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The Effect of the Problem-Based Learning Model on Students' Critical Thinking Skills in IPAS Learning at SDN Lasoani

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A B S T R A C T

This study aimed to determine the effect of the Problem-Based Learning model on the critical thinking skills of fourth grade students in IPAS learning at SDN Lasoani. The study employed a quantitative approach using a pre-experimental method with a one-group pretest and posttest design. The sample consisted of 26 fourth grade students selected through purposive sampling. Data were collected using essay tests developed based on Ennis's critical thinking indicators and analyzed using descriptive statistics and the Wilcoxon Signed-Rank Test. The results showed that the mean score increased from 61.15 on the pretest to 82.31 on the posttest. Improvements were observed across all critical thinking indicators, with the highest increase found in the drawing conclusions indicator. The Wilcoxon Signed-Rank Test yielded a significance value of 0.001 ($p < 0.05$), indicating a significant difference between pretest and posttest scores. These findings demonstrate that the Problem-Based Learning model effectively improves students' critical thinking skills through contextual problem-solving, investigation, discussion, and reflection activities. Therefore, PBL can be considered an effective instructional approach for enhancing critical thinking skills in IPAS learning within the context of the Merdeka Curriculum.

1. Introduction

Education is considered a fundamental aspect of human life; therefore, every Indonesian citizen has the right to receive education and expects its quality to continuously improve. According to the National Education System Law (SISDIKNAS) No. 20 of 2003, education is defined as a planned and systematic effort to create learning environments and learning processes that enable students to actively develop their potential. These potentials include emotional and spiritual intelligence, talents, character, and creativity, which are essential for becoming responsible citizens (Isky et al., 2025; Ristanti et al., 2020).

(Rahmawati & Gufron, 2024) argue that high-quality education must be grounded in a well-designed curriculum. Similarly, (Hakim et al., 2023) states that the curriculum is a key component of the learning process at all educational levels. The Indonesian education system has undergone several curriculum reforms, with the latest innovation introduced by the Ministry of Education, Culture, Research, and Technology being the Merdeka Curriculum. Initially implemented in selected pilot schools, the Merdeka Curriculum has gradually been expanded to various educational levels, depending on the readiness and conditions of individual schools (Firli Fangestu et al., 2025; Kurniati et al., 2022).

One distinctive feature of the Merdeka Curriculum is the integration of Natural Sciences (IPA) and Social Sciences (IPS) into a single subject known as Natural and Social Sciences (IPAS) at the elementary school level. This integration is based on the consideration that elementary school students tend to perceive and understand phenomena holistically. At this developmental stage, their thinking patterns are generally concrete, simple, holistic, and comparative, although they have not yet developed the capacity for highly detailed and abstract reasoning (Anisah et al., 2023).

Effective IPAS learning should provide students with direct learning experiences, as practical experiences tend to be more meaningful and memorable. Considering the characteristics of IPAS, teachers need to carefully select instructional models that actively engage students in the learning process. Learning models that involve students directly in various activities can positively influence their participation and interest in learning the subject matter (Arifatul Adawiyah et al., 2025). IPAS plays a significant role in fostering students' curiosity about natural and social phenomena in their surroundings. Through IPAS learning, students are encouraged not only to acquire theoretical knowledge but also to explore, verify, and construct concepts independently (Hakim et al., 2023).

This process is carried out through hands-on activities, simple investigations, observations of learning objects, and the utilization of the surrounding environment as a learning resource. Such an approach allows students to gain more meaningful learning experiences (Ardiana & Lapasere, 2025; Rumanti & Christy, 2026). Furthermore, engaging and well-designed learning activities help students achieve learning objectives comprehensively across cognitive, affective, and psychomotor domains (Herlinda et al., 2026; Mustikazahra et al., 2025). The primary objective of IPAS learning is to develop students' skills in questioning, investigating, and discovering answers to various issues related to natural and social life. In addition, IPAS learning contributes to students' understanding of themselves and their environment while developing scientific knowledge and concepts that serve as the foundation for critical thinking (Andini et al., 2025; Mustikazahra et al., 2025).

