



Scientific Journal of Education Citra Bakti

p-ISSN 2355-5106 || e-ISSN 2620-6641

<https://jurnal.citrabakti.ac.id/index.php/jil>



APPLICATION OF LEARNING MODEL PROBLEM BASED LEARNING IN NATURAL AND SOCIAL SCIENCE SUBJECTS TO IMPROVE THE LEARNING OUTCOMES ELEMENTARY STUDENTS

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Article History

Received:
March 20, 2026

Accepted:
May 2, 2026

Published:
May 21, 2026

Abstract

The low learning outcomes of fourth-grade science students at MI Al-Azhar Muara Pinang was the main driver of this research, which highlighted the need for more creative teaching methods. The goal of this project is to use the Problem Based Learning paradigm to improve student engagement and learning outcomes. Classroom Action Research, which is carried out in two cycles with the planning, implementation, observation, and reflection phases, is the type of research used. Fourteen fourth-grade students were made the subjects of the study. Multiple-choice learning outcome exams and observation of student activities were used as data collection methods, and qualitative and quantitative descriptive data analysis was carried out. Through problem-solving-based exercises that actively engage students in group projects, presentations, and conversations, the Problem-Based Learning approach is implemented. With a completion rate of 92.8%, the research findings show an increase in student learning outcomes. This shows that problem-based learning approaches are successful in improving student engagement and learning outcomes.

Keywords: Learning Outcomes, Problem Base Learning, Student Activities

Background

Education is the foundation of human resource development because it not only teaches facts and figures but also shapes human morality and ethics (Abubakar, 2021). If education can inspire students to make significant changes in their behavior, then the learning process has been successful (Zagoto et al., 2024). Both this and the provisions of Law No. 20 of 2003 on the National Education System are supported by the Quran, specifically verse 11 of Surah Al-Mujadilah, which states that knowledge is power and that knowledge is necessary for the advancement of human dignity. According to Ismail (2024), to improve learning standards and student achievement, effective pedagogical innovations are needed, such as the Problem-Based Learning (PBL) paradigm.

An individual's knowledge, skills, and attitudes can change as a result of their experiences through intentional learning processes (Dhori, 2021). The extent to which students retain information after engaging in learning activities is known as learning outcomes (Nurhayati et al., 2025), which serve as indicators of learning success (Apriani & Ramadhani, 2025). According to Benjamin Bloom's framework, the cognitive, affective, and psychomotor domains are all part of learning outcomes (Huseng & Auliyaudin, 2025); learning outcomes are influenced by internal and external factors such as motivation, ability, environment, and the quality of instruction (Isini et al., 2025). Applying the Problem-Based Learning (PBL) paradigm in science education is highly relevant because it helps students gain a better understanding of abstract concepts through hands-on activities, which in turn enables them to distinguish between needs and wants more clearly and deeply (Setyo et al., 2020).

According to Tarumasely (2024), a student-centered learning approach provides students with the opportunity to be more active in the learning process. In line with the research by Aulia Indriani et al. (2024), this approach positions students not merely as recipients of information, but as the primary agents directly engaged in constructing knowledge through learning experiences. Students are encouraged to think critically, express their opinions, and explore various relevant learning resources (Haliza, 2024). Furthermore, students' active participation in discussions, group work, and problem-solving fosters a greater sense of responsibility for their own learning process (Siregar, 2021). Consequently, learning becomes more meaningful, contextual, and enduring over time because it is acquired through real-world experiences and deep thinking processes.

Based on the results of the preliminary observation, the implementation of IPAS instruction at MI Al-Azhar Muara Pinang still faces several challenges, including limited learning resources, a learning system still dominated by conventional teacher-centered methods, and low levels of active student participation in the learning process. More than 50% of fourth-grade students exhibit signs of these issues, which are associated with poor

motivation and learning outcomes. The Learning Objective Achievement Criteria (KKTP) is set at 70 points, yet a significant number of students continue to receive average KKTP scores between 60 and 65 points. Based on these results, it is clear that current teaching methods are ineffective and students are not getting the most out of their time in class; therefore, a new approach to education, such as Problem-Based Learning (PBL), is necessary.

