The Use of Project-Based Learning Model in Improving Learning Outcomes in IPAS Learning

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Abstract: This research is motivated by the lack of enjoyable learning models that enhance students' critical thinking and problem-solving skills as an effort to improve learning outcomes in IPAS for fourth-grade students. The solution to this issue is the implementation of the Problem-Based Learning model. This study aims to determine the effect of using the Problem-Based Learning model on the learning outcomes of fourth-grade students at SD Negeri Lubuk Harjo. This research is a Classroom Action Research (CAR) study. Based on the analysis of evaluation test scores, there was an improvement in students' cognitive learning outcomes. The collected data were analyzed using descriptive statistical analysis, and the results showed that in the first cycle, the percentage of students who achieved mastery learning was 79.47%, which increased to 91.58% in the second cycle. Thus, it can be concluded that the use of the Problem-Based Learning model in Natural and Social Sciences learning can improve students' learning outcomes.

Keywords: IPAS; Learning outcomes; Problem-based learning

Introduction

The Ministry of Education, Culture, Research, and Technology (2021) states that the integration of Natural Sciences (IPA) and Social Sciences (IPS) in the Merdeka Belajar Curriculum aims to develop a more holistic, multidisciplinary, and contextual education. In this integration, these two subjects are not only studied separately but are also interconnected so that students can understand the relationship between scientific and social aspects in everyday life. The integration of IPA and IPS in the Merdeka Belajar Curriculum has also received support from various parties, including education experts and the public. They believe that a holistic and interdisciplinary approach can provide greater benefits for students' overall development (Astuti et al., 2024; Berasategi et al., 2020; Rafiq et al., 2024). Therefore, teachers, as the key factor in students' success, must strive to make Natural and Social Sciences (IPAS) learning more engaging and active to achieve its intended learning objectives (Hardiansyah et al., 2022; Permatasari et al., 2019; Wanti et al., 2023).

However, in practice, IPAS is often considered a boring subject by some students. Several challenges arise in teaching IPAS, particularly due to teachers' limited knowledge, which results in IPAS not being taught in an integrated manner. Additionally, there is a lack of innovation in teaching methods, leading to low student interest in IPAS (Kombel KKG Region 1 and 2, Bayung Lencir District). This issue is also observed in fourth-grade students at SDN Lubuk Harjo, Bayung Lencir District, MUBA, South Sumatra. Based on teacher field notes from January 2024 on IPAS lessons, the following findings were recorded: 1) only four students dared to answer questions, 2) most students remained passive during lessons, 3) only six students achieved mastery learning, 4) only two students actively asked questions. IPAS lessons are still predominantly delivered through lecture-based methods and assignments. Therefore, IPAS learning needs to be made more engaging and enjoyable by using appropriate learning models (Furoidah, 2020).

Among the many available learning models, the researcher decided to use the Project-Based Learning

(PjBL) model. This model is highly suitable for helping students become more active in learning activities and emphasizes group collaboration to achieve shared learning goals effectively (Almulla, 2020; Hussein, 2021; Salahuddin, Saputra, et al., 2023). As Thomas in Sari (2021) states, PjBL is a study strategy that allows educators to manage classroom learning through project-based engagement. Project-based learning fosters creativity and enthusiasm, and project progress can be assessed as an open-ended, contextual, activity-based learning method (Jiang et al., 2023; Nayak et al., 2024; Wu et al., 2020). It is also part of the learning cycle that promotes a mindset for collaborative problem-solving (Arianatasari et al., 2018).

To make the implementation of PjBL more engaging, the researcher integrates it with Audio-Visual Learning Media, which functions to enhance students' interest and active participation. As Ananda et al. (2022) explains, learning media help students learn more easily, attract their attention, activate student engagement, and provide concrete learning experiences. Similarly, Swihadayani (2023) states that students learn actively and enjoyably when appropriate learning media are used. Therefore, this study combines the Project-Based Learning (PjBL) model with three-dimensional learning media to optimize student engagement.

The Project-Based Learning model also offers several advantages, as stated by Luhman (2016) in Sutisnawati et al. (2022).

