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Problem-Based Learning for Enhancing Learning Motivation in Elementary Science and Social Studies

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ABSTRAK

Students' learning motivation in Science and Social Studies (IPAS) at SD Inpres 8 Mamboro was relatively low, as reflected in their limited participation and enthusiasm during classroom learning activities. Therefore, this study aimed to examine the effect of Problem-Based Learning (PBL) on students' learning motivation in IPAS. The study employed a quantitative approach using a quasi-experimental method with a Nonequivalent Control Group Design. The sample consisted of 26 students in the experimental group and 25 students in the control group. Data were collected using a learning motivation questionnaire based on six indicators: perseverance, resilience in facing difficulties, interest in problem-solving, independence, preference for challenges, and strong determination. The data were analyzed using descriptive statistics and an Independent Samples t-test. The results showed that the post-test mean learning motivation score of the experimental group ($M = 61.73$, $SD = 2.71$) was substantially higher than that of the control group ($M = 37.76$, $SD = 2.91$). Hypothesis testing revealed a statistically significant difference between the two groups ($t(49) = 30.503$, $p < .001$). Furthermore, the effect size analysis yielded a Cohen's d value of 8.544, indicating a very large effect. These findings demonstrate that Problem-Based Learning (PBL) is an effective instructional approach for enhancing students' learning motivation by providing meaningful, contextual learning experiences that actively engage students in IPAS.

INTRODUCTION

Education is a fundamental component of holistic human development, encompassing the formation of knowledge, attitudes, and character. These aspects are closely interconnected, as stated in the Regulation of the Minister of Education and Culture Number 66 of 2013, which emphasizes that education aims to develop individuals who possess broad knowledge as well as strong character reflected in their attitudes and skills (Riki & Kusno, 2023). Therefore, education plays a crucial role in shaping an intelligent and morally responsible generation. However, various challenges continue to hinder the achievement of educational goals. One important effort to address these challenges is enhancing students' learning motivation, as motivation plays a crucial role in improving students' engagement and academic achievement (Utari & Putra, 2021; Fernando et al., 2024).

Learning motivation is a driving force that encourages students to actively engage in educational activities. In addition to serving as an internal stimulus, motivation significantly influences students' engagement, persistence, and academic achievement (Suryanti et al., 2022). Students with high learning motivation tend to demonstrate persistence, active participation, engagement, and effective problem-solving abilities (Indradewi et al., 2025). They also show enthusiasm, determination, and commitment to learning activities (Astuti & Zulhakim, 2021). Therefore, teachers play an essential role in fostering students' motivation by creating learning environments that are supportive, creative, and innovative. Meaningful learning is closely related to students' real-life experiences, enabling them to better understand and apply the knowledge they acquire (Yasmini, 2021; Yunina, 2022).

The Indonesian subject *Ilmu Pengetahuan Alam dan Sosial* (IPAS), translated as Science and Social Studies, is an integrated subject that combines Natural Sciences and Social Sciences at the elementary school level. This integration is based on the characteristics of elementary school students, who generally perceive phenomena in a holistic and interconnected manner. Consequently, IPAS learning is expected to help students understand natural and social phenomena simultaneously (Fitria et al., 2025). Effective implementation of IPAS requires students to understand both scientific and social concepts while encouraging teachers to design engaging and meaningful learning experiences. Therefore, teacher creativity is essential in IPAS instruction, particularly following the implementation of the Merdeka Curriculum, in which IPAS is introduced beginning in Grade III (Wijaya et al., 2025).

Despite its importance, students' learning motivation in IPAS remains relatively low. Based on preliminary observations conducted in Grade III at SD Inpres 8 Mamboro, only 10 out of 30 students (33.33%) demonstrated high learning motivation, while the remaining 20 students (66.67%) exhibited low learning motivation. This condition is largely attributed to the predominance of teacher-centered instructional practices, particularly lecture-based methods, which limit students' active participation in the learning process. As a result, many students become disengaged, show little enthusiasm, and participate minimally during classroom activities. This situation ultimately affects students' involvement in IPAS learning activities (Permatasari & Purnomo, 2025).

