

The Implementation of Project Based Learning in the Concrete Practice Course

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ABSTRACT

A learning model that can be implemented in the Stone and Concrete Practice course is the Project Based Learning (PjBL) model, which emphasizes project-based learning. The objective of this research is to provide a description of the implementation of project-based learning in the stone and concrete practice courses. This study employs a Pre-Experimental Design utilizing a One-Shot Case Study design. The instrument utilized in this research is the assessment of skills in Project Based Learning. From the results of the study it can be interpreted that the application of Project Based Learning in the Stone and Concrete Practice course obtains the proportion of Respondent Achievement Level (TCR) of the six assessment components of 83.85% which belongs to the good category. Consequently, the application of the Project Based Learning learning model in the Stone and Concrete Practice course leads to an improvement in students' masonry and concrete work skills.

Keywords: Project Based Learning; Stone; Concrete.

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INTRODUCTION

A good education system allows students to explore their own potential. In such a situation, the education system should encourage collaboration and creative thinking among students regarding concepts and issues involving various fields. As creative thinkers, students try various ways to think of alternative concepts.[1]. Essentially, the mission of education is to create a context that facilitates students in developing their creativity, intelligence, potential, and skills. Its primary goal is to enable students to grow and actively contribute to society, both in their personal capacities and as members of the community.[2]. Education is intended to nurture students' potential to become individuals who are honest, morally upright, talented, innovative, and self-reliant.[3].

Universitas Negeri Padang, a renowned institution of higher education in West Sumatra, has a strong reputation with nine faculties and a well-accredited graduate program. Currently, Universitas Negeri Padang is gearing up to become a world-class university through various initiatives, including education, research, leadership, resources, and service programs. The Department of Civil Engineering is tasked with producing self-reliant students. The Concrete and Stone Practice is one of the practical courses conducted within the Department of Civil Engineering. The theoretical and practical content of this course should be read, understood, studied, and practiced by the students. Students must actively engage in the learning process within this course.[4].

The learning objectives consist of many essential elements, including students, instructors, the environment, learning materials, teaching models, and how all these elements interact with each other during the learning process. To achieve the learning objectives, each of these elements strives to influence one another. The learning model is a crucial component in achieving learning objectives and focuses on structuring the classroom based on the teaching model applied by the instructor.[5].

A learning model is defined as a general pattern of learning behavior. Learning models can also be used to design ongoing lesson plans, develop teaching materials, and organize learning activities both in the classroom and outside of it. [6] [7]. Data obtained from interviews with instructors teaching the Concrete and Stone Practice course indicate that the instructors have already implemented a student-centered learning model in the course. However, there are still many students who are not actively engaged in the learning process, which has resulted in a high number of students having low levels of concrete and stone work skills, despite the Concrete and Stone Practice course being a mandatory subject for Civil Engineering students. This situation will have a significant impact on students' learning activities, interest in learning, skills, and motivation in the learning process. It will also affect the students' future prospects. When students are not actively engaged in the learning process, the consequences can include boredom, apathy, and a decline in motivation to learn. As a result, students' concrete and stone work skills become low, and there is a lack of connection among students in the learning process. This does not align with the principles of self-directed learning.[8]. The government is making efforts to prepare human resources in higher education through a curriculum innovation known as "Merdeka Belajar," which translates to "Independent Learning" in English. (Direktorat Pendidikan Tinggi, 2020). The mission of "Merdeka Belajar" is to enhance graduates' abilities in various aspects, including interpersonal and technical skills, so that they can meet the challenges of the current era. This program also aims to prepare graduates to have good character, achieve excellence, and become proactive leaders in advancing the nation.[10].

The inactivity of students in the learning process can hinder the active development of knowledge and skills.[11]. In the Concrete and Stone Practice course, diversity and innovation are crucial in the learning process. One tactic that can be employed is choosing the right teaching model. An effective learning process will result in improved student understanding, skills, and engagement in the teaching and learning process. With enhanced understanding, motivation, skills, and student engagement, it is expected that the learning outcomes of students will also improve.[12].