Learning in Integrated Natural and Social Sciences (IPAS) combines the theoretical and practical aspects of the social and natural sciences (Suhelayanti et al., 2023) in a way that facilitates both theoretical understanding and direct application. According to Kartikasari's research (2020), science teaches students about the world around them and how everything works, while inspiring them to think creatively, rationally, and critically to address the problems they face in the real world (Wahyudi et al., 2023)

Students' interest in learning and critical thinking skills can be enhanced through the Problem-Based Learning (PBL) model, which focuses on solving real-world problems faced by students (Murtikusuma, 2024). By utilizing real-world issues and their accompanying solutions, research by Lestari et al. (2023) indicates that PBL trains students to think critically, creatively, and independently. It simultaneously develops their ability to work in teams, collaborate, and engage in higher-order thinking (Mayanksari, 2023). Rakhmawati (2021). Learning becomes more meaningful when students use PBL, which offers various benefits, including the development of critical thinking skills, motivation, independence, and collaboration.

Thus, the implementation of IPAS learning integrated with the Problem-Based Learning model not only enhances student engagement in the learning process but also has a direct impact on improving learning outcomes (Haliza, 2024). Learning outcomes in the context of IPAS reflect students' ability to understand concepts, apply knowledge, and demonstrate scientific attitudes in daily life (Wahyudi et al., 2023). This improvement in learning outcomes is evident in students' ability to analyze problems, draw conclusions, and connect learned concepts to real-world situations (Wandini et al., 2022). Furthermore, integrated learning that combines theoretical and practical aspects helps students develop a deeper and more sustainable understanding. Therefore, the use of innovative learning models such as PBL in IPAS is an effective strategy for comprehensively improving the quality of student learning outcomes.

Method

In this study, 14 sixth graders participated in Classroom Action Research (PTK). Four female students and ten male students from MI Al-Azhar Muara Pinang were the subjects of the study. This study uses the spiral methodology of Stephen Kemmis and Robin McTaggart, which includes planning, carrying out activities, observation, and reflection. Data was collected

through tests and documentation, then analyzed quantitatively and descriptively. The following formula was used to evaluate the test results (Purnama et al., 2020):

1. Percent Value 2. Class Average

$$NP = \frac{R}{SM} \times 100$$

Keterangan :

NP = Nilai persen yang dicari atau diharapkan
R = Skor yang diperoleh
SM = Jumlah Siswa yang datang
100 = Bilangan tetap

$$R = \frac{\sum x}{\sum n}$$

Keterangan :

R = Nilai rata-rata
 $\sum x$ = Jumlah semua nilai siswa
 $\sum n$ = Jumlah siswa yang mengikuti tes

Result and Discussion

Results

The application of the PBL model has been proven to develop the learning outcomes of social studies of grade IV A MI Al-Azhar Muara Pinang students from pre-cycle to the final stage, which is measured through a daily test in the form of 10 multiple-choice questions, as shown in the following data.

The following overview of student learning outcomes is obtained from the results of pre-cycle observations:

Table 1.1 Pre-cycle Learning Outcomes

CD	Lowest Score	Highest Score	Conclusion	Incomplete
70	25	80	3	11
Completeness of Learning Outcomes : 24.4%				

The graph shows that before the implementation of PBL, student learning outcomes were still poor and had not reached the minimum competency level (KKTP), with only 21.4% completing them. Students are less engaged and do not fully understand the information due to the lack of variety in the curriculum and the dominance of lecture methods. Of the 14 students, only 3 students (21.4%) have completed, while 11 students have not completed. Graph 1.1 presents the pre-cycle results in detail.



Figure 1.1 Pre-cycle Learning Outcomes Achievement Graph

Based on the data, the learning outcomes of grade IV A MI Al-Azhar Muara Pinang students in the first cycle increased after the implementation of PBL, but it was not maximized

with the achievement of completeness of learning outcomes obtained only reaching 50%. Meanwhile, the KKTP determined by the school is 70%.

