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IMPLEMENTATION OF PROJECT-BASED LEARNING TO IMPROVE SCIENCE AND SOCIAL LEARNING (IPAS) OUTCOMES OF THIRD-GRADE ELEMENTARY STUDENTS

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Abstrak

Natural and Social Sciences (IPAS) is a subject that aims to help students understand natural phenomena and the relationship between humans and their environment. However, third-grade elementary school students often experience difficulties in understanding IPAS concepts, especially in lessons that require direct observation and simple experiments. This study aimed to improve students' learning outcomes through the implementation of the Project-Based Learning (PjBL) method. The research employed both qualitative and quantitative approaches using Classroom Action Research (CAR), which was conducted in two cycles consisting of planning, action, observation, and reflection stages. The subjects of this study were 25 third-grade students of SD Negeri Sedep 01 in the 2026/2027 academic year. In the first cycle, students conducted an activity to identify the effect of sunlight on bean growth, while in the second cycle, students learned about changes in the states of matter through an ice cream-making activity. The results showed that the implementation of the PjBL method improved students' learning outcomes in IPAS. The average student score in the first cycle was 75 with a learning mastery percentage of 69%, while in the second cycle the average score increased to 87 with a learning mastery percentage of 96%. Therefore, the Project-Based Learning method is effective in improving IPAS learning outcomes for third-grade elementary school students.

Kata Kunci: *project-based learning, learning outcomes, elementary school students.*

PENDAHULUAN

Basic education plays a crucial role in developing children's cognitive, social, and emotional abilities. A strong foundation in basic education can support the success of learning processes at higher levels of education, in line with UNESCO's findings emphasizing the importance of effective basic education implementation (Putri, 2024). Furthermore, basic education also has a strategic role in shaping both individuals and society, as it not only focuses on the development of learning abilities, but also on the formation of students' character and social skills (Sherboeva, 2024).

Basic education should not only focus on developing fundamental skills such as reading, writing, and arithmetic, but also pay attention to students' social and emotional development. Elementary schools play an important role in creating student-centered learning through emotional support and the establishment of positive social interactions. Research indicates that integrating Social Emotional Learning (SEL) into the curriculum can enhance students' emotional intelligence, which contributes significantly to their academic and social development. This approach not only improves self-awareness and empathy but also strengthens peer relationships and students' emotional well-being (Dutta, 2025). Furthermore, quality basic education should encourage students to think critically,

collaborate, and solve problems through meaningful learning activities. The development of critical thinking skills among elementary school students is essential because it equips them with the ability to analyze, evaluate, and reflect on societal changes, thereby fostering collaboration and problem-solving skills through relevant and meaningful educational activities (Sobirovich & qizi, 2025).

In terms of cognitive development, the theories proposed by Piaget and Vygotsky remain relevant and are supported by recent studies. The role of teachers in providing guidance and assistance is still necessary to help students understand new concepts effectively (Zulfatunnisa, 2022). In addition, elementary school students still require concrete examples in the learning process to support their logical thinking abilities, as explained in Piaget's theory of the concrete operational stage (Madanagopal, 2020).

Based on these considerations, elementary schools need to ensure that the learning process is active, collaborative, and connected to students' daily experiences. Basic education is not only intended to develop academic competence, but also to foster creativity, collaboration skills, and adaptability so that students are prepared to face future changes (Arodani et al., 2025). These competencies can be developed through IPAS learning.

IPAS is a field of study that examines living organisms and their interactions with the environment and the universe (Prihatini et al., 2024). IPAS learning represents the integration of Natural Sciences (IPA) and Social Sciences (IPS). The integration of these two disciplines aims to encourage students to understand and manage both the natural and social environments around them in an integrated manner (Alwi et al., 2024). Therefore, IPAS learning in elementary schools serves as an important medium for developing critical thinking skills, fostering curiosity, and cultivating students' scientific attitudes (Kuncoro et al., 2025).

The IPAS (Integrative Natural and Social Sciences) model emphasizes an inquiry-based learning approach, fostering students' engagement through observation, questioning, experimentation, and discussion. This constructivist framework allows learners to build knowledge holistically, connecting natural and social phenomena. The integration of IPA and IPS within the curriculum enhances students' understanding of their environment and promotes critical thinking skills (Himawan et al., 2025)

This is consistent with the cognitive developmental characteristics of elementary school students, who still require concrete learning experiences to understand concepts effectively. Learning based on concrete experiences has been proven to improve students' understanding of scientific concepts at the elementary school level (Hulwah & Suriani, 2025). In line with this, within the Merdeka Curriculum, IPAS learning is designed not only to help students understand concepts theoretically, but also to enable them to apply these concepts in their daily lives through exploration, observation, and simple experimental activities (Fitri & Zainil, 2025).

