

The Influence of Problem-Based Learning and Motivation On Learning Outcomes

Tri Herwidyatmono ^{1*}, Bachtiar Sjaiful Bachri ², Andi Kristanto ³

^{1,2,3} Universitas Negeri Surabaya, Indonesia

* triherwidyatmono@gmail.com

Abstract

This study aims to examine the impact of the Problem-Based Learning (PBL) model and motivation on the learning outcomes of 11th-grade students at SMA Negeri 3 Bojonegoro in the subject of Pendidikan Kewarganegaraan (PKN). The sample consisted of two classes: an experimental class using PBL and a control class using the discovery learning method. In general, students with higher motivation tended to have better learning outcomes. The Two-Way ANOVA analysis results showed that learning motivation ($F(3, 65) = 33.481, p < 0.001$) and teaching methods ($F(1, 65) = 4.069, p = 0.048$) significantly influenced learning outcomes. However, there was no significant interaction between motivation and teaching methods ($F(2, 65) = 0.840, p = 0.436$). The model explained about 69.3% of the variation in student learning outcomes ($R^2 = 0.693$), indicating that motivation and teaching methods together significantly contribute to student learning outcomes.

Keywords: *Problem Based Learning; Motivation; Learning Outcomes, Two-Way ANOVA*

Introduction

Learning is the process of interaction between teachers and students along with its elements. Teachers play the most dominant role in determining the quality of learning. Naturally, high-quality learning leads to good learning outcomes. Learning is a personal experience that expands knowledge, perspectives, skills, and understanding through interaction with others and experiences (Shemshack et al, 2020). Meanwhile, learning refers to the process of enhancing one's knowledge through reading, sensory use, adapting to new environments, and establishing principles in life (Peche et al, 2019). This study is based on observations with subject teachers who found that students' learning outcomes in the topic of System and Dynamics of Pancasila Democracy are still not optimal (Rotgans et al, 2019). From these results, it was found that lack of student learning motivation is one of the main factors affecting their academic achievement. The observations indicate that students tend to be less enthusiastic, and their active participation in the learning process is minimal. This suggests the need for a more effective approach to enhance student learning motivation to achieve better learning outcomes (Argaw et al, 2016).

SMA Negeri 3 Bojonegoro, which holds an A accreditation, offers Civic Education (PKN) subject for grade 11 focusing on the System and Dynamics of Pancasila Democracy. The goal of this learning is to deepen students' understanding of democracy in Indonesia and its comparison with previous periods such as the Old Order, New Order, and Reform. However, field observations show that students are less enthusiastic, minimally participate actively, and

have limitations in responding to the material. A teacher-centered approach results in low interest and understanding among students towards the subject, reflected in test results where most students have not yet reached the minimum competency standards (KKM). It is recommended that schools adopt a more student-centered learning approach, enhance learning motivation through better support from teachers and peers, and adjust practical content to be more relevant to students' daily lives. These steps are expected to improve learning outcomes and student interest in understanding and applying key concepts from PKN learning (Fukuzawa et al, 2017).

This study focuses on three main variables: Problem-Based Learning (PBL), Learning Outcomes, and student motivation. The main goal of this research is to investigate the impact of PBL implementation on student learning motivation in an educational context. PBL was chosen as a teaching method expected to increase student engagement and strengthen their understanding of the subject matter (Safitri et al, 2023). Analysis of the relationship between PBL and learning motivation is expected to provide deeper insights into how teaching approaches can influence students' motivation levels in the teaching and learning process (Pratiwi et al, 2020). The selection of this learning model is supported by the opinion of stating that Problem-Based Learning (PBL) methods can increase student engagement with real-life problems. PBL encourages students to actively participate in the learning process, thus not solely relying on information provided by teachers (Nicholus et al, 2023). With this approach, students are encouraged to think critically and creatively in finding solutions to real problems, which in turn can enhance their motivation and learning outcomes. This opinion supports the need for PBL implementation to create a more dynamic and effective learning environment.