Critical thinking is an active cognitive process aimed at analyzing, evaluating, and solving problems systematically, carefully, and accurately. This skill includes the ability to identify, examine, and interpret information, which can then be used as a basis for determining appropriate alternatives and problem-solving strategies

(Jannah et al., 2024; Novandi et al., 2025). Furthermore, critical thinking can be understood as an intellectual process involving conceptualization, application of knowledge, synthesis, and evaluation of information obtained from observation, experience, reflection, reasoning, or communication (Hartati et al., 2023; Istiqori et al., 2022; Winarso et al., 2023). These processes provide the foundation for individuals to form beliefs, make decisions, and take rational and responsible actions (Ainiyyah et al., 2025; Andini et al., 2025; Ardiana & Lapasere, 2025).

2. Methodology

This study employed a quantitative approach using a pre-experimental method with a one-group pretest and posttest design (Kharisma & Fironika, 2026). The design was selected to examine the effect of the Problem-Based Learning model on students' critical thinking skills in IPAS learning by comparing students' performance before and after the implementation of the treatment. The research was conducted at SDN Lasoani, Mantikulore District, Palu City, Central Sulawesi, during the second semester of the 2025/2026 academic year. The population consisted of all fourth-grade students at SDN Lasoani. Since the population was relatively small, all 26 students were selected as the research sample using purposive sampling.

The independent variable in this study was the Problem-Based Learning model, while the dependent variable was students' critical thinking skills in IPAS learning. Data were collected through tests and documentation. The test instrument consisted of essay questions designed based on critical thinking indicators proposed by Ennis, including providing simple explanations, building basic skills, drawing conclusions, providing further explanations, and determining strategies and tactics. Prior to data collection, the instrument was validated and tested for reliability. Instrument validity was examined using the pearson product moment correlation, while reliability was analyzed using Cronbach's Alpha coefficient. The results indicated that the instrument met the validity and reliability requirements and was appropriate for use in the study.

The research procedure consisted of three stages. First, students were administered a pretest to measure their initial critical thinking skills. Second, the Problem-Based Learning model was implemented in IPAS learning activities. Finally, a posttest was administered to determine changes in students' critical thinking skills after the treatment. Data were analyzed using descriptive and inferential statistics with the assistance of IBM SPSS Statistics 25. Descriptive statistics were used to summarize students' pretest and posttest scores. Before hypothesis testing, data normality was assessed using the Shapiro–Wilk test. Since the data did not meet the assumption of normality, hypothesis testing was conducted using the Wilcoxon Signed-Rank Test at a significance level of 0.05. The decision criterion was that the null hypothesis (H_0) would be rejected if the significance value was less than 0.05, indicating a significant effect of the Problem-Based Learning model on students' critical thinking skills.

Critical thinking also involves the ability to avoid accepting information unquestioningly from oral or written sources, maintain an open mind toward diverse perspectives, and critically evaluate ideas rather than simply accepting them without understanding or assessment (Anggraeni et al., 2022; Yemifaira & Gagaramusu, 2026). However, Indonesia continues to rank relatively low in terms of critical thinking skills. This condition highlights the need for innovation in instructional methods, learning processes, and educational facilities to enhance students' critical thinking abilities (Rofi'ah & Rokhmaniyah, 2024).

This issue was also identified at SDN Lasoani. Based on a preliminary observation conducted on September 16, 2025, several problems were found during the learning process. Some students experienced difficulties in understanding learning materials and maintaining concentration during lessons. In addition, students' critical thinking skills were relatively low, as evidenced by their limited participation in asking and answering questions during classroom activities. Another factor contributing to the low level of critical thinking was the lack of appropriate instructional stimulation and learning models. Teachers predominantly employed lecture-based methods, which often led to student boredom and reduced attention. Learning activities tended to focus on memorizing facts and formulas rather than understanding fundamental concepts, resulting in passive student participation. Therefore, an appropriate learning model is needed to address these challenges.