However, in practice, various problems are still encountered in the implementation of IPAS learning in elementary schools. Many students appear less enthusiastic during the learning process and experience difficulties in understanding abstract concepts. This condition is influenced by the continued use of teacher-centered learning methods, causing

students to become passive and less actively involved in the learning process (Syamsidar, 2022). Teachers tend to rely more on lectures and question-and-answer methods without engaging students in exploration activities that provide direct learning experiences. As a result, students do not obtain meaningful and contextual learning experiences in accordance with the characteristics of IPAS learning in elementary schools (Kusmana & Putri, 2025).

Based on preliminary observations conducted at SD Negeri Sedep 01, students' involvement in the IPAS learning process was still relatively low. Most students tended to be passive and only listened to the teacher's explanations without participating in scientific activities during the lesson. This condition affected students' learning outcomes, particularly in materials requiring direct observation activities. Therefore, it is necessary to implement a learning model capable of improving learning activities, student engagement, and concrete conceptual understanding. One contextual learning model that can be applied in IPAS learning is Project Based Learning (PjBL) (Kamilah & Astriani, 2024). The implementation of IPAS learning in elementary schools through the Project Based Learning (PjBL) model has been proven effective in improving students' critical thinking skills, fostering curiosity, and developing students' scientific attitudes (Riasty & Sari, 2024).

Based on these problems, this study attempts to implement the Project Based Learning (PjBL) model in IPAS subjects for third-grade elementary school students. Project Based Learning (PjBL) is a student-centered learning model that engages students in real-world tasks, encouraging them to solve relevant problems rather than merely receiving information passively (Suryani, 2024). In addition, the implementation of PjBL can improve conceptual understanding because students learn through direct and contextual experiences that create meaningful learning (Hadisah & Muthi, 2025).

METODE PENELITIAN

This study employed a qualitative approach using Classroom Action Research (CAR) to improve and enhance the quality of the learning process systematically, reflectively, and collaboratively. The qualitative approach was selected because the study focused not only on students' learning outcomes but also on changes in students' behavior, engagement, and learning experiences during the instructional process. The research was conducted in the Natural and Social Sciences (IPAS) subject through the implementation of the Project-Based Learning (PjBL) method. The study was carried out in two cycles, each consisting of planning, action implementation, observation, and reflection stages. In Cycle I, the learning activities focused on identifying the effect of sunlight on bean growth, while Cycle II focused on the concept of changes in the states of matter through an ice cream-making project. The participants of this study were 25 third-grade students of SDN Sedep 01, Kertasari District, Bandung Regency, consisting of 12 male students and 13 female students in the first semester of the 2025/2026 academic year. Cycle I was conducted on October 6, 2025, while Cycle II was conducted on October 27, 2025.

The data collection techniques combined quantitative and qualitative methods to obtain comprehensive and accurate research findings. Quantitative data were collected

through learning achievement tests in the form of pretests and posttests to measure students' improvement in understanding IPAS concepts after the implementation of the PjBL method. In addition, a simple questionnaire was administered to identify students' motivation and perceptions toward the learning process. The questionnaire was designed according to the characteristics of elementary school students to ensure that it was easy for them to understand and complete. Meanwhile, qualitative data were obtained through direct classroom observations during the learning activities. The observations were conducted using observation sheets containing indicators such as students' activeness, collaboration skills, participation in project activities, and involvement in each stage of the PjBL process. Supporting data were also collected through documentation, including photographs of learning activities, field notes, students' worksheets, and project results. The combination of these data collection techniques was intended to enhance data validity and provide a comprehensive description of both the learning process and learning outcomes throughout the study.

HASIL DAN PEMBAHASAN

Cycle I

Cycle I was conducted over a two-week period in the Natural and Social Sciences (IPAS) subject with the topic The Effect of Sunlight on Bean Growth. The learning process implemented the Project-Based Learning (PjBL) model, which emphasized simple experimental activities to encourage active student participation and collaborative learning. During the planning stage, the teacher prepared Student Worksheets (LKPD) containing systematic observation procedures, including preparing planting media, planting bean seeds, recording daily growth, and drawing conclusions based on the observation results. Students were divided into small groups consisting of four to five members to carry out the project collaboratively. Each group planted bean seeds in two different containers under different environmental conditions: Container A was placed in an area exposed to sunlight, while Container B was placed in a dark area without sunlight exposure.