Problem-Based Learning (PBL) approach described promotes more active learning engagement by using real-life problems. In this approach, learners are exposed to real-life situations that challenge them to think critically, collaborate, and solve problems independently (Timor et al, 2021). Thus, learners become more involved in the learning process and not just rely on information provided by teachers. This is expected to enhance their ability to apply knowledge and skills acquired in class to everyday life situations. This approach emphasizes active student participation in finding solutions and solving real problems. Problem-Based Learning (PBL) is a learning method that focuses on contextual problems that require investigation to find solutions (Meilasari et al, 2020). Students work in groups to handle problems, identify shortcomings in their learning, and develop appropriate solutions (Ali, 2019). They gain new information through self-directed learning, with teachers acting as facilitators, ultimately helping to develop critical thinking and problem-solving skills (Arisetiyana et al, 2020).

Learning motivation, as described, is the internal and external drive that influences students in adopting behavioral changes (Uno, 2021). This drive can originate from factors such as personal interest, needs to be fulfilled, and the surrounding environment. Interprets motivation as a process that drives individuals to act in accordance with motives or goals they want to achieve. In this context, motives and motivation are closely intertwined and inseparable in students' behavior (Uno, 2021). Therefore, a deep understanding of personal motives and supporting factors is highly relevant for students so they can develop strong motivation to

achieve their academic and personal goals. When learning motivation is lacking, its impact can significantly affect students' success in the learning process. Emphasizes that learning success depends on a strong level of motivation from students (Cahyani et al, 2020). This motivation can stem from within (intrinsic), such as personal interest and satisfaction, or from external sources (extrinsic), such as recognition or rewards.

Learning obstacles, such as frustration, lack of confidence, or despair, often arise from internal individual factors (Kanyesigye et al, 2022; Chang et al, 2020). Students may experience difficulties in behavior, physical abilities, thinking processes, and personal development, all of which affect their progress in achieving educational and life goals (Simbolon et al, 2020). High motivation in students not only affects the quantity of learning but also its quality (Azhar et al, 2022). When students feel motivated, they tend to experience deeper and more meaningful learning experiences. They actively seek information, ask questions, and strive to understand the concepts taught. This means that high motivation not only drives students to learn for the sake of achieving good academic results but also makes them more engaged and emotionally invested in the learning process (Siew et al, 2017; Ananda et al, 2023).

Furthermore, studies cited affirm that strong motivation plays a crucial role in enhancing students' academic achievements (Rukiyanto et al, 2023). When students are motivated, they are more likely to show consistent efforts in studying course materials, develop effective learning strategies, and overcome obstacles that may arise during the learning process. High motivation can also strengthen students' self-confidence and enhance satisfaction with their personal achievements (Siew et al, 2017; Ananda et al, 2023). Thus, high motivation not only influences students' academic achievements but also shapes their learning attitudes and behaviors overall (Yusa et al, 2023; Kang et al, 2018). This underscores the importance of encouraging and maintaining student motivation in the classroom, both through recognition of their achievements and by creating a learning environment that supports their exploration and personal growth (Aslan et al, 2021; Audrey et al, 2019).

Method

This study employed a quantitative approach with an experimental design, specifically applying a Quasi-Experimental Design. This approach was chosen to enable researchers to control most variables influencing the research outcomes, although not entirely as in true experimental designs. Explains that Quasi-Experimental Design is a development from true experimental designs, considering practical constraints in establishing an ideal control group (Susena et al, 2024). In this context, the study utilized a Non-equivalent Control Group Design to address these challenges. The primary aim of this research was to evaluate the impact of problem-based learning and motivation on student learning outcomes before and after treatment (Khusaini et al, 2018). The study employed pre-tests and post-tests, where the experimental group received problem-based learning while the control group received conventional learning. The research population included all grade 11 students at SMA Negeri 3 Bojonegoro in the academic year 2023/2024. The sample consisted of students from classes XI-1 and XI-2 at SMA

Negeri 3 Bojonegoro in the same year, with each class comprising 36 students. Sampling was conducted randomly to ensure fair representation of the population.

To measure motivation, researchers utilized a questionnaire developed based on instruments and theories from experts whose validity had been previously verified (Siregar et al, 2023). Meanwhile, student learning outcomes were measured using tests relevant to the learning material. Student motivation was categorized into several levels, namely very low, low, moderate, high, and very high, to understand the variation in their learning motivation. Data analysis was performed using Two-Way ANOVA, a statistical technique allowing researchers to evaluate the effects of two different factors (i.e., type of learning and level of motivation) on student learning outcomes. This analysis was supported by IBM SPSS 27 statistical software to ensure the accuracy and validity of the research findings.

