



## The Effect of Project-Based Learning (PjBL) on Student Motivation and Cooperative Attitudes

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### Articles Information

### Abstrak

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Penelitian ini bertujuan untuk mendeskripsikan motivasi belajar dan sikap gotong royong peserta didik serta mengetahui pengaruh penggunaan model Project- Based Learning (PjBL) terhadap motivasi belajar dan sikap gotong royong peserta didik kelas V pada pembelajaran IPAS di SD Muhammadiyah 1 Pontianak. Penelitian ini menggunakan pendekatan kuantitatif dengan desain pre-experimental one-group pretest-posttest. Sampel penelitian berjumlah 26 peserta didik kelas V yang dipilih secara purposive sampling. Teknik pengumpulan data menggunakan angket motivasi belajar dan lembar observasi sikap gotong royong. Data dianalisis menggunakan uji normalitas Kolmogorov-Smirnov dan uji Paired Samples t-test. Hasil penelitian menunjukkan bahwa data berdistribusi normal ( $p > 0,05$ ). Uji hipotesis menunjukkan nilai signifikansi 0,000 ( $p < 0,05$ ), yang berarti terdapat pengaruh signifikan penggunaan model PjBL terhadap motivasi belajar dan sikap gotong royong peserta didik. Effect size motivasi belajar sebesar 5,115 dan sikap gotong royong sebesar 3,946 yang termasuk dalam kategori tinggi. Dengan demikian, penerapan model PjBL berpengaruh tinggi dalam meningkatkan motivasi belajar dan sikap gotong royong peserta didik pada pembelajaran IPAS materi sistem pencernaan manusia.

### Abstact

This study aims to describe the learning motivation and mutual cooperation attitude of students and to determine the effect of the use of the Project-Based Learning (PjBL) model on the learning motivation and mutual cooperation attitude of fifth-grade students in science learning at Muhammadiyah 1 Elementary School Pontianak. This study uses a quantitative approach with a pre-experimental one-group pretest-posttest design. The research sample consisted of 26 fifth-grade students selected by purposive sampling. The data collection technique used a learning motivation questionnaire and a mutual cooperation attitude observation sheet. Data were analyzed using the Kolmogorov-Smirnov normality test and the Paired Samples t-test. The results showed that the data were normally distributed ( $p > 0.05$ ). The hypothesis test showed a significance value of 0.000 ( $p < 0.05$ ), which means there is a significant effect of the use of the PjBL model on the learning motivation and mutual cooperation attitude of students. The effect size of learning motivation was 5.115 and mutual cooperation attitude was 3.946 which is included in the high category. Thus, the application of the PjBL model has a high influence in increasing students' learning motivation and mutual cooperation attitude in learning science on the human digestive system material.



## INTRODUCTION

Educational advancement in Indonesia largely depends on how stakeholders respond to contemporary societal changes. The national curriculum continues to evolve to ensure that the education system remains relevant to current developments. Indonesia has recently implemented the Merdeka Curriculum, which aims to cultivate the Pancasila Student Profile. This profile encompasses six key dimensions: (1) faith and devotion to God Almighty and noble character, (2) independence, (3) cooperation (gotong royong), (4) global diversity, (5) critical reasoning, and (6) creativity.

As part of curriculum reform, the government has integrated Natural Sciences (IPA) and Social Sciences (IPS) into a unified subject called Natural and Social Sciences (IPAS) at the elementary school level. This integration aims to enhance educational relevance and effectiveness by providing students with a holistic understanding of their environment while instilling character values (Kemendikbud, 2022). IPAS encourages collaboration and problem-solving, making it an appropriate medium for developing both social and cognitive skills essential for 21st-century learning.

Learning motivation is defined as the internal drive that encourages students to achieve learning goals. According to Pratama et al. (2019), motivation represents an inherent capacity within students to pursue achievement. In teaching and learning processes, motivation is crucial because, without it, meaningful learning activities cannot occur. Motivation functions as a driving force for achievement and performance (Harahap et al., 2021). Strong motivation, combined with persistent effort, significantly influences students' learning attainment (Suprihatin, 2015).

The selection of learning motivation and cooperative attitudes as the main variables in this study is grounded in contemporary educational theory, which emphasizes the balance between cognitive, affective, and social competencies. Based on Self-Determination Theory (SDT) proposed by Deci and Ryan, intrinsic motivation develops optimally when individuals' basic needs for autonomy, competence, and relatedness are fulfilled. In the IPAS learning context, collaborative project work can satisfy these needs, thereby enhancing students' intrinsic motivation.