Throughout the learning activities, students conducted daily observations and recorded data related to stem height, leaf color, and overall plant conditions in the worksheets provided. At the end of the observation period, each group presented the results of their experiment and formulated conclusions regarding the importance of sunlight for plant growth. The implementation of the project in Cycle I demonstrated an increase in students' enthusiasm and participation compared to the initial learning conditions. Most students actively engaged in planting activities, recording observation results, and participating in group discussions. Nevertheless, several challenges were identified during the implementation process. Some students were not yet consistent in conducting daily observations, several project reports lacked completeness and systematic organization, and group discussions were often dominated by only a few students, while others remained relatively passive.

Fig 1. Experiment in Cycle I

The evaluation results in Cycle I were obtained through a final achievement test and observations of students' learning activities during the instructional process. The findings showed that the average class score reached 75, with a learning mastery percentage of 69% among the 25 participating students. These results indicate that the implementation of the PjBL model contributed positively to students' learning engagement and academic achievement, although improvements in collaboration and reporting skills were still required for the subsequent cycle.

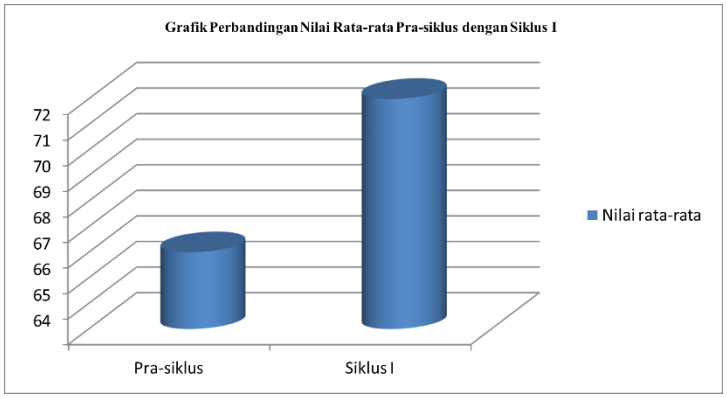
Tabel 1. List of Students' Achievement Scores in the Cycle I Remedial Learning Activities

Number of Student	M/F	Score	Learning Mastery
1	F	60	Did Not Achieve Mastery
2	M	75	Achieved Mastery
3	M	60	Did Not Achieve Mastery
4	M	75	Achieved Mastery
5	F	85	Achieved Mastery
6	F	60	Did Not Achieve Mastery
7	M	60	Did Not Achieve Mastery
8	F	60	Did Not Achieve Mastery
9	M	85	Achieved Mastery
10	F	85	Achieved Mastery
11	F	80	Achieved Mastery

Number of Student	M/F	Score	Learning Mastery
12	F	60	Did Not Achieve Mastery
13	F	85	Achieved Mastery
14	F	85	Achieved Mastery
15	M	85	Achieved Mastery
16	M	80	Achieved Mastery
17	M	80	Achieved Mastery
18	M	60	Did Not Achieve Mastery
19	M	85	Achieved Mastery
20	F	80	Achieved Mastery
21	F	85	Achieved Mastery
22	M	60	Did Not Achieve Mastery
23	F	80	Achieved Mastery
24	M	80	Achieved Mastery
25	F	80	Achieved Mastery
Total Score		1870	
Average Score		75	

The evaluation results in Cycle I were obtained through a final achievement test and observations of students' learning activities during the instructional process. The findings showed that the average class score reached 75, with a learning mastery percentage of 69% among the 25 participating students. These results indicate that the implementation of the PjBL model contributed positively to students' learning engagement and academic achievement, although improvements in collaboration and reporting skills were still required for the subsequent cycle.

Graph 1. The Comparison of Average Scores Between the Pre-Cycle and Cycle I



Based on Graph 1, there was an improvement in students' learning outcomes from the pre-cycle stage to Cycle I. In the pre-cycle stage, the average student score was 66, with a learning completeness percentage of 56%. After the implementation of learning activities in Cycle I, the average score increased to 75, while the level of learning completeness reached 69%. These findings indicate that the implementation of the Project Based Learning (PjBL) model began to have a positive impact on both the learning process and students' achievement.

The project-based learning approach encouraged students to become more actively involved in the learning process through contextual and engaging hands-on activities. Students were not merely passive recipients of information; instead, they were trained to observe, analyze, and draw conclusions independently based on the projects they completed. This condition reflects an improvement in students' participation and understanding in the IPAS subject.