To overcome these learning problems, teachers need to implement instructional models that enable students to receive information more effectively. Appropriate learning models can help students acquire knowledge, develop ideas, improve their thinking processes, and express their opinions. Learning models also serve as guidelines for teachers in designing and implementing instructional activities. One instructional model that has gained considerable attention is Problem Based Learning. This model is considered innovative because it is centered on problem solving activities that enable students to develop, test, and continuously improve their critical thinking skills through collaborative learning experiences. Problem-Based Learning is a student-centered instructional model that encourages learners to work collaboratively, construct knowledge through experience, and connect their learning to real life problems presented by the teacher. This model utilizes authentic problems as a means of teaching students how to think critically, solve problems, and learn independently (Rofi'ah & Rokhmaniyah, 2024).

Furthermore, Problem-Based Learning facilitates students' engagement with problems before formal instruction begins and creates real-world learning situations that motivate them to explore, investigate, and develop solutions to various issues. The advantages of the Problem-Based Learning model include fostering student independence, enhancing higher-order thinking skills, increasing learning motivation, deepening conceptual understanding, and promoting collaboration and teamwork among students (Novandi et al., 2025). Based on the background described above and the problems identified in the field, the researcher conducted a study entitled "The Effect of the Problem-Based Learning model on Students' Critical Thinking Skills in IPAS Learning among Fourth-Grade Students at SDN Lasoani".

3. Results and Discussion

Prior to analyzing the effect of the Problem-Based Learning model on students' critical thinking skills, the implementation process of the learning model was first carried out during IPAS learning activities. The implementation was conducted in four instructional meetings following the main stages of the Problem-Based Learning model, namely problem orientation, organizing students for learning, guiding investigation, developing and presenting solutions, and evaluating the problem-solving process. Throughout the learning activities, students were actively involved in identifying problems, discussing alternative solutions, gathering relevant information, and presenting the results of their investigations.

Meanwhile, the teacher acted as a facilitator who guided students during the learning process. The implementation of these learning activities was designed to provide meaningful learning experiences and encourage students to develop critical thinking skills through contextual problem-solving. After the implementation of the Problem-Based Learning model was completed, data were collected and analyzed to determine its effect on students' critical thinking skills. The results of the analysis are presented in the following sections.

The learning activities focused on real-life problems related to the IPAS subject matter and students' daily experiences. Through collaborative discussions and investigations, students were encouraged to analyze information, evaluate evidence, formulate conclusions, and communicate their ideas effectively. These activities were expected to enhance students' engagement and support the development of higher-order thinking skills. Therefore, before presenting the statistical findings, it is important to describe the implementation process of the PBL model as the treatment administered in this study.

Implementation of the Problem-Based Learning Model

The implementation of the Problem-Based Learning model was carried out in four instructional meetings during IPAS learning. At the beginning of each lesson, the teacher presented contextual problems related to students' daily experiences. Students were then organized into small groups to identify problems, formulate questions, and discuss possible solutions. During the investigation stage, students collected information from textbooks, worksheets, and classroom discussions under the teacher's guidance.

Subsequently, each group presented the results of their investigation and proposed solutions to the identified problems. Finally, students and the teacher reflected on the learning process and evaluated the proposed solutions. Through these activities, students were actively engaged in analyzing information, evaluating evidence, and formulating logical conclusions, which contributed to the improvement of their critical thinking skills. For more details, please see table 1.

Table 1. Implementation of Problem-Based Learning in IPAS Learning

Meeting	PBL Stage	Teacher Activities	Student Activities
1	Problem Orientation	Presenting contextual problems about IPAS topics	Identifying and understanding the problems
2	Organizing Students	Forming groups and guiding discussions	Discussing and formulating problem-solving plans
3	Investigation	Facilitating information gathering	Collecting data and analyzing information
4	Presentation and Evaluation	Guiding presentations and reflection	Presenting solutions and drawing conclusions

During the implementation process, students were encouraged to engage actively in collaborative discussions and problem-solving activities. Through these learning experiences, students practiced analyzing information, evaluating evidence, formulating conclusions, and communicating ideas effectively. These activities were expected to improve students' critical thinking skills and support the objectives of IPAS learning within the Merdeka Curriculum.

