

Conceptual Article

The Integration of Mobile Learning Framework with Project-Based Learning: A Conceptual Paper

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Abstract: Mobile learning (m-learning) is one alternative to electronic media-based learning (e-learning) for delivering knowledge and skills. In the context of Project-Based Learning (PjBL), integrating mobile learning with PjBL plays a crucial role in creating more competent graduates, especially in the field of Technical and Vocational Education and Training (TVET). Despite the many advantages of this integration, its implementation is still limited. There is a lack of comprehensive guidelines for educators to refer to in the teaching and facilitation process (PdPc). Therefore, this conceptual study aims to develop a conceptual framework for integrating mobile learning with Project-Based Learning (PjBL) in the context of TVET for Vocational Colleges. This study emphasises the component and elements of mobile learning in cooperation with Project Based Learning. This study aligns with SDG 4, which supports quality education and encourages lifelong learning opportunities to empower individuals with knowledge and high-level skills, thereby driving professional development and learning. Moreover, this framework will enhance and support advancing teaching and facilitation processes (PdPc) by integrating cutting-edge technology into education.

Keywords: Mobile Learning; Project-Based Learning; Technical and Vocational Education and Training (TVET)

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1. Introduction

The rapid development of information and communication technology has impacted nearly every aspect of life, including education. The teaching and learning process is no longer confined to the classroom; it can now take place anywhere and at any time. The education system has undergone another evolution in educational technology with the introduction of mobile learning or mobile learning (m-learning) to enhance teaching and learning. Mobile Learning has also been introduced to enrich educational approaches that align with current needs as the COVID-19 pandemic sweeps nationwide. Online learning has

become the new norm in the education system nationwide, and Malaysia is no exception to this change. In this situation, Mobile Learning has become a widely used trend for conducting virtual teaching and facilitation sessions (PdPc) at all levels of educational institutions. Teaching and facilitation sessions (PdPc) have been transformed into Home-Based Teaching and Learning (PdPR) due to the contagious nature of the virus (Alturki & Aldraiweesh, 2022)

The transformation has influenced educational institutions in Malaysia, leading to the emergence of virtual learning or e-learning. Among the institutions affected are Vocational Colleges. Technical and Vocational Education and Training (TVET) is one of the critical fields in education that integrates information technology to enhance productivity. It aligns with Vocational Colleges' goal, which is to produce highly skilled graduates who align with technological advancements and current industry needs (Damit & Omar, 2019). This educational transformation is carried out to positively impact student learning development (Hamzah & Yeop, 2016). TVET's view of learning is based on the students' learning styles and preferences. They like learning using visual aids that provide simulation connected to topic content (Rahman *et al.*, 2022). The implementation of mobile learning requires an implementation method that is relevant to Vocational education.

However, the use of mobile learning (m-learning) in the technical and vocational education and training (TVET) system is still relatively new (Ridzuan, 2020). The teaching and facilitation (PdPc) process at Vocational Colleges is still in the old paradigm, following conventional and teacher-centred methods (Thangaiah *et al.*, 2020). The traditional or conventional teaching methods still prevalent in today's teaching and learning sessions will not meet the demands of 21st-century education, which emphasizes technology-assisted learning environments (Jumaat, 2017; Rahim, 2013). To navigate 21st-century learning (PAK21), educators must apply pedagogy that incorporates new and relevant strategies, approaches, methods, and learning techniques suitable for the era of globalization and information technology (Aini & Atikah, 2021). Technology clearly demands a change in the methods and teaching approaches used by lecturers in the classroom. Thus, in line with the explosion of computer-based knowledge and technology, Project-Based Learning (PjBL) is one of the approaches teachers use in the teaching and learning process.

Students' participation in the process should be promoted in the learning environment. One strategy that enables students to participate more actively in the learning process is Project-Based Learning or PjBL (Al-khrisha *et al.*, 2021). Implementing Project-Based Learning (PjBL) in vocational education has shown more effective results than traditional learning methods (Sudjimat, 2016). Contemporary learning emphasizes skill processes and active learning, making mobile learning increasingly important. Integrating mobile learning with Project-Based Learning is one of the new alternatives that can be implemented in vocational technology education (Sugiyanto *et al.*, 2020). One of the factors influencing the success of implementing PjBL with technology integration is the learning framework (Gómez-Pablos *et al.*, 2017). Therefore, this concept paper is designed to build a proposed framework for mobile learning based on Project-Based Learning in vocational colleges.

Several research objectives have been outlined to serve as study guidelines. This step is necessary to ensure the planned research goals can be fully achieved. Among these research objectives are:

1. To explore the elements of the mobile learning and project-based learning.
2. To explore the sub-elements of the mobile learning and project-based learning
3. To develop a framework that integrates mobile learning with project-based learning.