However, the results obtained in Cycle I had not yet fully achieved the research success indicators, as the learning completeness level only reached 69%, while the predetermined target required at least 85% of students to achieve a minimum score of 75. Based on the reflection results from the implementation of Cycle I, several aspects needed improvement in the subsequent cycle. First, the teacher needed to provide clearer and more systematic guidance on how to record observational data so that students' reports would become more organized and comprehensible. Second, the distribution of roles within each group needed to be managed more proportionally to ensure that all students actively contributed to the project activities. Third, project presentation sessions needed to be optimized as discussion forums to strengthen students' scientific understanding through intergroup interaction.

By improving these aspects, it was expected that the implementation of Cycle II would enhance students' participation, improve the quality of observation reports, and significantly increase learning outcomes. Overall, the implementation of learning improvement activities in Cycle I demonstrated an increase in students' mastery and learning completeness in the IPAS subject. Therefore, the researcher planned to continue the learning improvement process in Cycle II to further improve students' achievement so that all students could achieve Minimum Completeness Criteria.

Cycle II

Cycle II was conducted as a follow-up to the reflection results obtained from Cycle I. The reflection revealed several aspects that still required improvement, including increasing the active participation of all group members, improving the accuracy of recording activity results, and enhancing students' ability to formulate conclusions based on experimental findings.

In Cycle II, the IPAS learning activities focused on the topic of changes in the states of matter through a simple ice cream-making project. The project utilized materials that were easily found in the surrounding environment, such as liquid milk, sugar, ice cubes, and salt. This project was designed to help students understand the concept of changes in the states of matter from liquid to solid through direct and contextual learning experiences.

The implementation of the learning improvement activities in Cycle II was carried out on October 27, 2025, by applying the stages of Project Based Learning (PjBL). The learning process began with the teacher presenting a fundamental question regarding why ice cream could freeze. Subsequently, the students and teacher collaboratively planned the project by determining the procedures, tools, and materials required for making simple ice cream.

During the project implementation stage, students worked collaboratively in groups to mix the ingredients according to the established procedures. The mixture was then placed in plastic bags and shaken together with ice cubes mixed with salt until the freezing process occurred. Throughout the activity, students observed the transformation of the liquid mixture into a solid form and discussed the scientific processes involved in the experiment. After completing the project, each group presented the results of their experiment and explained the factors influencing the freezing process of the ice cream. In the final stage, the teacher and students conducted a reflection session and formulated conclusions regarding the concept of changes in the states of matter based on the activities that had been carried out.

Throughout the learning process, the teacher acted as a facilitator by providing guidance, direction, and gradual reinforcement of concepts. The learning atmosphere became more active, interactive, and enjoyable because students were directly involved in contextual experimental activities related to everyday life.

The evaluation results at the end of Cycle II demonstrated a significant improvement in students' learning outcomes compared to Cycle I. Of the 25 students participating in the learning activities, the class achieved an average score of 87, with a learning completeness percentage of 96%. A total of 24 students successfully achieved the Minimum Completeness Criteria, while only one student had not yet achieved learning mastery.

Tabel 2. List of Students' Score Results Obtained During the Learning Improvement Activities

Number of Student	M/F	Score	Learning Mastery
1	F	90	Achieved Mastery
2	M	90	Achieved Mastery
3	M	63	Did Not Achieve Mastery
4	M	85	Achieved Mastery
5	F	90	Achieved Mastery
6	F	90	Achieved Mastery
7	M	85	Achieved Mastery
8	F	85	Achieved Mastery
9	M	90	Achieved Mastery
10	F	90	Achieved Mastery

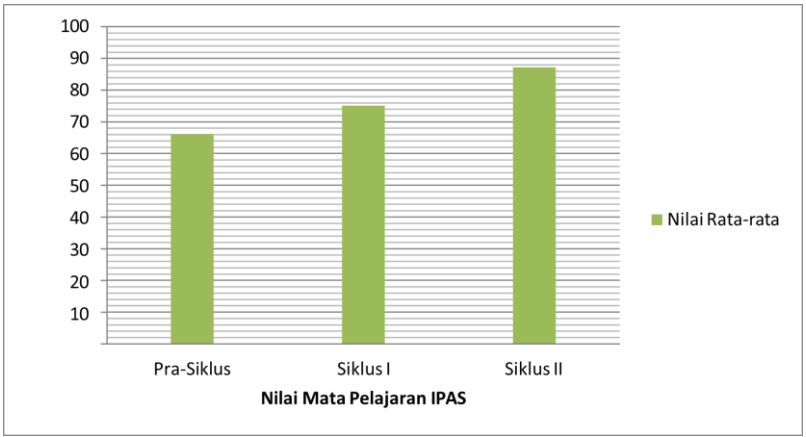
Number of Student	M/F	Score	Learning Mastery
11	F	80	Achieved Mastery
12	F	90	Achieved Mastery
13	F	90	Achieved Mastery
14	F	90	Achieved Mastery
15	M	90	Achieved Mastery
16	M	80	Achieved Mastery
17	M	80	Achieved Mastery
18	M	90	Achieved Mastery
19	M	90	Achieved Mastery
20	F	82	Achieved Mastery
21	F	90	Achieved Mastery
22	M	90	Achieved Mastery
23	F	90	Achieved Mastery
24	M	90	Achieved Mastery
25	F	90	Achieved Mastery
Total Score		2.175	
Average Score		87	