Furthermore, cooperative attitudes align with Vygotsky's social constructivist theory, which posits that learning occurs most effectively through social interaction and collaboration. Cooperation is not only a cultural value in Indonesia but also an essential 21st-century social skill required to face global challenges. Strengthening cooperative attitudes in IPAS learning is therefore both relevant and strategic within the framework of the Pancasila Student Profile.

Preliminary observations at SD Muhammadiyah 1 Pontianak revealed that although the Merdeka Curriculum had been implemented, innovative learning models had not been optimally applied. Students demonstrated low learning motivation, characterized by a lack of persistence in completing tasks, easy

discouragement, and frequent complaints when facing difficulties. Diagnostic assessments indicated that most students exhibited low interest in learning. Additionally, only approximately 30% of students actively participated in group discussions, while the remaining 70% preferred working individually.

One learning model widely implemented within the Merdeka Curriculum is Project-Based Learning (PjBL), which is expected to enhance both motivation and collaboration. Previous studies have demonstrated that PjBL significantly improves cooperative character and learning motivation (Hamidah, 2024; Mahendra, 2023). Conceptually, PjBL integrates SDT principles—by fostering autonomy, competence, and relatedness—and Vygotsky’s social constructivism—by facilitating knowledge construction through collaboration within the Zone of Proximal Development (ZPD). Therefore, this study investigates how the integration of autonomy, collaboration, and social construction principles in PjBL affects students’ learning motivation and cooperative attitudes.

## **METHOD**

This study employed a pre-experimental one-group pretest–posttest design. A single group of students was administered a pretest, followed by instructional treatment using the Project-Based Learning (PjBL) model, and subsequently a posttest to measure changes in learning motivation, cooperative attitudes, and learning outcomes (Arikunto). The research population consisted of all fifth-grade students at SD Muhammadiyah 1 Pontianak, comprising two classes. The research sample was Class V-A, consisting of 26 students, selected through purposive sampling based on class availability and the teacher’s willingness to participate.

The independent variable in this study was the implementation of the PjBL model, while the dependent variables were students’ learning motivation and cooperative attitudes. Learning motivation was measured using the following indicators:

- (1) persistence in completing tasks;
- (2) resilience in facing difficulties;
- (3) independence from external encouragement for achievement;
- (4) willingness to deepen knowledge in the given subject area;
- (5) striving to achieve optimal performance;
- (6) enthusiasm and diligence in learning, including the ability to defend one’s opinions and reduced boredom toward routine tasks; and
- (7) enjoyment in seeking and solving problems (Uno, as cited in Mayasari & Johar, 2023).

Cooperative attitudes were measured based on three indicators: collaboration, caring, and sharing (Kemdikbud, 2022). Data were collected using several instruments. First, a learning motivation questionnaire consisting of 19 Likert-scale statements was administered to measure motivation indicators.

Second, an observation sheet was used to record students' cooperative behaviors during the learning process. Third, a learning achievement test was administered in the form of IPAS questions on the topic of the human digestive system.

Data were analyzed using inferential statistics. The Kolmogorov–Smirnov test was conducted to assess data normality ( $p > 0.05$ ). Hypothesis testing was performed using the Paired Samples t-test to compare pretest and posttest scores. The alternative hypothesis ( $H_a$ ) was accepted if the significance value (2-tailed) was less than 0.05. The magnitude of the effect was calculated using Cohen's  $d$  effect size, categorized as small (0.2), medium (0.5), and large ( $\geq 0.8$ ) (Djudin & Yani).

## **RESULT AND DISCUSSION**

This study aimed to examine the effect of implementing the Project-Based Learning (PjBL) model on fifth-grade students' learning motivation and cooperative attitudes in IPAS instruction at SD Muhammadiyah 1 Pontianak. The research was conducted at SD Muhammadiyah 1 Pontianak and employed an experimental approach using a single class as the sample. The sample consisted of 26 students from Class V-A, including 14 male and 12 female students. The study measured the effect of the PjBL model on students' learning motivation and cooperative attitudes in IPAS learning.

The learning motivation indicator "striving to achieve optimal performance" (86.92%) obtained a significantly higher percentage compared to the other indicators. The implementation of project-based activities appeared to encourage students to compete with themselves and strive for personal excellence. In contrast, the indicator "not requiring external encouragement to achieve" (82.05%) showed a relatively lower percentage than the others. This finding suggests that environmental influences cannot be entirely eliminated, as students remain affected by parents, teachers, and peers. Although PjBL fosters intrinsic motivation, it does not completely remove external motivational factors that are inherently embedded in students' social contexts.