These challenges highlight the need for an instructional model that can enhance students' learning motivation and participation. One instructional model that has the potential to address this issue is Problem-Based Learning (PBL), which emphasizes the development of students' problem-solving skills through authentic and meaningful learning experiences (Minar et al., 2020; Rahayu et al., 2026). In addition to increasing learning motivation, Problem-Based Learning contributes to the development of students' cognitive and intellectual abilities. Through this model, students are encouraged to develop problem-solving skills, become independent learners, and actively construct knowledge (Elmiwati et al., 2020). Furthermore, Problem-Based Learning has been shown to improve critical thinking skills, self-confidence, collaboration, and responsibility among students (Muhartini et al., 2023).

Several previous studies have demonstrated the effectiveness of Problem-Based Learning (PBL) in improving students' learning motivation. Hudzori (2023) found that the implementation of Problem-Based Learning significantly enhanced students' learning motivation in Economics subjects at the senior high school level. Similarly, Mardani et al., (2021) reported that Problem-Based Learning had a significant effect on both learning motivation and learning outcomes in Social Studies among

junior high school students. Furthermore, Fitria et al. (2024) revealed that Problem-Based Learning positively influenced learning motivation and science learning outcomes among fifth-grade elementary school students. These findings indicate that Problem-Based Learning has considerable potential to improve students' motivation across different educational levels and subject areas. However, several gaps remain in the existing literature. Most previous studies were conducted at the junior high school and senior high school levels, while research focusing on lower-grade elementary school students remains limited. In addition, earlier studies primarily examined learning motivation in Economics, Social Studies, or general Science subjects, whereas limited attention has been given to IPAS, an integrated subject introduced through the Merdeka Curriculum. Furthermore, few studies have explored the implementation of PBL through real-life energy-related problems, simple experimental activities, and concrete learning media suitable for Grade III elementary school students.

Therefore, this study addresses these gaps by examining the effect of the Problem-Based Learning (PBL) model on the learning motivation of Grade III students in the IPAS subject at SD Inpres 8 Mamboro. This study contributes to the existing literature by providing empirical evidence regarding the effectiveness of PBL among lower-grade elementary school students within the context of the Merdeka Curriculum. Moreover, the learning process integrates authentic problem-solving activities, simple experiments, and concrete learning media related to the topic "Energy Sources Around Us," thereby creating a more meaningful and engaging learning experience for students.

METHOD

This study employed a quantitative approach using a quasi-experimental method to examine the effect of the Problem-Based Learning (PBL) model on the learning motivation of Grade III students in the IPAS subject at SD Inpres 8 Mamboro. A quasi-experimental design was selected because the researcher was unable to randomly assign participants or fully control external variables that might influence the learning process. Therefore, the study adopted a Nonequivalent Control Group Design with a pre-post-test structure involving an experimental group and a control group.

Class III A was assigned as the experimental group, while Class III B served as the control group. These classes were selected because they shared similar academic characteristics, were at the same grade level, and had relatively comparable numbers of students. To minimize selection bias, the equivalence of the two groups was assessed using pre-test scores obtained before the treatment was implemented. The results indicated that the initial levels of learning motivation in both groups were relatively similar. In addition, both groups received the same learning materials, were allocated the same amount of instructional time, and were assessed using the same research instrument.

At the beginning of the study, both groups were administered a pre-test to measure their initial level of learning motivation. Following the pre-test, the experimental group received instruction through the implementation of the Problem-Based Learning (PBL) model, whereas the control group was taught using the conventional lecture method. After the treatment period, both groups were administered a post-test to measure changes in students' learning motivation and to determine the effect of the Problem-Based Learning (PBL) model on learning motivation (Amaliya & Anas, 2024).

This study was conducted at SD Inpres 8 Mamboro during the 2025/2026 academic year. The population consisted of all Grade III students, totaling 51 students from Class III A and Class III B. The study employed a saturated sampling technique, in which all members of the population were included as research participants. Class III A, consisting of 26 students, was assigned as the experimental group, while Class III B, also consisting of 25 students, served as the control group. The selection of these classes was based on their similar academic characteristics, equivalent grade level, comparable number of students, and recommendations from the classroom teacher.

To ensure the initial equivalence of the groups and minimize selection bias, pre-test scores were used to assess students' learning motivation before the treatment was implemented. The results indicated that the initial levels of learning motivation in both groups were relatively similar. In addition,

both groups received the same learning materials, were allocated the same amount of instructional time, and were assessed using the same research instrument throughout the study.