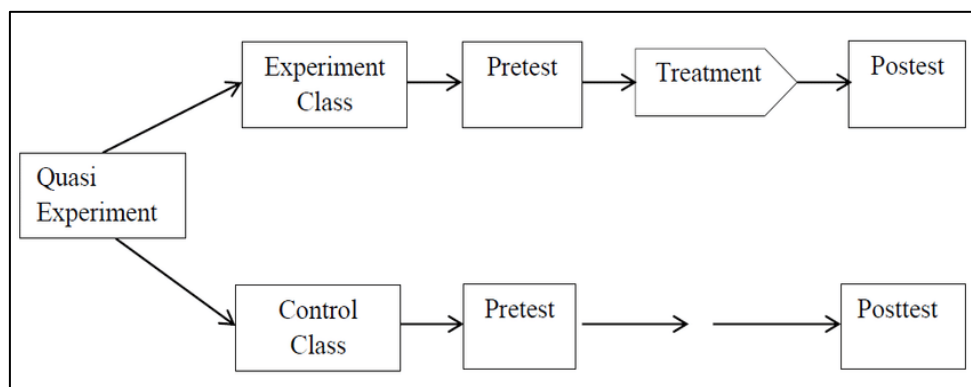


Figure 1. Quasi-Experimental Design

Results

Here are the results of the study on the influence of Problem-Based Learning (PBL) and motivation on student learning outcomes, as depicted in the following table:

Table 1. Descriptive Statistics (Tests of Between-Subjects Effects)

Dependent Variable: Learning Outcomes						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	2600.109 ^a	6	433.352	24.511	.000	
Intercept	203099.876	1	203099.876	11487.447	.000	
Motivasi	1775.835	3	591.945	33.481	.000	
Metode	71.944	1	71.944	4.069	.048	
Motivasi * Metode	29.698	2	14.849	.840	.436	
Error	1149.210	65	17.680			
Total	474361.000	72				
Corrected Total	3749.319	71				

a. R Squared = .693 (Adjusted R Squared = .665)

Descriptive statistics in the above table indicate differences in the mean learning outcomes (HB) between groups of students with different levels of motivation and between PBL and Conventional classes. Generally, students with higher motivation tend to achieve better learning outcomes, both in PBL and Conventional classes. Additionally, the average learning outcomes of students in the PBL class are higher compared to those in the Conventional class. However,

to ascertain whether these differences are statistically significant, further analysis using Two-Way ANOVA is necessary.

Table 2. Tests of Between-Subjects Effects

Dependent Variable: HB						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	2600.109 ^a	6	433.352	24.511	.000	
Intercept	203099.876	1	203099.876	11487.447	.000	
Motivasi	1775.835	3	591.945	33.481	.000	
Metode	71.944	1	71.944	4.069	.048	
Motivasi * Metode	29.698	2	14.849	.840	.436	
Error	1149.210	65	17.680			
Total	474361.000	72				
Corrected Total	3749.319	71				

a. R Squared = .693 (Adjusted R Squared = .665)

The results of the Two-Way ANOVA analysis indicate that learning motivation ($F(3, 65) = 33.481, p < 0.001$) and teaching method ($F(1, 65) = 4.069, p = 0.048$) significantly influence student learning outcomes. This suggests that both student motivation levels and the teaching methods used independently affect their learning outcomes. However, no significant interaction was found between motivation and teaching method ($F(2, 65) = 0.840, p = 0.436$). This indicates that the influence of motivation on learning outcomes does not vary significantly across different teaching methods employed.

The model incorporating motivation, teaching method, and their interaction explains approximately 69.3% of the variation in student learning outcomes ($R^2 = 0.693$). This indicates that the combined effects of motivation and teaching method significantly contribute to student learning outcomes in the context of this study.