2. Literature Review

2.1 Mobile Learning

With the development and evolution of educational technology, mobile learning has been introduced to enhance teaching and learning (Yusoff & Romli, 2018). Mobile Learning, or M-Learning, is an instructional method that utilizes mobile devices in teaching and learning (Jahawi & Junaini, 2018). Mobile learning generally encompasses four definitions: the connection with distance education and e-learning, the exploitation of devices and technology, interaction with technology, and the nomadic nature of learners and learning (Grant, 2019). The implementation of mobile learning provides an opportunity to offer new teaching and learning methods that ultimately enhance the performance of students and teachers (Chen & Tsai, 2021). By allowing access anywhere and anytime, mobile learning opens up a new way to interact, collaborate, learn, and innovate, whether in classrooms, libraries or homes (Zaki & Sabli, 2020). The media technology of M-Learning can connect educators and students in real-time or virtually to experience the teaching and learning process, thereby supporting lifelong learning (Demir & Akpınar, 2018).

The goal of using media in the learning process is to make it possible for it to happen in a way that maximizes student interest and attentiveness (White & Martin, 2014). Learning through M-learning methods is easy to implement as it can be done anywhere and is not confined to a specific location (Aziz & Sieng, 2021). M-Learning is easily carried out through gadgets, especially mobile phones, which have become a necessity for students and as learning media and assist them in utilizing M-Learning methods in their education. Mobile devices are technological mediums equipped with features such as text and multimedia messaging, sending and receiving emails, and applications with instant messaging services combined with multimedia elements like sound, images, animations, and videos (Abd Rashid *et al.*, 2016). Mobile learning can also enhance access to current materials, facilitate collaboration and strengthen student engagement (Aini & Atikah, 2021).

Implementing mobile learning in TVET undeniably brings many benefits. Among the positive impacts of mobile learning is that it provides high opportunities for TVET students to be accepted into employment and adapt to the industry (Azmi *et al.*, 2017). The Internet use by vocational students serves as a platform that significantly assists students in enhancing

their understanding and expanding their knowledge in learning and teaching (Rani *et al.*, 2022). Integrating mobile applications increases the amount of information. It reduces costs and time wasted travelling to the institute, leading to the effectiveness of the technical and vocational courses (Mohammadi *et al.*, 2017). Therefore, teachers can leverage the opportunities provided by 21st-century innovations by diversifying the methods used to impact students positively (Roslin & Salleh, 2021).

Technology clearly demands a change in teachers' methods and teaching approaches to learning. It cannot be denied that teachers are vital and central figures in implementing technology for mobile learning, involving students through appropriate pedagogy (Miglani & Awadhiya, 2017; Papadakis, 2018). This is because the critical success factors related to mobile learning essentially depend on the willingness of students and their intellectual involvement in mobile learning activities (Sarrab *et al.*, 2016). When teachers use and model various forms of technology, they indirectly engage students actively and create a learning environment that stimulates student development (Nawzad *et al.*, 2018). Mobile learning has the potential to accelerate, enrich, develop, and deepen skills, to motivate, encourage, and engage students, to help connect school experiences with workplace practices, to provide economic advancement for future workers, and to strengthen teaching and support school change (Aziz & Sieng, 2021; Jumaat, 2017; Roslin & Salleh, 2021). Therefore, it can be concluded that mobile learning impacts education. Recognizing the transformative impact of mobile learning on education, the subsequent focus on project-based learning unfolds as a strategic continuation of this narrative.

2.2 Project-Based Learning

According to the Ministry of Education, Technical and Vocational Education and Training (TVET) is more oriented towards enhancing students' practical capabilities to prepare them for the future workplace. Students learn how to improve their performance and skills. TVET equips students to be competent in the workforce (Schwendimann *et al.*, 2018). Implementing Project-Based Learning methods where students independently exhibit behavior at the higher education level is necessary to enhance their competence (Hidayah *et al.*, 2015). The learning model emphasized and implemented in vocational education is Project-Based Learning (PjBL) (Kusumaningrum & Djukri, 2016). The project-based learning model is considered relevant in the implementation of the learning process for vocational technology education because It is a teaching method that can be applied (Li, 2015).

Project-based learning (PjBL) is one approach that allows students to engage more deeply in the learning process (Megayanti *et al.*, 2020). This paper uses the abbreviation 'PjBL' to represent Project-Based Learning, distinguishing it from the acronym 'PBL,' which refers to Problem-Based Learning. Definitions of project-based learning (PjBL) vary according to researchers' perspectives. The ideas of John Dewey inspire this approach. He emphasized the idea of 'learning by doing,' asserting that this approach should be encouraged

in the learning process (Du & Han, 2016). Based on John Dewey's definition, a project is an in-depth, extended investigation into a topic that requires attention, time, and energy. Project-based learning (PjBL) is typically carried out by the entire class, small groups of students, or individually, both in the short and long term (Maidin, 2022).