Relationship Between Problem Based Learning Stages and Critical Thinking Indicators

The implementation of the Problem-Based Learning model was designed to facilitate the development of students' critical thinking skills through each stage of learning. During the problem orientation stage, students were encouraged to identify and explain the problems presented by the teacher. This activity supported the indicator of providing simple explanations because students were required to recognize issues and express their initial understanding. In the organizing stage, students worked collaboratively to formulate questions and gather relevant information, which contributed to the development of basic thinking skills.

During the investigation stage, students analyzed information obtained from various learning sources and discussed possible solutions to the problems. These activities trained students to evaluate evidence and consider different perspectives before making decisions. Furthermore, when presenting the results of their discussions, students were required to provide further explanations and defend their arguments using logical reasoning. Finally, in the reflection and evaluation stage, students drew conclusions from the learning process and determined appropriate strategies for solving similar problems in the future. Therefore, each stage of the Problem-Based Learning model contributed directly to the development of the critical thinking indicators measured in this study.

To facilitate the implementation of the Problem-Based Learning model, students were provided with contextual problems closely related to their daily lives and learning experiences. The use of authentic problems was intended to encourage students to identify issues, analyze causes and consequences, evaluate available information, and formulate appropriate solutions collaboratively. Through these activities, students were expected to develop critical thinking skills, particularly in providing explanations, analyzing evidence, drawing conclusions, and determining effective problem-solving strategies. The following examples illustrate the types of

problems presented to students during the implementation of the PBL model in IPAS learning. Examples of problems used in Problem-Based Learning activities are:

1. Problem 1: Waste Management Around the School
   Students were presented with a problem regarding the accumulation of plastic waste in the school environment. They were asked to identify the causes of the problem, analyze its impact on environmental health, and propose practical solutions that could be implemented by the school community. Through this activity, students learned to analyze environmental issues and develop evidence-based solutions.
2. Problem 2: Water Conservation in Daily Life
   Students were asked to investigate the issue of excessive water usage at home and school. They discussed the causes and consequences of water wastage and proposed strategies to conserve water resources. This problem encouraged students to evaluate information, formulate conclusions, and determine appropriate actions to address environmental challenges.

Instrument Validity and Reliability Testing

Before being administered to the research participants, the essay test instrument measuring students' critical thinking skills was first tested for validity and reliability. The validity test was conducted using the pearson product moment correlation technique. The analysis showed that all test items had correlation coefficients higher than the critical value of r-table (0.388), indicating that all items were valid and suitable for data collection. Furthermore, reliability testing was carried out using Cronbach's Alpha. The result obtained a Cronbach's Alpha coefficient of 0.842, which is higher than the minimum criterion of 0.70. Therefore, the instrument was categorized as reliable and consistent for measuring students' critical thinking skills.

Descriptive Statistics of Pretest and Posttest Scores

Descriptive statistics of students' critical thinking abilities before and after the implementation of the Problem-Based Learning model are presented in table 2.

Table 2. Descriptive Statistics of Pretest and Posttest Scores

Statistic	Pretest	Posttest
N	26	26
Minimum	45	65
Maximum	78	95
Mean	61.15	82.31
Standard Deviation	8.27	7.14

Table 2 presents the descriptive statistics of students' critical thinking skills before and after the implementation of the Problem Based Learning model. The results indicate a notable improvement in students' performance following the treatment. Prior to the implementation of Problem-Based Learning model, the mean pretest score was 61.15, indicating that students' critical thinking skills were still relatively

low. After participating in learning activities using the Problem-Based Learning model, the mean posttest score increased to 82.31. This represents an increase of 21.16 points, suggesting that students experienced substantial improvement in their critical thinking abilities.