The data collected in this study consisted primarily of quantitative data obtained through a learning motivation questionnaire administered to students. Supporting data were collected through interviews to gather information about classroom learning conditions and through documentation to complement the research findings. Data collection was conducted in two stages. First, a pre-test was administered to both groups to measure students' initial levels of learning motivation. Subsequently, the experimental group received instruction using the Problem-Based Learning (PBL) model, while the control group was taught using the conventional lecture method. Following the treatment period, a post-test was administered to both groups to measure changes in students' learning motivation and to determine the effect of the Problem-Based Learning (PBL) model on students' learning motivation. (Waruwu, 2024)

This study examined both independent and dependent variables. The independent variable (X) was the Problem-Based Learning (PBL) model, whereas the dependent variable (Y) was students' learning motivation. Students' learning motivation was assessed using six indicators: perseverance, resilience in overcoming difficulties, interest in problem-solving, independence, preference for challenges, and strong determination.

The primary instrument used in this study was a learning motivation questionnaire consisting of 24 closed-ended statements measured using a three-point Likert scale: Always (3), Sometimes (2), and Never (1). For negatively worded statements, the scoring was reversed. The questionnaire was developed based on six indicators of learning motivation adapted from Aritonang (2008, as cited in Syachtiyani & Trisnawati, 2021) , namely perseverance, resilience in facing difficulties, interest in learning, independence, preference for challenges, and strong determination.

The questionnaire blueprint consisted of six indicators with four items assigned to each indicator. The perseverance indicator (Items 1–4) measured students' persistence in completing learning tasks. The resilience indicator (Items 5–8) assessed students' ability to cope with learning difficulties without giving up. The interest in learning indicator (Items 9–12) measured students' enthusiasm and curiosity toward learning activities. The independence indicator (Items 13–16) evaluated students' ability to complete tasks independently. The preference for challenges indicator (Items 17–20) measured students' willingness to undertake challenging tasks. Finally, the strong determination indicator (Items 21–24) assessed students' confidence in their own answers and decisions. Examples of questionnaire statements included "I continue working on assignments even when they are difficult" (perseverance), "I do not easily give up when I encounter difficulties in learning" (resilience), and "I can complete learning tasks independently" (independence). These indicators were designed to comprehensively measure students' learning motivation in the context of IPAS learning. The detailed blueprint of the learning motivation questionnaire, including the indicators, observed aspects, item numbers, and number of items, is presented in Table 1.

Table 1. Learning Motivation Questionnaire Blueprint

Indicator	Observed Aspect	Item Numbers	Number of Items
Perseverance	Students' persistence in completing learning tasks	1-4	4
Resilience	Students' ability to cope with learning difficulties without giving up	5-8	4
Interest in Learning	Students' enthusiasm and curiosity toward learning activities	9-12	4

Indicator	Observed Aspect	Item Numbers	Number of Items
Independence	Students' ability to complete learning tasks independently	13-16	4
Preference for Challenges	Students' willingness to undertake challenging learning tasks	17-20	4
Strong Determination	Students' confidence in their own answers and decisions	21-24	4
Total		1-24	24

To ensure the quality of the instrument, validity and reliability tests were conducted prior to data collection. The validity test was performed using Pearson Product-Moment correlation analysis with a significance level of 0.05. The results showed that 23 out of 24 items were valid, with correlation coefficients ranging from 0.401 to 0.692, exceeding the critical r-table value of 0.334. One item (P8) was excluded because its correlation coefficient (r = 0.257) was lower than the r-table value and its significance value (0.136) exceeded 0.05. Consequently, the final questionnaire used in this study consisted of 23 valid items.

The reliability of the instrument was assessed using Cronbach's Alpha. The analysis produced a Cronbach's Alpha coefficient of 0.896 for the 23 valid items, indicating a high level of internal consistency. Since the coefficient exceeded the minimum acceptable threshold of 0.70, the questionnaire was considered highly reliable and suitable for measuring students' learning motivation. These findings indicate that the instrument possessed satisfactory validity and reliability for use in this study (Isnaini et al., 2025).

