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IMPROVING STUDENT LEARNING PROCESSES AND OUTCOMES USING *THE DISCOVERY LEARNING MODEL* IN SCIENCE LEARNING IN GRADE VI OF ELEMENTARY SCHOOL STATE 198/VI VILLAGE OF ULAK MAKAM

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ABSTRACT
This classroom action research was conducted with the aim of improving the quality of the learning process and student learning outcomes in the Natural and Social Sciences (IPAS) subject through the use of the *Discovery Learning model* . The research was conducted at SD Negeri 198/VI Ulak Makam Village in the even semester of the 2024/2025 academic year with 20 sixth grade students as subjects, and was designed in two cycles which included the planning, action implementation, observation, and reflection stages. Data collection techniques used included learning outcome tests, teacher and student observation sheets, and documentation, where all instruments had been validated in advance by material experts and instrument experts to ensure the suitability of the material, level of difficulty, competency achievement indicators, and the accuracy of teacher performance assessments and student activities. Data analysis was carried out descriptively quantitatively and qualitatively. The results of the study showed an increase in teacher performance from 64.28% in the first meeting of cycle I to 78.57% in the second meeting, then increased further to 85.71% and 92.85% in cycle II, while student activity developed from 45% in the first meeting of cycle I to 65% in the second meeting, then increased to 80% and 90% in cycle II. The achievement of cognitive learning outcomes also experienced a significant increase, with the number of students completing from 13 people (65%) in cycle I to 17 people (85%) in cycle II, so that the research success criteria were achieved. Thus, the application of the Discovery Learning model has proven effective in creating more meaningful learning, increasing student involvement and active participation, and providing a positive impact on science learning outcomes in elementary schools, indicating that this model is worthy of being implemented sustainably in daily learning.

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INTRODUCTIONS

Education is a key pillar in developing quality human resources . Law Number 20 of 2003 affirms that education is a conscious and planned effort to create a learning environment that enables students to actively develop their potential, including spirituality, self-control, personality, intelligence, and the skills necessary for social life. In line with social, cultural, political, and technological developments, the Indonesian education curriculum has undergone various changes, from the 1947 curriculum to the current Merdeka Belajar Curriculum. These changes were made to ensure education remains relevant to the demands of the times and able to address the various challenges facing the nation (Gulo 2022) .

The Independent Learning Curriculum (Merdeka Belajar) provides teachers and students with flexibility in implementing learning. It emphasizes student independence in learning, creativity development, and emphasis on essential material. Furthermore, the curriculum is structured into two main activities: intracurricular learning and the Pancasila Student Profile Strengthening (P5) project. One prominent subject within the Independent Curriculum is Natural and Social Sciences (IPAS), which integrates both science and social studies (Assyifa 2025) . This subject aims to equip students with critical thinking skills, inquiry skills, and a comprehensive understanding of natural and social phenomena (Difa et al. 2021) .

Sciences (IPAS) learning is designed to enable students to see the relationship between natural and social aspects as a mutually influencing entity (I Nyoman Sudirman and I Kadek Purnayasa 2024) . With an integrated approach, students are expected to understand environmental, social, economic, and cultural issues holistically. Furthermore, IPAS is oriented not only towards cognitive aspects but also towards developing scientific attitudes, social values, and higher-order thinking skills. Previous research (Ikhsani and Alfiansyah 2023) showed that the implementation of IPAS in the Independent Curriculum was perceived positively by teachers because it provided opportunities for creativity and innovation in learning. However, the effectiveness of this implementation still depends on the learning methods or models used by teachers in the classroom.

Observations at SDN 198/VI Ulak Makam Village show that the sixth-grade science learning process still faces various obstacles. Students tend to be passive, pay little attention to teacher explanations, and are reluctant to ask questions even when they have difficulty understanding the material. This low level of student engagement impacts learning outcomes, with only 30% of students achieving the Learning Objective Achievement Criteria (KKTP), while the remaining 70% have not. This fact indicates that science learning remains conventional, dominated by one-way communication, and has not been able to stimulate students' interest and motivation to learn. (Paryati 2025) This condition emphasizes the need for more innovative learning strategies that are able to activate students in the learning process.

One learning model deemed appropriate to these needs is *Discovery Learning* . This model emphasizes students' active role in discovering concepts through exploration, investigation, and independent drawing of conclusions (Aini et al. 2021) . According to (Martir et al. 2024) , *Discovery Learning* can foster curiosity, train critical thinking skills, and improve retention of learning materials. By directly involving students in the discovery process, learning is oriented not only towards information transfer but also towards knowledge construction. Several previous studies have demonstrated the effectiveness of *Discovery Learning* in improving learning outcomes. (Cantika 2025) found that the implementation of this model was able to increase student activeness in science learning. Similarly, (Puspita Indah 2024) reported a significant increase in student learning outcomes through the application of the *Discovery Learning model* in science and social studies subjects.

