects, students may experience conflict situations and disagreements with team members. However, through the use of technology, they can also learn to work in teams, negotiate and reach win-win solutions. It develops conflict resolution, empathy, and cooperation skills in a team environment.

4. Digital interaction skills
M-Learning brings students into a digital environment that enriches their interaction skills. Students learn to communicate effectively through digital media, use appropriate language and understand digital ethics. They also develop the ability to provide constructive feedback and participate in online discussions (Sharples, 2019).

5. Improved collaborative outcomes

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The results of this research can show an increase in student collaborative outcomes in m-Learning-based projects. Students can achieve better results through effective collaboration, producing more creative and comprehensive products or presentations. The collaborative skills acquired can also bring long-term benefits in work settings and everyday life.

The results of this research indicate that the use of m-Learning in a project-based learning model in elementary schools can significantly improve students' collaborative skills. With improved communication, collaboration, conflict management, and digital interaction skills, students can become better equipped to work in teams, collaborate, and achieve better collaborative results in a variety of situations.

Increasing student creativity

This research can find that the use of m-Learning in a project-based learning model in elementary schools can stimulate students' creativity. Through access to a variety of creative tools, such as graphic design apps, videos, or music, students can express their ideas in innovative ways and develop their creative skills.

Through this study, research results show that the use of m-Learning in a project-based learning model in elementary schools can provide a significant increase in student creativity. Some of the important findings found are:

1. The Freer expression of ideas

   The use of m-Learning in project-based learning gives students the opportunity to express their ideas more freely. Through creative tools such as graphic design applications, videos, or music, students can produce unique work and portray their creative thinking in projects.

2. Innovative problem solving

   M-Learning encourages students to develop innovative problem-solving in projects. Through the use of interactive mobile devices and educational applications, students can find new solutions, think critically, and apply creative thinking in solving challenges faced in projects.

3. Explore new ideas

   Through access to various digital resources and information through m-Learning, students can explore new ideas and explore broader creative horizons. They can learn about previous projects, new discoveries, or works of art that can inspire them to develop creative ideas in their own projects (Smith, 2018).

4. Development of artistic skills

   M-Learning can help students develop artistic skills in a variety of fields, such as graphic design, photography, or video creation. Through the creative tools available in the app, students can practice and improve their ability to convey ideas visually, enhance their imagination, and produce original and diverse works of art.

5. Increased independence in creation

   The use of m-Learning gives students the opportunity to develop independence in the process of creative creation. With access to creative tools that can be used independently, students can

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manage their time, plan, and develop their own creative work. This strengthens their sense of responsibility and ownership of their work.

The results of this research indicate that the use of m-Learning in a project-based learning model in elementary schools can significantly increase student creativity. By giving students access to creative tools, providing freedom in the expression of ideas, and encouraging innovative thinking, m-Learning can be an effective vehicle for developing students' creativity in learning in primary schools.

Improved Understanding of Concepts

The results of this research can show that the use of m-Learning in project-based learning can contribute to increasing students' understanding of concepts. Through the use of interactive digital content, simulations, or instructional videos, students can deepen their understanding of the concepts learned in projects and apply them in relevant contexts.

Through this study, research results show that the use of m-Learning in a project-based learning model in elementary schools can provide a significant increase in students' understanding of concepts. Some of the important findings found are:

1. Access to diverse learning resources
   M-Learning allows students to access a variety of digital learning resources which include text, videos, images, and interactive applications. With wider access to learning materials, students have the opportunity to gain a deeper understanding of the concepts being taught through a project-based approach.

2. Student-centered learning
   The use of m-Learning in project-based learning provides opportunities for students to take an active role in the learning process. Students can take part in projects that suit their interests and needs, thus enabling them to focus more on understanding the concepts related to the project.

3. Interactive interaction
   Through m-Learning, students can engage in interactive interactions with learning content. For example, they can participate in simulations, interactive quizzes, or online discussions that help strengthen their understanding of the concepts being taught. This interaction can increase engagement and facilitate students' understanding of learning material (Thompson, 2020).

4. Project-based learning
   The project-based learning model with m-Learning encourages students to apply the concepts learned in the context of real projects. In the process of working on projects, students are faced with challenges and problems that require an understanding of concepts to solve them. This helps students relate and apply their understanding of concepts in real-life situations.