Table 1.2 Achievement of Learning Outcomes of Cycle I

CD	Lowest Score	Highest Score	Conclusion	Incomplete
70	40	80	7	7
Completeness of Learning Outcomes : 50%				

Learning outcomes increased with an average of 62.14 and a completion rate of 50% after the implementation of Problem-Based Learning (PBL) in cycle I; However, this is not ideal, so changes are needed in the next cycle.

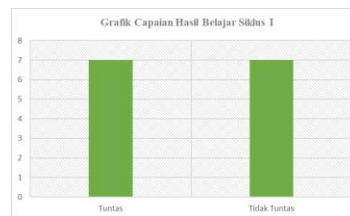


Figure 1.2 Graph of Learning Outcomes Cycle I

a. Reflection

Based on the results of the reflection of the first cycle, although the implementation of *Problem Based Learning* (PBL) showed an increase in learning outcomes with an average of 62.14 and 50% completeness, learning was not optimal because several obstacles were still found, such as students lacking focus, still noisy, not actively asking questions, and uneven group cooperation. Therefore, it is important to make improvements in cycle II through strengthening class rules, providing ice breaking, using lighter questions, increasing overall student involvement in group roles, and providing guidance and motivation in the form of appreciation. It is expected that these improvements will maximize student engagement, collaboration, and learning outcomes.

1. Cycle II

To measure students' understanding of the information needed, the teacher gave ten self-test questions during the second meeting of cycle II. In cycle II, the learning objectives are listed:

Table 1.3 Achievement of Learning Outcomes in Cycle II

CD	Lowest Score	Highest Score	Conclusion	Incomplete
70	60	100	13	1
Completeness of Learning Outcomes : 92.8%				

Based on statistics, the learning outcomes of cycle II students increased to 92.8%, showing that grade IV.A students at MI Al-Azhar Muara Pinang have

experienced an increase in skills. The majority of students have met the KKTP (Qualifying Competency Standards) due to the use of PBL.

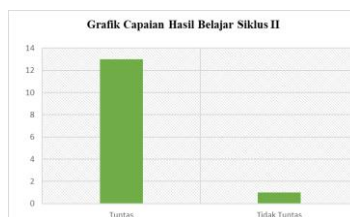


Figure 1.2 Cycle II Learning Outcome Achievement Graph

Student involvement in the learning process is enhanced through problem-solving activities, facilitated by the Problem-Based Learning (PBL) model, as evidenced by the improvement in learning outcomes from pre-cycle to cycle II. Students will find it much easier to understand the subject matter. Based on the data, we can see that the average score and percentage of learning completion have increased; in the pre-cycle, the score was 52.5 (21.4%), in the first cycle it was 62.14 (50%) and in the second cycle it was 81.4 (92.8%), thus meeting the KKTP.

a. Reflection

Increased learning outcomes and more active participation of students in achieving learning objectives were seen in the second cycle. Students show greater initiative in group projects, have a deeper understanding and better problem-solving abilities. Therefore, the need for further research is eliminated as the research objectives have been achieved.

Discussion

This classroom action research was conducted in several stages: planning, implementation, and observation in Cycle I, followed by Cycle II. The research began by identifying the initial learning conditions in Class IV A at MI Al-Azhar Muara Pinang. Based on the observations, the learning process was still dominated by the lecture method, causing students to be passive, easily bored, and not actively engaged in learning activities. Furthermore, the use of diverse learning models and media remained very limited, resulting in a less engaging learning environment that failed to encourage students to think critically or participate optimally.

Given these conditions, the researcher implemented the Problem-Based Learning (PBL) model as an effort to improve the learning process by integrating hands-on activities in the form of buying and selling simulations. In Cycle I, the lesson was designed to involve students as buyers, while the teacher acted as the seller to provide examples and guidance. Then, in Cycle II, the students' roles were made more active, with all students directly participating by taking turns as sellers and buyers within their groups. This activity made the learning atmosphere more lively and interactive. Next, students worked on worksheets through

group discussions, presented the results of their discussions, and gave other groups the opportunity to provide feedback in the form of criticism and suggestions. This process not only improved students' understanding but also built their confidence and communication skills.