Method

This research is a Classroom Action Research (CAR). The study aims to examine the implementation of the Project-Based Learning model in Natural and Social Sciences (IPAS) learning for fourth-grade students at SDN Lubuk Harjo. This Classroom Action Research (CAR) was conducted at SD Negeri Lubuk Harjo, Bayung Lencir District, MUBA, South Sumatra, during the second and third weeks of February 2024. The research was carried out in two cycles, with each cycle consisting of 3 sessions of 35 minutes (2 meetings per cycle). Throughout the study, observations were conducted to monitor the learning process.

The research was designed to be conducted in several cycles, referring to the model adapted from Hopkin in Arikunto et al. (2018). Each cycle followed four main procedural steps: (1) planning, (2) action, (3) observation, and (4) reflection, during implementation, these four steps were carried out continuously, with modifications in the planning stage to improve instructional strategies.

The subjects of this study were 19 fourth-grade students at SD Negeri Lubuk Harjo, Bayung Lencir District, consisting of 12 male and 7 female students.
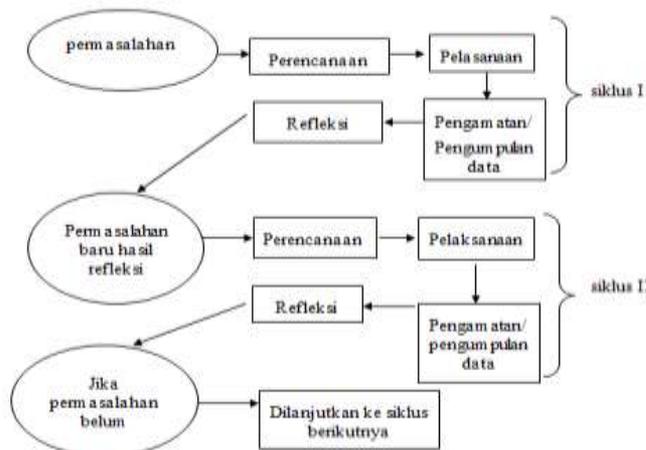

Figure 1. Improvements with two cycles

The data collection techniques used in this study included: (1) observation to gather information about students' behavior in response to teachers' actions (Salahuddin, Putri, et al., 2023), (2) interviews to collect information on the challenges experienced by participants during the learning process, (3) LKPD (Student Worksheets) used as a tool to enhance students' learning outcomes, and (4) tests – used to measure the extent of improvement in students' learning achievements. Observations, interviews, and LKPD were used as secondary data to support and strengthen the research findings.

Results and Discussion

Based on the previous explanation, this research is Classroom Action Research (CAR) using a CAR model adapted from Hopkin. The objective of this study is to improve the learning outcomes of fourth-grade students at SD Negeri Lubuk Harjo through the Problem-Based Learning model in the Natural and Social Sciences (IPAS) subject. This research consists of two cycles, each comprising four stages.

The research findings from Cycle I and Cycle II in fourth-grade at SD Negeri Lubuk Harjo indicate an improvement in students' learning outcomes through the implementation of Problem-Based Learning in IPAS lessons. Based on the obtained results, students' learning outcomes improved from Cycle I to Cycle II. The improvement in learning outcomes can be seen in the following table:

Table 1. Students' Learning Outcomes in Cycle I

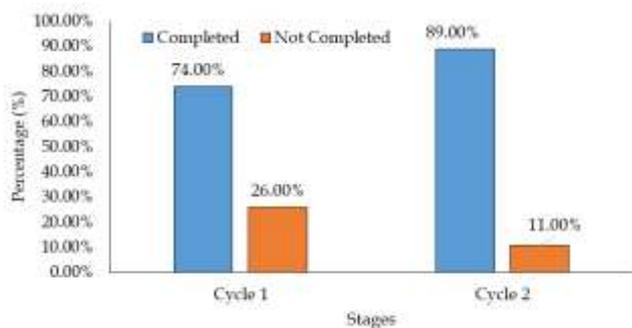| Learning Outcomes	Number of Students	Percentage (%)
Completed	14	74
Non completed	5	26
Average Score	78	.68

From the data in the table above, it is known that the learning outcomes in cycle I produced an average of 78.68 with a completion percentage of 74%. Based on these data, it is known that in cycle I only 14 out of 19 students completed their learning. This means that Cycle II Actions need to be taken to improve the activities that are the targets for improvement. After cycle II, the data in the following table was obtained.