PjBL differs from traditional teaching as it emphasizes learning through student-centred activities across disciplines and integrates it into real-world situations (Rahman, 2018). Project-based learning allows students to engage in learning situations by applying ideas and producing a project (Sulong & Sulong, 2022). In their project engagement, students may encounter problems that need to be addressed to construct and present a final product in response to the questions (Kokotsaki *et al.*, 2016). Students primarily learn by building knowledge and making meaning through iterative processes of questioning, active learning, collaboration, and reflection, also improving the competencies of students in a PjBL environment for vocational higher education (Almulla, 2020; Hidayah *et al.*, 2015).

Integrating PjBL methods makes teaching and learning processes exciting and compelling and positively impacts student learning (Isa & Azid, 2021). Moreover, Project-Based Learning and short-term project-oriented research in technical and vocational higher education can facilitate training and enhance skills (Hasanefendic *et al.*, 2016). Many essential strategies are taught to enhance 21st-century skills, such as critical thinking, the use of digital resources, high-level thinking skills, and problem-solving skills, which can also be acquired through the innovative approach of PjBL (Baysura *et al.*, 2016; Bell, 2010). Introducing and enhancing these skills for vocational students becomes increasingly important to prepare them to adapt to the rapidly changing workforce (Megayanti *et al.*, 2020). Ideally, this approach involves acquiring useful knowledge, understanding, and concepts across various disciplines.

Project-Based Learning (PjBL) can be implemented in various collaborative online learning environments (Inoue *et al.*, 2020). Integrating mobile learning with Project-Based Learning is one of the new alternatives that can be implemented in education at vocational colleges (Sugiyanto *et al.*, 2020). Technology can enhance the effectiveness of PjBL by strengthening interactivity and facilitating smoother communication, easing task completion, interdisciplinary approaches, and problem-based education for real-world situations (Gómez-Pablos *et al.*, 2017). Projects can be created and shared using technology, and website materials can help create an environment that reflects real-life contexts (Azmi *et al.*, 2017; Mirascieva, 2010). Technology-based learning has several advantages over its counterpart, making project-based learning (PjBL) features more effective.

3. Development of Conceptual Framework

This study's proposed conceptual framework explains the components and elements involved, as depicted in a visual diagram. Figure 1 illustrates the study's conceptual framework, encompassing the study's variables. The initial stage involves exploring and identifying components and elements to develop the framework for implementing mobile

learning with project-based learning in Vocational Colleges. This exploration process is undertaken to develop the framework for integrating mobile learning with Project-Based Learning (PjBL). Therefore, the researcher first identifies the components of mobile learning by reviewing past studies and previous mobile learning models. Each component and element will be developed as the framework for integrating mobile learning with project-based learning, which will be based on the validation of experts in the relevant field of the study being conducted.

The conceptual framework (Figure 1) for this study encompasses several steps outlined:

3.1 Literature Review and Mobile Learning Models

The exploration process begins with a study of existing literature and mobile learning models. This aims to identify relevant elements of project-based learning and mobile learning.

3.2 Interviews with Experts

The findings from the literature review and models serve as a foundation for conducting interviews with experts in the relevant field of the study. These interviews aim to explore sub-elements of Mobile Learning with Project-Based Learning deemed necessary in TVET education in vocational colleges.

3.3 Approval and Validation of Elements and Sub-Elements

Elements and sub-elements identified through literature review and expert interviews will be organized and submitted for approval and validation by the experts involved in the study.

3.4 Construction of Integration Framework

After the elements and sub-elements are approved and validated by experts, the next step is constructing an integration framework between Mobile Learning and Project-Based Learning (PjBL) in vocational colleges. This involves arranging these elements and sub-elements into a coherent framework relevant to the TVET education context.

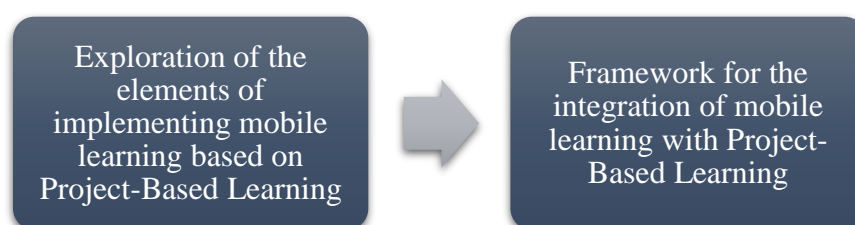


Figure 1. Conceptual Framework of the Study

4. Conclusion

This concept paper proposes an integrated mobile learning model with Project-Based Learning in Vocational College. This study focuses on TVET perspectives and the input from experts and educators. Thus, this discovery could assist educators in developing instructional materials, especially for technology-based project-based learning, which can significantly enhance the learning process. Combining the elements should enable educators to improve learning strategies from conventional ways. This concept is expected to serve as a reference for institutions and the education sector, ensuring the sufficiency of interactive and productive vocational mobile learning.

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Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this article.

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