Although previous research has demonstrated the effectiveness of *Discovery Learning* , most of these studies have focused on either science or social studies subjects separately. Studies on its application to science, which integrates science and social studies within the Independent Curriculum, are still limited. Thus, an important research

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gap exists: the effectiveness of the *Discovery Learning model* in improving student learning processes and outcomes in science in elementary schools. This gap is relevant because science has unique characteristics that differ from both science and social studies, requiring an appropriate learning approach to achieve curriculum objectives.

Based on this background, this study focuses on the application of the *Discovery Learning model* to improve student learning processes and outcomes in science learning in grade VI of SDN 198/VI, Ulak Makam Village. This study aims to describe the increase in student engagement in the learning process and the improvement in learning outcomes obtained after the implementation of this model. Theoretically, the results of this study are expected to enrich studies on the effectiveness of innovative learning models in the context of the Independent Curriculum. Practically, this research is expected to serve as a reference for elementary school teachers in implementing more active, enjoyable, and student-centered learning strategies.

Recent research further reinforces the urgency of this study. For example, (Mutiara Sani, Moh. Rudini 2021) found that *Discovery Learning* effectively improves critical thinking skills and learning motivation in elementary school students in integrative subjects. Meanwhile, (Nasri et al. 2024) demonstrated that the implementation of project-based *Discovery Learning* in the Independent Curriculum significantly improved collaboration, creativity, and cognitive achievement in upper elementary school students. These findings confirm that *Discovery Learning* is relevant to addressing the challenges of science learning, thus deserving further research in real-world elementary school contexts.

METHOD

This study used a Classroom Action Research (CAR) design oriented toward improving and enhancing the quality of classroom learning processes (Difa et al. 2021) . CAR is viewed as a form of reflective study conducted by educators to identify problems, plan solutions, implement actions, and evaluate learning outcomes (Hermina 2025) . Through this approach, teachers act not only as facilitators but also as researchers who systematically strive to create more effective, active, and meaningful learning for students.

The research location was SD Negeri 198/VI Ulak Makam Village, with the research subjects being sixth grade students in the even semester of the 2024/2025 academic year. The number of students involved was 20 people, consisting of 10 male students and 10 female students. The research object focused on the application of the *Discovery Learning learning model* in the subject of Science with the aim of improving the learning process and student learning outcomes. The selection of sixth grade was based on the results of initial observations that showed low student engagement in learning and learning outcomes that were still far from the Learning Objective Achievement Criteria (KKTP).

This research was designed in two learning cycles. Each cycle consisted of four stages: planning, action implementation, observation, and reflection. In the planning stage, the researcher prepared learning tools in the form of a Lesson Implementation Plan (RPP), observation instruments, and learning outcome test questions that were in accordance with the learning outcomes of the Natural Sciences (IPAS) subject. (Budiastuti and Rosdiana 2023) *The* implementation of the action was carried out by applying the steps of the *Discovery Learning model* , including stimulation , problem statement , data collection , data *processing* , verification , and generalization . (Yetni 2021) Observations were carried out collaboratively with the class teacher to monitor student and teacher activities during the learning process. Meanwhile, reflection was carried out to analyze the results of the actions in the cycle that had been implemented as a basis for improvements in the next cycle.

Data collection was conducted through three techniques: tests, observation, and documentation (Utomo et al. 2024) . A 20-item written test was used to measure students' cognitive achievement after learning. Observation sheets were used to assess student engagement and the quality of teacher learning implementation. Documentation in the

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form of photographs and field notes served as supporting data to record the research process. Data from observations and tests were then analyzed descriptively using quantitative and qualitative methods. Quantitative analysis was used to calculate the percentage of student learning achievement, while qualitative analysis was used to describe student activities and obstacles encountered during the learning process.

The indicators of success of this research are determined based on two aspects, namely the process and learning outcomes. From the process aspect, the research is said to be successful if student involvement in learning reaches a minimum of 75% with a good category. From the outcome aspect, the research is considered successful if at least 75% of students obtain a score of ≥ 70 according to the KKTP. Thus, through the application of the *Discovery Learning model* , it is expected that there will be an increase in both the quality of the learning process and the achievement of student learning outcomes in the subject of Science in class VI of SD Negeri 198/VI Ulak Makam Village. The following are the criteria for the level of success in this research.

Table 1 success rate

Mark	Criteria	Percentage
90 - 100	Very high	86% - 100%
80 - 89	Tall	71% - 85%
70 - 79	Enough	56% - 70%
60 - 69	Low	41% - 55%
≤ 60	Very Low	≤ 40%

RESULTS AND DISCUSSIONS

Teacher Observation Sheet Results

Table 2 Percentage Improvement Sheet Observation Teacher

Cycle	**Average Percentage**
Cycle I Meeting I	64.28%
Cycle I Meeting 2	78.57%,
Cycle II Meeting I	85.71%
Cycle II Meeting 2	92.85%

Based on the data in Table 1, there is an increase in teacher performance from cycle I to cycle II. In the first meeting of cycle I, the percentage of teacher performance achievement reached 64.28 % , then increased in the second meeting to 78.57%. In cycle II, there was a more significant increase, namely 85.71 % in the first meeting and reaching 92.85% in the second meeting. This increase indicates that teachers are increasingly skilled in implementing *Discovery Learning* steps , managing classes, and providing more effective guidance. This also proves that there is continuous improvement from cycle to cycle, where teachers are able to adjust learning strategies so that the teaching and learning process runs more conducive and directed.