This finding is consistent with Agistiawati and Asbari (2020), who state that one of the key factors influencing learning motivation is the learning environment, including family, classroom, and community settings. Overall, students' learning motivation increased after the implementation of the instructional treatment, with post-intervention scores exceeding 80%, which falls into the "good" category.

Prior to hypothesis testing, a normality test was conducted. The Kolmogorov–Smirnov test results for the pretest motivation questionnaire showed a statistic value of 0.134,  $df = 26$ , and  $Sig. = 0.200$  ( $p = 0.200$ ). Since  $p > 0.05$ , the pretest data were normally distributed. Similarly, the posttest results showed a statistic value of 0.151,  $df = 26$ , and  $Sig. = 0.134$  ( $p = 0.134$ ), indicating that the posttest data were also normally distributed.

The results of the Paired Samples t-test for learning motivation revealed the following:

The mean pretest score was 55.00 ( $n = 26$ ,  $SD = 2.912$ ).

The mean posttest score increased to 80.08 ( $n = 26$ ,  $SD = 4.059$ ).

The t-value was -26.148,  $df = 25$ , with  $Sig. (2-tailed) = 0.000$  ( $p < 0.05$ ).

Since  $p < 0.05$ , the alternative hypothesis ( $H_a$ ) was accepted. Therefore, it can be concluded that the implementation of the PjBL model significantly improved fifth-grade students' learning motivation in IPAS instruction at SD Muhammadiyah 1 Pontianak, particularly on the topic of the human digestive system. Furthermore, the effect size calculation yielded a Cohen's  $d$  value of 5.115, which falls into the high category. This result indicates that the PjBL model had a strong effect on enhancing students' learning motivation.

The cooperative attitude indicator "collaboration" (82.53%) obtained a significantly higher percentage compared to the other indicators. This finding indicates that the implementation of the PjBL model positively influenced students' cooperative attitudes, particularly through project activities such as designing posters and constructing diagrams of the human digestive system. During classroom activities, students appeared highly enthusiastic in discussions, voluntarily divided tasks, and actively expressed their ideas. Communication among group members was effective and well-coordinated. Overall, the percentage of cooperative attitudes among Class V-A students at SD Muhammadiyah 1 Pontianak reached 82.53%, which falls within the "good" category (76%–85%). This result demonstrates that the application of the PjBL model contributed to the improvement of students' cooperative attitudes.

Prior to hypothesis testing, a normality test was conducted. The Kolmogorov–Smirnov test results for cooperative attitude scores before the implementation of PjBL showed a statistic value of 0.156,  $df = 26$ , and  $Sig. = 0.105$  ( $p = 0.105$ ). Since  $p > 0.05$ , the pre-intervention data were normally distributed. Similarly, the post-intervention results showed a statistic value of 0.164,  $df = 26$ , and  $Sig. = 0.070$  ( $p = 0.070$ ), indicating that the post-intervention data were also normally distributed.

The results of the Paired Samples  $t$ -test for cooperative attitudes revealed the following:

The mean pretest score was 19.85 ( $n = 26$ ,  $SD = 1.666$ ).

The mean posttest score increased to 28.77 ( $n = 26$ ,  $SD = 1.818$ ).

The  $t$ -value was -20.120,  $df = 25$ , with  $Sig. (2-tailed) = 0.000$  ( $p < 0.05$ ).

Since  $p < 0.05$ , the alternative hypothesis ( $H_a$ ) was accepted. Thus, it can be concluded that the implementation of the PjBL model significantly improved fifth-grade students' cooperative attitudes in IPAS learning at SD Muhammadiyah 1 Pontianak, particularly on the topic of the human digestive system. Furthermore, the effect size calculation yielded a Cohen's  $d$  value of 3.946, which falls into the high category. This indicates that the PjBL model had a strong effect on enhancing students' cooperative attitudes.

## CONCLUSION

Based on the findings and discussion, it can be concluded that the implementation of the Project-Based Learning (PjBL) model significantly influenced students' learning motivation and cooperative attitudes. The effect size calculation for learning motivation yielded a value of 5.115, which falls into the high category, indicating a substantial impact of the PjBL model on enhancing students' motivation. Similarly, the effect size for cooperative attitudes was 3.946, also categorized as high, demonstrating a strong influence of PjBL on improving students' collaborative behavior in the learning process. Therefore,

the implementation of the PjBL model has a strong positive effect on both students' learning motivation and cooperative attitudes.

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