The study was conducted in three stages: preparation, implementation, and data analysis. During the preparation stage, the researcher conducted preliminary observations, developed the research instruments, and performed validity and reliability tests. During the implementation stage, both the experimental and control groups were administered a pre-test to assess their initial levels of learning motivation. The experimental group then received instruction using the Problem-Based Learning (PBL) model through contextual energy-related problems, simple experiments, and concrete learning media, whereas the control group was taught using the conventional lecture method. Following the treatment period, both groups were administered a post-test to measure changes in students' learning motivation. In the final stage, the collected data were processed and analyzed using SPSS software to test the research hypothesis.

Prior to hypothesis testing, prerequisite analyses were conducted, including tests of normality and homogeneity. The normality assumption was assessed using the Shapiro–Wilk test because each group consisted of fewer than 50 participants. The results indicated that the pre-test scores of the experimental group were not normally distributed ($p = .013$). In contrast, the post-test scores of the experimental group ($p = .329$), the pre-test scores of the control group ($p = .617$), and the post-test scores of the control group ($p = .472$) were normally distributed, as all p-values exceeded .05. Homogeneity of variance was assessed using Levene's test, which indicated that the post-test variances of the experimental and control groups were homogeneous, $F(1, 49) = 0.068$, $p = .796$. Although the pre-test scores of the experimental group did not satisfy the normality assumption, the primary objective of this study was to examine differences in post-test learning motivation between the experimental and control groups. Since the post-test scores in both groups met the assumptions of normality and homogeneity, the Independent Samples t-test was considered appropriate for hypothesis testing.

The hypothesis was tested using an Independent Samples t-test at a significance level of $\alpha = 0.05$. The results revealed a statistically significant difference in learning motivation between the experimental and control groups, $t(49) = 30.503$, $p < .001$. The mean difference between the two groups was 23.97 points, with a 95% confidence interval ranging from 22.39 to 25.55. Furthermore, the effect

size analysis yielded a Cohen's d value of 8.544, indicating an exceptionally large effect. This exceptionally large effect reflects the substantial difference in learning motivation between the experimental and control groups relative to the small pooled standard deviation. These findings provide strong evidence that the implementation of the Problem-Based Learning (PBL) model had a substantial positive impact on students' learning motivation compared with the conventional lecture method (Usmadi, 2020; Putri et al., 2023).

RESULTS AND DISCUSSION

Results

This chapter presents the findings of the study concerning the effect of the Problem-Based Learning (PBL) model on the learning motivation of third-grade students in Science and Social Studies (IPAS) at SD Inpres 8 Mamboro. The research findings are presented through descriptive and inferential statistical analyses and are followed by a discussion based on the stages of the PBL model implemented throughout the learning process.

Descriptive analysis

The study was conducted at SD Inpres 8 Mamboro and involved two groups of third-grade students. Class III A served as the experimental group and received instruction through the Problem-Based Learning (PBL) model, whereas Class III B served as the control group and was taught using the conventional lecture method. Data on students' learning motivation were collected using a questionnaire consisting of 23 items, which was administered before the intervention (pre-test) and after the intervention (post-test). The results of the descriptive analysis of students' learning motivation are presented in Table 2.

Table 2. Descriptive Statistics of Students' Learning Motivation

Class	N	Mean	Standard Deviation
Experimental Group	26	61.73	2.71
Control Group	25	37.76	2.91

As shown in Table 2, the post-test mean score of the experimental group (M = 61.73, SD = 2.71) was substantially higher than that of the control group (M = 37.76, SD = 2.91). This difference indicates that students who received instruction through the Problem-Based Learning (PBL) model demonstrated higher learning motivation than those who were taught using the conventional lecture method. To provide a visual comparison of the post-test learning motivation scores between the experimental and control groups, the results are presented in Figure 1.