This improvement occurred because teachers were able to implement science lessons using the Discovery Learning model as expected. The increase in the percentage of students on the teacher observation sheet using this learning method was due to teachers' ability to effectively implement the Discovery Learning steps in accordance with the lesson.

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Student Observation Sheet Results

Table 3 Percentage Observation Sheet Student

Cycle	Average Percentage
Cycle I Meeting I	45%
Cycle I Meeting 2	65%
Cycle II Meeting I	80%
Cycle II Meeting 2	90%

Based on the data in Table 2, student activity also experienced a significant increase. In the first meeting of cycle I, the percentage of student engagement only reached 45%, then increased to 65% in the second meeting. In cycle II, student engagement increased even higher, reaching 80% in the first meeting and increasing again to 90% in the second meeting. This increase indicates that the implementation of *Discovery Learning* is able to encourage students to be more active in learning activities, both through group discussions, asking questions, expressing opinions, and completing assigned tasks. Students are not merely passive listeners, but are directly involved in the process of discovering knowledge.

Student Learning Outcomes

Table 4 Results Test Study Students' Science Cycle I and Cycle II

Implementation of Action	Completeness		Percentage (%)	
	Completed	Not yet complete	Completed	Not yet complete
Cycle I	13	7	65%	35 %
Cycle II	17	3	85%	15 %

Based on the test results presented in Table 3, student learning achievement also increased from cycle I to cycle II. In cycle I, 13 students (65%) were declared to have completed the learning objectives, while 7 students (35%) had not yet achieved the KKTP. In cycle II, the number of students who completed the learning objectives increased to 17 students (85%), while only 3 students (15%) had not yet achieved the KKTP. This 20% increase indicates that the implementation of the *Discovery Learning model* not only increased learning activities but also had a positive impact on students' cognitive achievement. Several obstacles were encountered during each cycle. In cycle I, some students remained confused during the initial discovery stage, especially when observing phenomena or formulating investigative questions, requiring additional guidance from the teacher. Some students also had difficulty summarizing their observations. In cycle II, these obstacles began to diminish, but some students still needed more time to discuss and express their ideas clearly. These obstacles became material for teacher reflection to improve strategies, for example by providing guiding questions, organizing more structured group discussions, and utilizing learning media so that students could understand the science material more actively and effectively.

Discovery Learning model has been proven effective in improving learning quality—the learning process is in the "good" category (≥ 75%) and classical cognitive completion reaches ≥ 70%. This supports the finding that the implementation of Discovery Learning can foster curiosity, train critical thinking skills, and strengthen students' conceptual understanding (Ummu Salamah 2025) . The results of this study are also consistent with the view (Prijanto and Kock 2021) which emphasizes that active student involvement has a positive effect on learning outcomes. Thus,

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Discovery Learning is worthy of being used as an alternative active learning strategy in elementary schools, especially in science subjects, because it encourages students to be directly involved in the process of discovering knowledge and building meaningful understanding that emphasizes active student roles through thinking, discussion, reflection, and problem-solving.

CONCLUSION

Discovery Learning model has been proven effective in improving the quality of the science learning process for sixth-grade students of SDN 198/VI Ulak Makam Village. This improvement can be seen in the results of teacher and student observations from cycle I to cycle II. Based on teacher observations, the learning process in the first meeting of cycle I reached 64.28 % and increased to 78.57% in the second meeting. In cycle II, the percentage of teacher performance achievement increased again to 85.71 % in the first meeting and reached 92.85% in the second meeting. Meanwhile, based on the results of student observations, their involvement in the first meeting of cycle I was only 45%, then increased to 65% in the second meeting. In cycle II, student involvement increased significantly, namely 80% in the first meeting and reached 90% in the second meeting. This increase shows that the *Discovery Learning model* has succeeded in encouraging students to be more active in learning activities, both in discussions, asking questions, and expressing opinions.

In addition to improving the quality of the learning process, the implementation of *Discovery Learning* also has a positive impact on students' cognitive learning outcomes. Based on the evaluation test, in cycle I, 13 students (65%) achieved mastery, while 7 students (35%) did not. In cycle II, the number of students who completed the course increased to 17 students (85%), while only 3 students (15%) did not. Thus, there was a 20% increase in learning mastery from cycle I to cycle II. Through this classroom action research, learning obstacles both in terms of process and results can be minimized. Teachers are increasingly skilled in managing learning, while students are increasingly actively involved and independent in discovering concepts. These results prove that the implementation of the *Discovery Learning* model is effective in creating more meaningful learning while meeting the predetermined success indicators.

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