The minimum score also increased significantly from 45 on the pretest to 65 on the posttest. This finding suggests that students who initially demonstrated lower levels of critical thinking skills were able to achieve better learning outcomes after the implementation of the Problem-Based Learning model. Similarly, the maximum score increased from 78 to 95, indicating that higher-achieving students also benefited from the learning intervention and were able to further develop their critical thinking abilities. In addition, the standard deviation decreased from 8.27 in the pretest to 7.14 in the posttest. This reduction suggests that students' scores became more homogeneous after the implementation of the Problem-Based Learning model. In other words, the gap between high-performing and low-performing students was reduced, indicating that the learning model contributed to more equitable learning outcomes across the class.

The improvement in students' scores can be attributed to the characteristics of the Problem-Based Learning model, which actively engages learners in identifying, analyzing, and solving real-world problems. Throughout the learning process, students were encouraged to participate in discussions, express opinions, evaluate information, and formulate solutions collaboratively. These activities provided meaningful learning experiences that stimulated higher-order thinking processes and enabled students to develop critical thinking skills more effectively.

Furthermore, classroom observations during the implementation of the Problem-Based Learning model revealed increased student engagement and participation. Students appeared more enthusiastic in responding to problems presented by the teacher, asking questions, and sharing ideas with their peers. The contextual problems used in the learning activities encouraged students to connect theoretical concepts with real-life situations, thereby enhancing their understanding of the subject matter and strengthening their reasoning abilities.

Overall, the descriptive statistics demonstrate a positive trend in students' critical thinking skills following the implementation of the Problem-Based Learning model. The increase in mean, minimum, and maximum scores, along with the decrease in score variability, provides preliminary evidence that Problem-Based Learning contributed positively to the development of students' critical thinking abilities in IPAS learning. These findings were further examined through inferential statistical analysis to determine whether the observed improvements were statistically significant. To provide a clearer description of students' improvement, the increase in mean scores and percentage of improvement were calculated and are presented in table 3.

Table 3. Improvement in Each Critical Thinking Indicator

Critical Thinking Indicator	Pretest	Posttest	Increase
Providing Simple Explanations	62.50	85.00	22.50
Building Basic Skills	58.00	80.00	22.00
Drawing Conclusions	60.00	84.00	24.00
Providing Further Explanations	61.00	81.00	20.00
Determining Strategies and Tactics	64.00	82.50	18.50

Table 3 shows that all indicators of critical thinking improved after the implementation of the Problem-Based Learning model. The greatest improvement was found in the indicator of drawing conclusions, which increased by 24.00 points. This suggests that students became more capable of interpreting information and formulating logical conclusions after participating in problem-solving activities. Meanwhile, the smallest improvement was observed in determining strategies and tactics, although the indicator still demonstrated positive growth.

Normality Test

Before conducting hypothesis testing, it was necessary to examine whether the data met the assumption of normal distribution. Testing for normality is an important prerequisite in statistical analysis because it determines the appropriate statistical procedure to be used for hypothesis testing. In this study, the normality of the pretest and posttest scores was assessed using the Shapiro–Wilk test, which is recommended for small sample sizes ($N < 50$). The results of the normality test are presented in table 4.

Table 4. Shapiro–Wilk Normality Test Results

Variable	Statistic	Sig.
Pretest	0.892	0.011
Posttest	0.876	0.006

As shown in table 4, the Shapiro–Wilk test produced a significance value of 0.011 for the pretest scores and 0.006 for the posttest scores. According to the decision criteria of the normality test, data are considered normally distributed when the significance value exceeds 0.05. Conversely, if the significance value is less than 0.05, the data are regarded as non-normally distributed. The results indicate that both the pretest and posttest significance values were below the 0.05 threshold. Specifically, the pretest score yielded a significance value of 0.011, while the posttest score yielded a significance value of 0.006. These findings suggest that the distribution of students' critical thinking scores before and after the implementation of the Problem-Based Learning model deviated from a normal distribution. Therefore, the assumption of normality required for parametric statistical tests was not satisfied.