Project-Based Learning (PjBL) is one of the teaching approaches that can be utilized in the Concrete and Stone Practice course, which is a learning model centered around projects. In PjBL, the project is considered an integral part of the learning process. Projects involve thinking, visualization, and functionality, which means that learning through projects can foster creative development and encourage independent learning responsibility in individuals. The implementation of PjBL has a significant impact on the quality of individual behavior and requires a different approach to conventional methods of learning. Complex tasks based on specific problems or questions are referred to as projects. Students are actively involved in activities such as designing, problem-solving, making decisions, and conducting investigations related to the given project. It provides an opportunity for students to work independently over a significant period of time and produce tangible products or presentations.[13]. This aligns with the goals of "Merdeka Belajar," which aim to provide students with opportunities to apply the knowledge, technology, and skills they possess and

collaborate with various stakeholders in real-life situations.

By implementing Project-Based Learning, it is expected to emphasize learning that is related to real-world objects, enabling the exploration and enhancement of students' academic potential. This approach can also enhance students' creative abilities and encourage them to become more proactive in the learning process.

MATERIALS AND METHODS

This research employs a Pre-Experimental Design with a One-Shot Case Study design. The study was conducted at the Faculty of Engineering, Padang State University, specifically within the Department of Civil Engineering, during the semester from January to June 2023. The subjects of this research are one class of 10 students who are enrolled in the Concrete and Stone Practice course during the even semester of January to June 2023. The research process involves three stages.

Preparation is the first stage, implementation is the second stage, and completion is the third stage. In this research, data is collected through the use of a Project Based Learning skills assessment questionnaire. The assessment data will serve as the primary data for this research. A project-based skills assessment questionnaire is utilized in this research. The validation of the instrument used in this study involves expert judgment, employing a descriptive data analysis technique.

RESULTS AND DISCUSSION

In this research, an evaluation of students' concrete and stone work skills is conducted by implementing the Project-Based Learning model. This assessment is carried out on 10 students from the Department of Civil Engineering who are enrolled in the Concrete and Stone Practice course during the even semester of January to June 2023. There are 6 assessment components that have been tested and utilize the Respondent Achievement Level (TCR) formula in the analysis process. Here is the elaboration:

1. Preparation Phase of Work

The assessment of the preparation phase of work components for 10 students with 4 statement items resulted in a Respondent Achievement Level (TCR) score of 86.5%. This indicates that the assessment of students' preparation phase of work in the application of the Project-Based Learning model in the Concrete and Stone Practice course can be categorized as good.

2. Work Process Phase

The assessment of the work process phase components for 10 students with 8 statement items resulted in a Respondent Achievement Level (TCR) score of 83.25%. This indicates that the assessment of students' work process phase in the application of the Project-Based Learning model in the Concrete and Stone Practice course can be categorized as good.

3. Work Results

The assessment of work outcomes for 10 students using 5 statements yielded a data processing result indicating a Respondent Achievement Level (TCR) score of 86.8%. This indicates that the assessment of the work outcomes of students who applied the Project Based Learning model in the Concrete Practice course can be categorized as good.

4. Work Ethic

The assessment of work attitude components for 10 students using 2 statements yielded a data processing result indicating a Respondent Achievement Level (TCR) score of 80%. Based on these results, it can be concluded that the assessment of the work attitude of students who used the Project Based Learning model in the Concrete Practice course can be categorized as good.

5. Time

The assessment of the time management component for 10 students using 1 statement yielded a data processing result indicating a Respondent Achievement Level (TCR) score of 82%. From this finding, it can be concluded that the assessment of the time management of students who applied the Project Based Learning model in the Concrete Practice course can be categorized as good.

6. Report

The assessment of the report component for 10 students with 3 assessment sub-components is as follows:

a. Chapter I Planning

The assessment of the sub-component Chapter I (planning) for 10 students with 3 statements yielded a data processing result indicating a Respondent Achievement Level (TCR) score of 76%. This means that the assessment of Chapter I (planning) by students using the Project Based Learning model in the Concrete Practice course is considered quite good.

b. Chapter II Implementation

The assessment of the sub-component Chapter II (implementation) for 10 students with 2 statements yielded a data processing result indicating a Respondent Achievement Level (TCR) score of 80%. This means that the assessment of Chapter II (implementation) by students using the Project Based Learning model in the Concrete Practice course is considered good.

c. Chapter III Final

The assessment of the sub-component Chapter III (closure) for 10 students with 2 statements yielded a data processing result indicating a Respondent Achievement Level (TCR) score of 94%. This means that the assessment of Chapter III (closure) by students using the Project Based Learning model in the Concrete Practice course is considered very good.