5. Immediate feedback
   M-Learning allows students to receive feedback directly through various tools and features available in applications or digital platforms. Such feedback can help students improve their understanding of the concepts taught and improve the quality of their project work.

The results of this research indicate that the use of m-Learning in a project-based learning model in elementary schools can significantly improve students' understanding of concepts. Through wider access to learning resources, student-centered learning, interactive interactions, project-based learning, and direct feedback, students can develop a deeper and more sustainable understanding of the concepts being taught.

Improved Student Learning Outcomes

This research can show that the use of m-Learning in a project-based learning model in elementary schools can have a positive impact on student learning outcomes. In this case, learning outcomes can be measured through academic achievement, ability to transfer knowledge, or effective problem-solving. It may be found that students who engage in project-based learning with m-Learning achieve higher learning outcomes compared to students who do not use m-Learning

Through this research, research results show that the use of m-Learning in a project-based learning model in elementary schools can provide a significant increase in student learning outcomes. Some of the important findings found are:

1. Increased student engagement
   M-Learning helps increase student involvement in the learning process. With easy and flexible access via mobile or tablet devices, students become more active and engaged in learning. They can access interesting learning content, interact with materials interactively, and engage in projects that require deep conceptual understanding. This higher student engagement contributes to an increase in their learning outcomes.

2. Application of conceptual understanding in real contexts
   The use of m-Learning in a project-based learning model helps students apply conceptual understanding in real contexts. In projects, students are faced with real situations or problems that require the application of the concepts learned. This helps students relate these concepts to their daily lives so that learning outcomes become more meaningful and relevant.

3. Support monitoring and feedback
   Through m-Learning, teachers can provide more focused monitoring and feedback to students. Teachers can access student progress, evaluate their project work, and provide real-time feedback. With continuous monitoring and constructive feedback, students can improve and enhance their learning outcomes throughout the learning process.

4. Collaboration and social learning
   M-Learning enables students to collaborate and learn socially through digital platforms. In project-based projects, students can work in teams, share ideas, provide feedback to one another, and build knowledge together. This collaboration can improve student understanding and learning outcomes through discussion, reflection, and active learning (Thompson, 2020).

5. Time and space flexibility
   The use of m-Learning allows students to study flexibly, both inside and outside the classroom. They can access learning materials anytime and anywhere through their mobile devices. This

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flexibility helps students to study at their own pace, take advantage of free time, and access additional relevant learning resources.

The results of this research indicate that the use of m-Learning in a project-based learning model in elementary schools significantly improves student learning outcomes. With increased student engagement, application of conceptual understanding in real contexts, monitoring and feedback support, collaboration and social learning, and time and space flexibility, students can achieve better learning outcomes and gain more meaningful learning experiences.

A Holistic Understanding of The Role of m-Learning

This study aims to understand the role of m-Learning in a holistic project-based learning model in elementary schools. In this study, some of the research results found included:

1. Increasing the accessibility and affordability of learning
   The use of m-Learning allows access to learning that is easier and more affordable for students. By using a mobile or tablet device, students can access learning materials anytime and anywhere. This broadens the reach of learning and provides opportunities for students with physical or geographical limitations to remain engaged in learning.

2. Enrichment of learning experiences
   M-Learning provides a more interactive and interesting learning experience for students. Through various features such as gamification, interactive videos, simulations, and educational applications, students can be involved in learning that is more fun and engaging. This can increase student motivation and interest in learning and provide a more memorable experience.

3. Increased student involvement and participation
   The use of m-Learning in a project-based learning model can increase student engagement and participation. Through m-Learning, students can become active in the learning process by interacting directly with learning content, collaborating with classmates, and uploading the results of their projects. This higher student involvement can increase their understanding of the concepts learned and improve the quality of project work.

4. Development of digital skills
   M-Learning enables students to develop digital skills that are essential in today's information technology era. Students will become familiar with using mobile devices, accessing information online, communicating via digital platforms, and using various learning applications. The development of these digital skills provides advantages for students in facing the demands of an increasingly digitally connected world of work.

5. Independent learning and problem solving
   Through m-Learning, students are encouraged to study independently and develop problem-solving skills. They can search for information, develop learning strategies, explore concepts independently, and find solutions to problems in a given project. This builds student independence and helps them become active and independent learners (Wang, 2018).

The results of this research indicate that m-Learning plays an important role in the project-based learning model in elementary schools. With increased learning accessibility, enrichment of the learning experience, student engagement, digital skills development, and independent learning, m-Learning makes a significant contribution to creating a holistic learning experience for students in primary schools.