Table 2 illustrated the learning achievement of third-grade elementary school students in the IPAS subject during Cycle II. Based on the evaluation results, the class achieved an average score of 87, with a learning completeness percentage reaching 96%. These findings indicate that the implementation of learning improvement activities in Cycle II had a positive impact on improving students' learning outcomes.

The improvement in students' academic achievement can be observed from the learning analysis results, which demonstrated significant progress compared to the previous stages. The implementation of the applied learning model in Cycle II was able to enhance students' understanding of the subject matter and encourage more active participation in the learning process.

To provide a clearer description of the development of students' learning outcomes, the researcher presents a comparison graph of the learning results in the pre-cycle, Cycle I, and Cycle II stages. The graph illustrates the improvement in the beginning reading ability of third-grade elementary school students in the Indonesian language subject after the implementation of learning improvement activities in each cycle.

Graph 2. The Comparison of Average Scores Between the Pre-Cycle, Cycle I and Cycle II



Based on Graph 2, there was a consistent improvement in students' learning outcomes throughout each learning cycle. In the pre-cycle stage, the students' learning completeness level reached 37%, with an average score of 66. After the implementation of the actions in Cycle I, the learning completeness level increased to 69%, with an average score of 75. Furthermore, in Cycle II, a more significant improvement was observed, as the classical learning completeness level reached 96% with an average score of 87. These findings indicate that the implementation of learning improvement activities in Cycle II successfully enhanced students' abilities in the IPAS subject.

The application of the Project Based Learning (PjBL) model in Cycle II proved to be effective in improving both students' learning outcomes and their learning activities during the instructional process. Through the simple ice cream-making project, students gained direct learning experiences related to the concept of changes in the states of matter from liquid to solid. These authentic experiences enabled students to understand abstract concepts more concretely and easily.

The improvement in learning outcomes, from an average score of 75 with a learning completeness percentage of 69% in Cycle I to an average score of 87 with a completeness percentage of 96% in Cycle II, demonstrates significant progress. These findings are consistent with Hosnan's (2016) opinion that the Project Based Learning model can enhance students' critical thinking skills, curiosity, and understanding of scientific concepts through meaningful and authentic learning experiences.

In addition to improvements in cognitive aspects, progress was also observed in students' non-cognitive skills, including collaboration, communication, and responsibility in completing group assignments. During the learning activities, students learned to respect their peers' opinions, distribute tasks proportionally, and present the results of discussions and projects with greater confidence.

Therefore, the implementation of the Project Based Learning model not only contributed to improving students' understanding of IPAS concepts but also supported the development of social competencies and positive character traits in accordance with the objectives of the Merdeka Curriculum. Based on these findings, it can be concluded that

project-based learning is highly relevant for implementation at the elementary school level because it provides opportunities for students to engage in active, creative, and contextual learning processes appropriate to their developmental stages.

KESIMPULAN

Based on the results of the classroom action research conducted in two cycles in the IPAS learning process for third-grade elementary school students, it can be concluded that the implementation of the Project Based Learning (PjBL) model was effective in improving students' participation, engagement, and learning outcomes. Project-based learning was able to create a more active, interactive, and enjoyable learning environment through contextual activities that encouraged students to develop critical thinking, collaboration, communication, and creativity skills. In addition to improving cognitive achievement, the implementation of PjBL also had a positive impact on students' affective and psychomotor aspects, including responsibility, curiosity, and teamwork skills. The improvement in learning outcomes was reflected in the increase in the average score from 75 with a learning completeness percentage of 69% in Cycle I to 87 with a completeness percentage of 96% in Cycle II. Therefore, the PjBL model is recommended as a student-centered learning alternative, particularly for IPAS materials that require direct learning experiences and experimental activities. Support from schools through the provision of adequate learning facilities, as well as further research on different materials and educational levels, is also necessary to optimize the implementation of project-based learning.

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