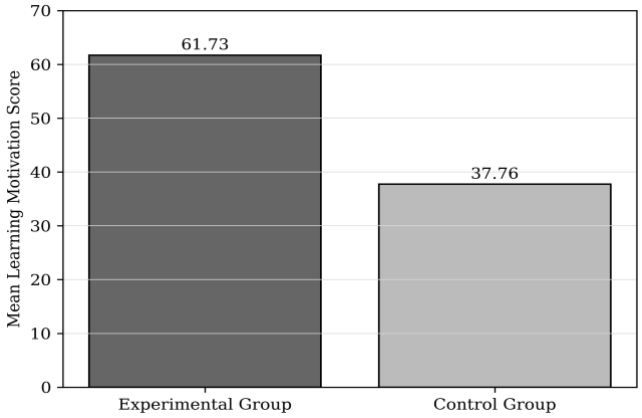

Fig.1. Comparison of post-test mean learning motivation scores

Figure 1 presents a comparison of the post-test mean learning motivation scores between the experimental and control groups. The experimental group achieved a substantially higher mean score than the control group following the implementation of the Problem-Based Learning (PBL) model. To further illustrate the variability of the post-test scores, the mean learning motivation scores along with their standard errors for both groups are presented in Figure 2.

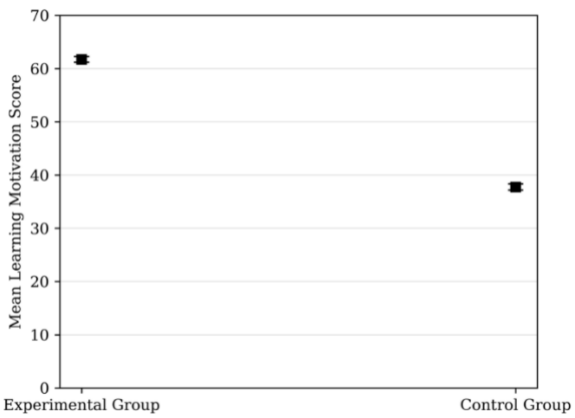

Fig.2. Post-test mean learning motivation scores with standard error

Figure 2 illustrates the mean post-test for both groups. The figure indicates that the experimental group consistently outperformed the control group, providing additional visual evidence of the positive effect of the PBL model on students' learning motivation.

Inferential analysis

Normality test

A normality test was conducted to determine whether the learning motivation data from both groups were normally distributed. The normality assumption was assessed using the Shapiro–Wilk test in SPSS version 31 because the sample size in each group was fewer than 50 participants. The results indicated that the post-test scores of the experimental group had a significance value of .329, while the post-test scores of the control group had a significance value of .472. Since both p-values were greater than .05, the post-test data for both groups were considered normally distributed.

For the pre-test data, the control group obtained a significance value of .617, indicating a normal distribution. However, the experimental group obtained a significance value of .013, which was lower than .05, indicating that the pre-test data of the experimental group were not normally distributed. Despite this finding, the hypothesis testing in this study focused on comparing the post-test scores of the experimental and control groups. Therefore, because the post-test data met the assumption of normality, the analysis was continued using parametric statistical procedures.

Homogeneity test

A homogeneity test was conducted to determine whether the variances of the two groups were equal. The homogeneity assumption was assessed using Levene's Test in SPSS version 31. The results of the homogeneity test are presented in Table 3.

Table 3. Results of The Homogeneity Test for Experimental and Control *Post-tests*

		Levene's Test for	
		F	Sig.
Post-test Experiment and Control	Equal Variances Assumed	0.068	0.796

As shown in Table 3, the significance value obtained from Levene's Test was .796, which exceeded the significance level of .05. Therefore, it can be concluded that the post-test variances of the experimental and control groups were homogeneous. This result indicates that the assumption of homogeneity of variance was satisfied.

Hypothesis testing

The research hypothesis was tested using the Independent Samples t-test. The results of the analysis are presented in Table 4.

Table 4. Results of The Independent Sample t-test

Variables	t-value	df	Sig. (2-tailed)	Mean Difference
Post-test Experiment vs Control	30,503	49	< .001	23.97

The Independent Samples t-test revealed a statistically significant difference between the experimental and control groups, $t(49) = 30.503$, $p < .001$. The mean difference between the two groups was 23.97 points. Since the p-value was less than .05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted. These results indicate that the Problem-Based Learning (PBL) model significantly improved students' learning motivation compared with the conventional lecture method.

Furthermore, effect size analysis using Cohen's d yielded a value of 8.544, indicating an exceptionally large effect. The value was recalculated using the pooled standard deviation and confirmed by SPSS Version 31. This exceptionally large effect reflects the substantial difference in learning motivation between the experimental and control groups relative to the small pooled standard deviation. These findings provide strong evidence that the implementation of the Problem-Based Learning (PBL) model had a substantial positive impact on students' learning motivation.