Discussion

This study adopts a quantitative approach with an experimental design, particularly applying Quasi-Experimental Design. This approach was chosen to allow researchers to control most of the variables influencing the research outcomes, although not entirely as in true experimental designs. Explains that Quasi-Experimental Design is an extension of true experimental designs that considers practical constraints in establishing an ideal control group (Susena et al, 2024). In this context, the study utilizes Nonequivalent Control Group Design to address these challenges. The primary objective of this research is to evaluate the impact of Problem-Based Learning (PBL) and motivation on students' learning outcomes before and after treatment. The study employs pre-tests and post-tests, where the experimental group receives PBL while the control group undergoes conventional learning. Analysis is conducted to compare the learning outcomes between these two groups. The study population includes all 11th-grade students at SMA Negeri 3 Bojonegoro in the academic year 2023/2024. The sample consists of students from classes XI-1 and XI-2 at the same school year, with each class comprising 36 students. Sampling was done randomly to ensure fair representation of the population. To measure motivation, researchers used a questionnaire developed based on instruments and theories from experts that had been previously validated for their reliability. This instrument helped

identify the level of student motivation influencing their engagement in the learning process. Meanwhile, student learning outcomes were measured using tests designed to cover materials learned in both problem-based and conventional learning.

The results of the two-way ANOVA analysis indicate that both learning motivation ($F(3, 65) = 33.481, p < 0.001$) and teaching method ($F(1, 65) = 4.069, p = 0.048$) significantly influence students' learning outcomes. This analysis validates that both student motivation levels and the use of PBL statistically contribute positively to their learning outcomes. Students who participated in problem-based learning showed significant improvements compared to those in conventional learning.

This finding is consistent with research, which addresses the impact of Problem-Based Learning (PBL) on students' learning outcomes in Civic Education (PKN) (Zulfa et al, 2023). Their study utilized a quantitative approach with an experimental method, specifically employing a Pre-Experimental Design, particularly the One-Group Pretest-Posttest Design. Sampling was conducted using total sampling techniques, involving 25 students from class V SDN 1 Setia Aceh Barat Daya. Data analysis of pretest and posttest scores on the water cycle using the PBL model showed that the average pretest score was 41.40, while the average posttest score was 87.80. Hypothesis testing with paired samples t-test statistics showed a significance value (2-tailed) of 0.000, which is less than 0.05. Thus, it can be concluded that there is a significant impact of using Problem-Based Learning (PBL) on the learning outcomes of Civic Education (PKN) students in class V SDN 1 Setia Aceh Barat Daya, in addition to study, which indicated that the learning motivation of eighth-grade students at MASS Irsyadul Islamiah was highly positive (Julyanti et al, 2021). This is evident from the motivation indicator values obtained and the distribution of students, where 4 students (15%) were highly motivated, 13 students (68%) were moderately motivated, and 5 students (17%) were low motivated. Therefore, it can be concluded that there is a significant influence of learning motivation on students' learning outcomes. Based on the findings and research discussions, it is recommended that teachers continuously encourage their students' self-confidence. This is expected to enhance students' learning motivation, encourage them to study diligently, and optimize their potential, aiming for better learning outcomes.

However, no significant interaction was found between motivation and teaching method ($F(2, 65) = 0.840, p = 0.436$). This indicates that the impact of motivation on learning outcomes does not vary significantly among the different teaching methods used. These results affirm that students' motivation consistently influences their academic achievement, regardless of the type of learning method applied. The model incorporating motivation, teaching method, and their interaction explains approximately 69.3% of the variability in students' learning outcomes ($R^2 = 0.693$). This suggests that the combined effects of motivation and teaching method significantly contribute to students' academic achievement in this research context. Thus, this study provides a deep understanding of how these factors interplay in the learning context.

These findings are consistent with study, which also found no significant interaction between the use of teaching models and learning motivation on mathematics learning outcomes

(Winahyu, 2024). In conclusion, both independent variables use of PBL and learning motivation significantly influence students' learning outcomes. This underscores the importance of motivating and supportive teaching strategies and high levels of student motivation in achieving optimal academic success.

Conclusion

Students with higher motivation tend to achieve better learning outcomes, whether in problem-based learning (PBL) or conventional classroom settings. Two-way ANOVA analysis indicates significant effects of both learning motivation ($F(3, 65) = 33.481, p < 0.001$) and teaching method ($F(1, 65) = 4.069, p = 0.048$) on student academic performance independently. However, there was no significant interaction found between motivation and teaching method ($F(2, 65) = 0.840, p = 0.436$), suggesting that the influence of motivation on learning outcomes remains consistent across different instructional approaches. These findings underscore the importance of fostering student motivation and selecting appropriate teaching methods to enhance academic achievement in educational settings.

Acknowledgment

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