Instructional improvements were continued in Cycle II because the results from Cycle I, although showing an improvement, had not yet reached the expected level of mastery. In Cycle I, the students' average score remained at 62.14, with a mastery rate of 50%. Therefore, instructional strategies were refined in Cycle II, in terms of classroom management, role assignment, and guidance during discussions. The results showed a significant improvement, with student activity increasing from a score of 3.21 to 3.7, which falls into the "good" category. Additionally, student learning outcomes saw a substantial increase, with the average score reaching 81.4 and a mastery rate of 92.8%.

This success is even more evident when compared to the control class, IV B, which did not implement the PBL model. In that class, student learning outcomes remained low, with an average score of 61.3 and a mastery rate of only 40%. This comparison demonstrates that the implementation of the Problem-Based Learning (PBL) model has a positive impact on enhancing student engagement and learning outcomes. Thus, the use of a learning model that actively and contextually involves students has proven capable of creating a more meaningful, enjoyable, and effective learning process in improving student understanding.

Table 1.3 Outcome Achievement of Control Class IV.B

CD	Lowest Score	Highest Score	Conclusion	Incomplete
70	40	80	6	9
Completeness of Learning Outcomes : 40%				

This situation indicates that the learning process is not yet optimal in terms of understanding the material. In the classroom, many students still struggle to grasp the material, particularly when it comes to the concept of needs. It is evident that many students have difficulty distinguishing between primary, secondary, and tertiary needs. In addition, some students appear hesitant and lack confidence when answering questions, resulting in inconsistent and inaccurate responses.

In contrast, in Class 4A—the experimental class that used the Problem-Based Learning model—there was a significant improvement in each cycle, both in terms of average scores and in the percentage of students who met the learning standards and demonstrated active participation. This difference indicates that the implementation of the Problem-Based Learning model had a more positive impact on improving student learning outcomes and engagement compared to the previous teaching method.

This improvement indicates that the implementation of Problem-Based Learning (PBL) through contextual practice is effective in fostering students' active engagement in the learning process. Students do not merely passively receive the material but are directly involved in activities that require them to think, discuss, and solve problems related to daily life. This deepens students' understanding of the material, particularly in distinguishing between types of needs—such as primary, secondary, and tertiary—because they experience the learning process firsthand.

In addition, the implementation of PBL also has a positive impact on students' self-confidence and communication skills. Through group discussions, presentations, and peer feedback, students become more confident in expressing their opinions and are not hesitant to complete assignments. Although there are some challenges in implementation, such as a less-than-ideal classroom environment and external distractions, these obstacles can be overcome through better classroom management and intensive, targeted teacher guidance.

Overall, the use of the Problem-Based Learning (PBL) model has proven effective in increasing student engagement, improving the quality of the learning process, and significantly enhancing learning outcomes. This model makes learning more meaningful, engaging, and relevant to students' lives. Thus, PBL can serve as an effective alternative learning model to be implemented in IPAS instruction to optimally achieve learning objectives.

Conclusion

The results of the Classroom Action Research (CAR) conducted with students in Class IV.A at MI Al-Azhar Muara Pinang indicate that the implementation of the Problem-Based Learning (PBL) model was able to improve student learning outcomes and engagement in the IPAS subject, specifically on the topic "My Business Meets My Needs." This was evident from the changes observed at each stage of the learning process, where students became more engaged and demonstrated a better understanding of the material compared to before the intervention.

Improvements in student learning outcomes are evident from the average scores and mastery rates in each cycle. In the pre-cycle phase, the average student score was only 52.5, with a mastery rate of 21.4%. After implementing PBL in Cycle I, the average score increased to 62.14 with a mastery rate of 50%. In Cycle II, a significant improvement occurred, with the average score reaching 81.4 and a mastery rate of 92.8%, indicating that the majority of students had met the Learning Objective Achievement Criteria (KKTP) set by the school.

In addition, student engagement in learning also increased from Cycle I to Cycle II and was higher than that of the control class, which did not use PBL. This model has proven

effective in encouraging students to actively discuss, collaborate, and present their learning outcomes. Thus, the implementation of Problem-Based Learning not only improves learning outcomes but also the quality of the learning process, making it a viable alternative for the IPAS learning model in elementary schools.

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