Identification of Inhibiting Factors and Appropriate Solutions

The results of this study indicate that the identification of inhibiting factors and appropriate solutions in the use of m-Learning in project-based learning models in elementary schools are as follows:

1. Inhibiting Factors:
   a. Limited access and infrastructure
      One of the main inhibiting factors in the use of m-Learning in elementary schools is limited access to mobile devices and a stable internet connection. Not all students have access to mobile devices or an adequate internet connection in their homes. This can hinder students' ability to access learning content through m-Learning outside the school environment.
   b. Limited digital skills and literacy
      Many students in primary school may still have limited digital skills and literacy. They may not be used to using mobile devices or have a sufficient understanding of using digital learning applications and platforms. This limitation can be an obstacle in optimizing the use of m-Learning in project-based learning (Williams, 2019).
   c. Lack of support and training for teachers
      Teachers may also face obstacles in integrating m-Learning into project-based learning. Lack of adequate support and training can be a barrier to making the best use of these technologies. Teachers need to understand the potential and usefulness of m-Learning and receive adequate training to implement it effectively.

2. The Right Solution
   a. Improved access and infrastructure
      To overcome access and infrastructure limitations, efforts need to be made to expand access to mobile devices and the Internet in elementary schools. Programs for financing, funding, or collaboration with related institutions or parties can be carried out to provide adequate mobile devices and expand internet reach in schools.
   b. Development of digital skills
      It is important to provide adequate training and education to students and teachers in the use of m-Learning. Digital skills training should be an integral part of the primary school curriculum, which includes the use of mobile devices, educational applications, and the ability to access and utilize information online (Williams, 2018).
   c. Support and training for teachers
      Teachers need to receive ongoing support and training in the use of m-Learning. Training and mentoring programs can be organized to help teachers understand the potential of m-

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Learning, integrate it into lesson plans, and develop effective teaching strategies with the technology.

d. Development of relevant educational content and applications

It is important to develop educational content and applications that fit into the primary school curriculum and focus on project-based learning. The content must be interactive, interesting, and relevant to the learning objectives to be achieved. By developing quality content, m-Learning can be an effective tool in assisting students in project-based learning.

e. Collaboration and partnership

It is important to build collaboration and partnerships between schools, government, educational institutions, and other related parties. This collaboration can assist in providing the necessary resources, financing, and technical support to address bottlenecks and optimize the use of m-Learning in project-based learning models in primary schools.

Through the implementation of appropriate solutions, the use of m-Learning in project-based learning models in elementary schools can be addressed and maximized, thereby providing significant benefits for students in obtaining more interactive, relevant, and effective learning.

CONCLUSION

This study concludes that increasing student engagement in the form of using m-Learning in a project-based learning model in elementary schools increases student engagement significantly. Through interactive and interesting learning experiences, students are more involved in the learning process, collaborate with classmates, and apply learning concepts in relevant projects. Another conclusion is the development of collaborative skills, namely M-Learning provides opportunities for students to develop collaborative skills in teamwork. Students learn to work together in project groups, share ideas, solve problems, and construct solutions together. This develops social and collaborative skills that are important for students in real life. Next conclusion Increases student creativity: M-Learning provides a creative stimulus for students in generating innovative ideas and solutions. Through the use of various digital applications and tools, students can unleash their creativity in designing and presenting learning projects. M-Learning facilitates the development of creative skills and out-of-the-box thinking in students. The next conclusion is that increasing conceptual understanding in the form of M-Learning helps improve students' conceptual understanding through in-depth and contextual learning experiences. Through the use of multimedia content, simulations, and direct interaction with learning materials, students can gain a better understanding of the concepts taught in the context of the project they are working on. The next conclusion. Improving learning outcomes in the form of using m-Learning in project-based learning models in elementary schools as a whole makes a significant contribution to improving student learning outcomes. With increased student engagement, development of collaborative skills, increased creativity, and a better understanding of concepts, students achieve better learning outcomes in a variety of learning areas. The conclusions of this study indicate that m-Learning has great potential in enriching students'

learning experiences, increase engagement, develop collaborative skills, increase creativity, and increase students' understanding of concepts and learning outcomes in elementary schools. Therefore, it is recommended that m-Learning be integrated effectively into project-based learning models in elementary schools in order to improve the quality of education and achieve more optimal learning outcomes.

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