Discussion

The findings of this study indicate that the implementation of the Problem-Based Learning (PBL) model had a significant positive effect on the learning motivation of third-grade students in IPAS at SD Inpres 8 Mamboro. Students who participated in PBL-based instruction demonstrated substantially higher levels of learning motivation than those who were taught using the conventional lecture method. This conclusion is supported by the significant increase in students' learning motivation scores from the pre-test to the post-test in the experimental group, as well as the statistically significant difference between the experimental and control groups. More importantly, the findings suggest that Problem-Based Learning (PBL) fosters higher levels of learning motivation while creating learning conditions that encourage students to participate actively and meaningfully in the learning process.

One possible explanation for this improvement lies in the student-centered nature of the PBL model. Unlike conventional instruction, which often positions students as passive recipients of information, PBL actively involves students in identifying problems, discussing possible solutions, conducting investigations, and presenting their findings. Through these activities, students become more responsible for their own learning and experience greater involvement in the learning process. As a result, students are more likely to develop curiosity, persistence, and interest in learning activities.

From a motivational perspective, the findings suggest that the Problem-Based Learning (PBL) model creates learning experiences that encourage students to participate more actively in the learning process. During the implementation of PBL, students were given opportunities to explore ideas, discuss problems, collaborate with peers, and develop solutions to contextual issues. These activities enabled students to become more involved in learning and fostered a sense of responsibility for their own learning. Furthermore, collaborative group work encouraged students to interact, exchange ideas, and support one another, thereby creating a more engaging and meaningful learning environment.

The increase in learning motivation observed in this study may be associated with students'

greater engagement, curiosity, and sense of responsibility during the learning process. Rather than participating in learning activities merely to complete assignments, students in the PBL classroom were encouraged to explore problems, generate ideas, and construct knowledge collaboratively. These experiences helped students become more actively involved in learning and increased their interest in the topics being studied. As a result, students demonstrated greater enthusiasm, persistence, and willingness to participate in classroom activities.

The increase in learning motivation was also reflected in several motivational indicators measured in this study, including commitment to learning tasks, persistence in facing difficulties, interest in solving problems, learning independence, enjoyment of challenging activities, and confidence in expressing opinions. These improvements suggest that PBL encourages students to view learning as an active and meaningful process rather than merely a requirement to complete academic tasks. Such findings support previous studies reporting that problem-solving and inquiry-based activities can stimulate students' curiosity, engagement, and willingness to learn (Mustaghfirin, 2022; Safitri & Hadi, 2023).

The effectiveness of the Problem-Based Learning (PBL) model may be attributed to its compatibility with the characteristics of IPAS education. IPAS learning encourages students to observe phenomena, ask questions, investigate information, analyze evidence, and construct explanations related to both natural and social contexts. The PBL model provides opportunities for students to engage in inquiry and problem-solving activities through contextual issues that are closely connected to their daily lives. In this study, students explored energy-related problems through simple experiments and concrete learning media, enabling them to connect classroom concepts with real-life situations. These meaningful learning experiences likely contributed to the substantial improvement in students' learning motivation. This finding supports the view that context-based and inquiry-oriented learning enhances students' motivation and active participation in IPAS (Indriyani et al., 2025).

A critical interpretation of these findings helps explain the substantial improvement observed in the experimental group. One contributing factor is that students initially demonstrated relatively low levels of learning motivation, leaving considerable room for improvement following the intervention. In addition, the clear contrast between the inquiry-oriented PBL approach and the teacher-centered instruction experienced by the control group likely amplified the impact of the treatment. The intervention was further supported by contextual learning activities that aligned with the developmental characteristics of third-grade elementary school students, enabling them to engage actively with authentic problems and construct knowledge through meaningful experiences. Collectively, these conditions provide a plausible explanation for the magnitude of improvement observed after the implementation of PBL.

In contrast, students in the control group experienced conventional lecture-based instruction, where learning activities were primarily teacher-centered. Although this approach may facilitate efficient content delivery, it offers fewer opportunities for students to participate actively, collaborate with peers, or explore ideas independently. As a result, students may become less engaged in the learning process, which can limit the development of learning motivation. This finding is consistent with previous research suggesting that teacher-centered instruction often provides limited opportunities for students to develop autonomy and active participation in learning (Hasibuan, 2025).