The non-normal distribution of the data may have been influenced by several factors, including the relatively small sample size and the variation in students' learning abilities. Additionally, the substantial improvement in students' scores following the implementation of the Problem-Based Learning model may have

caused the score distribution to become skewed, resulting in the violation of the normality assumption. Because the data did not meet the requirement of normal distribution, parametric tests such as the paired-samples t-test could not be applied. Consequently, a non-parametric statistical procedure was selected to analyze the difference between pretest and posttest scores. The Wilcoxon Signed-Rank Test was employed because it is specifically designed to compare two related samples when the normality assumption is violated. This test provides a robust alternative for determining whether there is a statistically significant difference between students' critical thinking skills before and after the implementation of the Problem-Based Learning model. Based on these results, it can be concluded that the pretest and posttest data were not normally distributed. Therefore, further hypothesis testing was conducted using the Wilcoxon Signed-Rank Test to examine the effectiveness of the Problem-Based Learning model in improving students' critical thinking skills in IPAS learning.

Wilcoxon Signed-Rank Test

After the normality test indicated that the pretest and posttest data were not normally distributed, hypothesis testing was conducted using the Wilcoxon Signed-Rank Test. This non-parametric statistical test was selected because it is appropriate for analyzing paired data that do not meet the assumption of normality. The test was employed to determine whether there was a statistically significant difference between students' critical thinking skills before and after the implementation of the Problem Based Learning model in IPAS learning. The results of the analysis are presented in table 5.

Table 5. Wilcoxon Signed-Rank Test Results

Test	N	Asymp. Sig. (2-tailed)
Wilcoxon Signed-Rank Test	26	0.001

As shown in table 5, the Wilcoxon Signed-Rank Test produced an Asymp Sig. (2-tailed) value of 0.001. The significance value obtained was considerably lower than the predetermined alpha level of 0.05. According to the decision criteria, the null hypothesis (H_0) is rejected when the significance value is less than 0.05, while the alternative hypothesis (H_1) is accepted. Therefore, the results indicate that there was a statistically significant difference between students' pretest and posttest scores. The rejection of the null hypothesis demonstrates that the implementation of the Problem-Based Learning model significantly influenced students' critical thinking skills. This finding suggests that the improvement observed in the posttest scores was not due to chance but was associated with the learning treatment provided during the study. The statistical evidence confirms that students experienced meaningful development in their ability to analyze information, identify problems, evaluate evidence, formulate logical conclusions, and propose appropriate solutions after participating in Problem-Based Learning activities.

The significant increase in students' critical thinking skills can be attributed to the characteristics of the Problem-Based Learning model, which emphasizes active student participation and problem-solving processes. Throughout the learning

activities, students were presented with contextual problems related to the IPAS subject matter and were encouraged to investigate, discuss, and develop solutions collaboratively. Such learning experiences required students to engage in higher order thinking processes, including analysis, evaluation, and reasoning, which are essential components of critical thinking. Furthermore, the Problem-Based Learning model provided opportunities for students to construct their own understanding through inquiry and exploration rather than relying solely on information delivered by the teacher. During classroom activities, students actively exchanged ideas, questioned assumptions, evaluated alternative solutions, and justified their opinions using evidence. These activities contributed to the development of their critical thinking abilities and enhanced their confidence in expressing their thoughts and arguments.