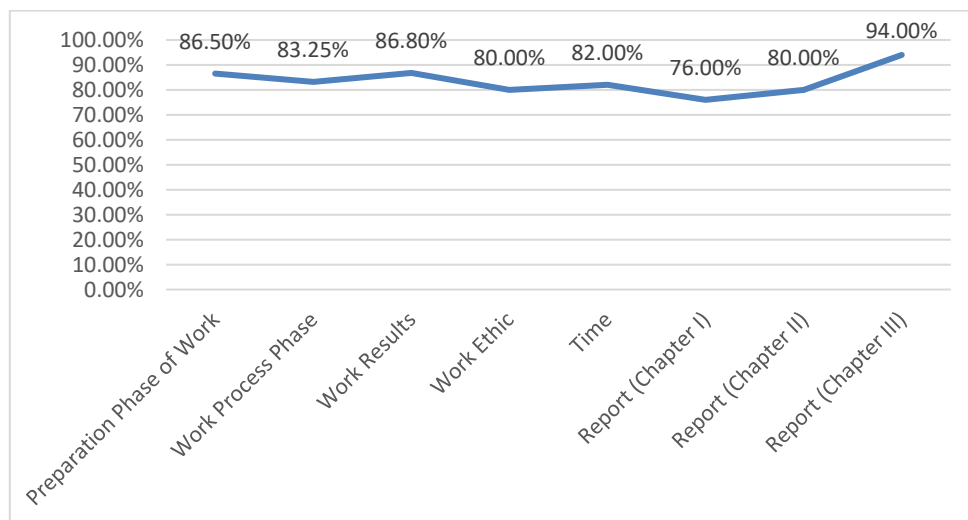


Figure 1. Respondent Achievement Level (TCR) score chart

In the Concrete Practice course, students develop skills related to working with concrete and masonry materials, particularly in the context of structural work on buildings. In an effort to enhance their understanding and application of these concepts, the Project Based Learning model is employed. The research results indicate that students have successfully achieved a good level of skill development in this area. By implementing the project-based learning approach, students not only grasp the theory but also apply that knowledge in real-life situations. These findings suggest that the Project Based Learning model is effective in stimulating active student engagement and promoting practical application of learning concepts in the real world. Therefore, this learning approach provides sustainable benefits for the development of skills and understanding among students in the context of structural work using concrete and masonry materials.

Concrete evidence of the success of this approach is reflected in the Respondent Achievement Level score, which reached a figure of 83.85%. The assessment conducted consists of six main components, including the work preparation phase, the work process phase, the resulting work outcomes, demonstrated work attitude, efficient time management, and the ability to compile adequate reports.

The figure indicates a positive level of achievement in each of these assessment components. Therefore, it can be concluded that the implementation of the Project Based Learning model significantly helps students develop concrete and masonry skills in the context of structural work on buildings. The positive response from students, as reflected in the Respondent Achievement Level score, illustrates the effectiveness of this learning approach in facilitating a comprehensive and impactful learning process.

Through the implementation of the Project Based Learning approach, there has been a significant increase in students' interest in the practical content being taught. This serves as a strong motivator that ignites their enthusiasm and motivation to actively develop their skills. In this context, the project-based learning approach has successfully created an engaging and attractive learning environment, allowing students to feel more involved in the practical learning process. As a result, the enthusiasm for learning and actively participating in skill development continues to grow, supporting holistic and sustainable development in students' abilities.

CONCLUSION

Based on the findings of the research, it can be concluded that the use of the Project Based Learning model in the Concrete Practice course results in a Respondent Achievement Level (TCR) percentage of 83.85% across the six assessment components, which can be categorized as good. This indicates an improvement in the concrete and masonry skills of students in the Concrete Practice course through the implementation of the Project Based Learning model.

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