These findings also have important implications for contemporary motivation theory. Recent evidence based on Self-Determination Theory suggests that students' motivation is strengthened when learning environments support their needs for autonomy, competence, and relatedness (Howard et al., 2021; Guay, 2022). In the present study, Problem-Based Learning promoted students' autonomy by allowing them to explore ideas and make decisions independently, enhanced their competence through successful problem-solving experiences, and fostered relatedness through collaborative group work. Furthermore, recent evidence from Expectancy-Value Theory indicates that students are more motivated when learning tasks are perceived as meaningful, relevant, and valuable to their daily lives (Shang et al., 2023). The contextual problems, simple experiments, and concrete learning media implemented in this study likely increased the perceived value of learning, encouraging students to invest greater effort, persist in completing learning tasks, and participate more actively throughout the

learning process. Together, these theoretical perspectives provide a plausible explanation for why students who experienced Problem-Based Learning demonstrated substantially higher levels of learning motivation than those who received conventional lecture-based instruction.

Beyond its local context, this study contributes to the broader field of IPAS education by providing empirical evidence that the PBL model can effectively enhance learning motivation among elementary school students. Unlike previous studies that primarily examined academic achievement, the present study specifically focuses on students' learning motivation as the primary outcome variable. These findings are particularly relevant to contemporary IPAS education, which increasingly emphasizes inquiry, problem solving, collaboration, and student agency as essential competencies for the twenty-first century. The results suggest that motivational outcomes should be considered alongside cognitive outcomes when evaluating the effectiveness of instructional approaches in IPAS classrooms.

Overall, the results of this study reinforce the growing body of evidence that Problem-Based Learning is not merely an instructional model for enhancing students' learning motivation but also a pedagogical approach capable of strengthening students' motivational foundations for learning. By encouraging active participation, collaboration, inquiry, and engagement with meaningful problems, PBL creates learning experiences that motivate students to participate more actively and enthusiastically in IPAS learning.

CONCLUSION AND SUGGESTIONS

The findings of this study indicate that the Problem-Based Learning (PBL) model has a positive effect on the learning motivation of third-grade students in Science and Social Studies (IPAS) at SD Inpres 8 Mamboro. Compared with the conventional lecture method, PBL encourages students to participate more actively in learning activities, collaborate with their peers, and engage in problem-solving processes. Through these student-centered learning experiences, the model helps increase students' interest, engagement, and responsibility in learning.

The findings suggest that PBL can serve as an effective instructional approach for enhancing learning motivation in elementary Science and Social Studies (IPAS) education. By providing meaningful, contextual, and problem-oriented learning experiences, PBL supports students' active involvement in the learning process and contributes to the creation of a more interactive and engaging learning environment.

This study was limited to one elementary school and involved only third-grade students; therefore, the generalization of the findings should be made with caution. In addition, the study focused solely on students' learning motivation in Science and Social Studies (IPAS). Future research is recommended to involve larger and more diverse samples, implement longer intervention periods, and examine additional variables such as academic achievement, critical thinking skills, and problem-solving abilities in order to provide a more comprehensive understanding of the effectiveness of the Problem-Based Learning (PBL) model in IPAS education.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this article. The research was conducted independently without any commercial, financial, or personal relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS STATEMENT

Conceptualization, N.Z.-Z. and S.N.K.; methodology, N.Z.-Z., S.N.K., and Pa.P.; validation, N.Z.-Z. and Pa.P.; formal analysis, N.Z.-Z. and A.A.; investigation, N.Z.-Z., S.N.K., Pa.P., A.A., and Pu.P.;

data curation, N.Z.-Z. and A.A.; writing—original draft preparation, N.Z.-Z.; writing—review and editing, S.N.K., Pa.P., A.A., and Pu.P.; visualization, N.Z.-Z.; supervision, S.N.K.; project administration, N.Z.-Z. All authors have read and agreed to the published version of the manuscript.

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GENERATIVE AI SOURCE DECLARATION

The authors declare that no generative artificial intelligence (AI) tools or AI-assisted technologies were used in the preparation, writing, or revision of this manuscript.

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