Table 2. Learning Outcomes of Students in Cycle II

Learning Outcomes	Number of Students	Percentage (%)
Completed	17	89
Non completed	2	11
Average Score	90	.83

From the data in the table above, it is known that the learning outcomes in cycle II produced an average of 90.83 with a completion percentage of 84%. Based on these data, it is known that in cycle II there were 17 out of 19 students who completed their learning.

From Tables 1 and 2, it is known that the learning outcomes of students in science lessons through the application of the Problem Based Learning model have increased. The average value of students increased from cycle I by 78.68 to 90.83 in cycle II. The increase in learning outcomes is more visible for cycle II compared to cycle I. The completeness of learning outcomes in cycle II can be seen in the figure 2.

Figure 2. Improvement in students' learning outcomes

The percentage of students' learning outcomes in Cycle I reached 74%, while in Cycle II, it increased to 89%. Thus, the percentage of students achieving mastery has met the success indicator of ≥75%, with an improvement of 15% from Cycle I to Cycle II and an average percentage increase of 12.15%.

Based on the analysis of research findings from Cycle I and Cycle II, which implemented the Problem-Based Learning (PBL) model in IPAS lessons for fourth-grade students at SD Negeri Lubuk Harjo, the results indicate that the Problem-Based Learning model effectively enhances students' learning outcomes. Furthermore, interviews conducted after the learning sessions revealed that almost all students felt happy and enthusiastic during the lessons because they found the teaching method engaging.

The application of the Problem-Based Learning model in IPAS learning had a positive impact on students' learning outcomes. This positive effect is evident from the increase in cycle percentages and students' responses after learning, compared to when the teacher had not yet applied the Problem-Based Learning model in IPAS lessons.

Based on the learning outcome data obtained, the implementation of the Problem-Based Learning (PBL) model in IPAS lessons for fourth-grade students at SD Negeri Lubuk Harjo demonstrated significant improvement. In Cycle I, the average student score was 78.68, with a mastery percentage of 74%, meaning that only 14 out of 19 students achieved mastery criteria. These results indicated the need for further improvements in the learning process to enhance students' outcomes. Consequently, Cycle II was conducted to refine and optimize learning activities.

After the implementation in Cycle II, students' learning outcomes significantly improved. The average score increased to 90.83, with a mastery percentage of 89%, meaning 17 out of 19 students achieved the mastery criteria. Compared to Cycle I, there was a 15% increase in mastery percentage and a 12.15% increase in the average score. This improvement confirms that the Problem-Based Learning model positively impacts students' comprehension and learning achievements.

Beyond the increase in scores, the effectiveness of the Problem-Based Learning model was also reflected in students' positive responses to the applied teaching method. Post-learning interviews revealed that almost all students reported feeling more excited and engaged in learning. This suggests that the implementation of an interactive, problem-solving-based learning model can boost students' motivation, making them more active in understanding the subject matter.

Thus, it can be concluded that the implementation of the Problem-Based Learning (PBL) model in the IPAS subject for fourth-grade students at SD Negeri Lubuk Harjo has successfully improved students' learning outcomes. This model not only enhances academic understanding but also creates a more enjoyable and meaningful learning experience for students. The findings of this study reinforce that the use of appropriate teaching methods can significantly impact the achievement of optimal learning outcomes.

Conclusion

The conclusion of this study is that the implementation of the Problem-Based Learning (PBL) model in IPAS lessons for fourth-grade students at SD Negeri Lubuk Harjo can enhance students' learning outcomes. Moreover, the application of this model helps train students in higher-order thinking skills and supports them in exploring their knowledge and skills independently.

Author Contributions
The research team contributed to the writing of this scientific work as follows: DP: Idea generation, conceptualization, data collection, analysis and interpretation of results, manuscript preparation, ZKP & JJ: Guidance in writing the article, DP & ANS: Funding acquisition.

Conflicts of Interest
The authors declare no conflicts of interest regarding the publication of this article.

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