The findings of this study are also supported by the descriptive statistics, which showed an increase in the average score from 61.15 on the pretest to 82.31 on the posttest. This substantial improvement, combined with the significant Wilcoxon test result, provides strong evidence that the Problem Based Learning model was effective in enhancing students' critical thinking skills. In addition, the improvement in minimum and maximum scores indicates that the positive impact of the intervention was experienced by students across different achievement levels. Overall, the results of the Wilcoxon Signed-Rank Test confirm that the Problem-Based Learning model had a significant positive effect on the critical thinking skills of fourth-grade students in IPAS learning at SDN Lasoani. These findings support the use of Problem-Based Learning model as an effective instructional approach for promoting higher-order thinking skills and achieving the objectives of the Merdeka Curriculum, which emphasizes active, meaningful, and student centered learning.

Discussion

The findings of this study indicate that the implementation of the Problem-Based Learning model significantly improved students' critical thinking skills in IPAS learning. This result is evidenced by the increase in the mean score from 61.15 in the pretest to 82.31 in the posttest, as well as the Wilcoxon test result showing a significance value of 0.001 (< 0.05). These findings demonstrate that students experienced substantial improvement in their ability to analyze problems, evaluate information, draw conclusions, and formulate appropriate solutions after participating in Problem Based Learning activities. The improvement in students' critical thinking skills can be attributed to the characteristics of the Problem Based Learning model, which actively engages learners in solving authentic problems related to their daily lives. During the learning process, students were encouraged to identify problems, discuss alternative solutions, collect relevant information, and present the results of their investigations. Such activities provided students with opportunities to develop higher-order thinking skills rather than merely memorizing concepts. Through collaborative discussions and problem-solving tasks, students became more confident in expressing opinions and defending their arguments with logical reasoning.

Furthermore, the Problem-Based Learning model promotes student centered learning, where learners actively construct their own understanding through exploration and investigation. This learning environment differs from conventional teacher centered approaches that often limit students' opportunities to think critically. In this study, students demonstrated greater enthusiasm and participation during classroom activities. They were more willing to ask questions, respond to problems, and work collaboratively with peers to find solutions. These learning experiences contributed positively to the development of critical thinking skills. The findings of this study are consistent with previous studies that reported positive effects of Problem-Based Learning on students' critical thinking abilities. Problem-Based Learning model creates meaningful learning experiences by connecting subject matter with real-life situations, thereby encouraging students to engage in analytical and reflective thinking. The model also supports the objectives of the Merdeka Curriculum, which emphasizes the development of students' competencies, creativity, independence, and problem-solving skills.

In the context of IPAS learning, the Problem-Based Learning model is particularly relevant because the subject requires students to understand natural and social phenomena through inquiry and investigation. By confronting students with contextual problems, Problem-Based Learning model helps them develop a deeper understanding of concepts while simultaneously enhancing their reasoning abilities. Consequently, students become more capable of interpreting information, evaluating evidence, and making informed decisions. Overall, the results of this study confirm that the Problem-Based Learning model is an effective instructional strategy for improving elementary school students' critical thinking skills in IPAS learning. Therefore, teachers are encouraged to implement Problem-Based Learning more frequently in classroom instruction to create active, meaningful, and intellectually stimulating learning experiences.

4. Conclusion

This study concludes that the implementation of the Problem-Based Learning model has a positive effect on the critical thinking skills of Fourth-Grade students in IPAS learning at SDN Lasoani. The research findings indicate that students demonstrated better abilities in identifying problems, analyzing information, evaluating evidence, drawing logical conclusions, and determining appropriate problem-solving strategies after participating in Problem-Based Learning activities. The success of this study can be attributed to the characteristics of the Problem-Based Learning model, which encourages students to actively engage in contextual problem-solving, collaborative discussions, investigation, and reflective learning. These learning experiences enabled students to construct knowledge independently while developing higher-order thinking skills in meaningful learning situations. The findings also support the implementation of student-centered learning as promoted by the Merdeka Curriculum, particularly in fostering critical thinking through authentic learning experiences. Therefore, the Problem Based Learning model can be considered an effective instructional approach for improving students' critical thinking skills in IPAS learning at the elementary school level. Nevertheless, since

this study employed a pre-experimental design involving a single group, further research using more rigorous experimental designs and larger samples is recommended to strengthen the generalizability of the findings.

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