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Elementary School Students' Motivation to Learn Science Through Discovery Learning Models

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Abstract
This study aims to improve the self-development of students by increasing student activity in learning. The research conducted was classroom action research (CAR) and it was carried out in two cycles. The stages carried out in each cycle consisted of planning, implementation of actions, observation of actions, and reflection. The research subjects were fourth-grade elementary school students. Data collection techniques included observation, interviews, document review, tests, and questionnaires. The analysis technique used was descriptive qualitative. The results of this study indicate that the use of the Discovery Learning model is capable of increasing student learning activity, improving student self-development, improving academic learning outcomes, and increasing the effectiveness of learning strategies in CAR. Teachers also gained direct experience in reflecting on learning, helping students to be more courageous and confident in the learning process. That classroom action research (CAR) is effective in solving real learning problems in the classroom and encourages teacher competency improvement programs through CAR to improve the quality of learning.

Keyword: Students_Motivation; Science_subject; Discovery_Learning

1. Introduction

Natural Sciences (IPA) is one of the essential subjects taught at the elementary school level. As a branch of science education, IPA provides students with opportunities to explore the natural world, understand its phenomena, and apply scientific concepts in daily life. Beyond its cognitive contribution, science learning also supports the development of technological literacy, critical thinking, and problem-solving skills, which are crucial for students in facing future challenges.

Nevertheless, science learning in elementary schools often faces obstacles, particularly in terms of student activity and motivation. Often, students tend to be passive in the learning process, relying solely on the teacher's explanations without actively engaging through questions, discussions, or opinions. Even when we conduct group-based and field learning activities, the results are often unsatisfactory. The impact of these issues can be seen in student achievement, where around 60% of students score below the minimum mastery standard of 75, with scores ranging from 25 to 70.

To address these challenges, the Discovery Learning model has emerged as a promising alternative approach. Discovery learning emphasizes student-centered exploration, where learners are encouraged to discover concepts, principles, and relationships through active involvement in the learning process. By engaging students directly in constructing their own understanding, this model has the potential to foster curiosity, increase participation, and strengthen motivation.Learning motivation is an encouragement for someone to be more active in achieving something [1]. Science learning in elementary schools aims to enhance students' understanding of science and its application in daily life, ultimately fostering positive attitudes toward problem-solving within their community [2]. However, in practice,

science education often faces obstacles. Students tend to be passive in the learning process and are not actively involved, either in group discussions or in answering teachers' questions [3]. Such behavior has an impact on the low achievement of student learning outcomes, many of which are below the minimum passing standard.

Student Learning motivation is needed in learning activities. Motivation during schooling is highly related to a student's later academic achievement, and it is therefore very important to encourage it [4]. Teachers are required to facilitate the effectiveness of student interaction in the classroom. In addition, they are also expected to function as motivated students are easier to develop thinking skills so that the learning outcomes achieved are better [5]. Learning motivation is also needed to improve science learning outcomes, which are not just memorizing a number of facts; for that we need encouragement from oneself and others to make a comprehensive attitude change that is integrated through knowledge and skills [6] motivation plays an important role in determining the success of students in participating in learning According to [7].

learning motivation includes the needs, drives, and goals that encourage students to learn. Meanwhile, adds that motivated students are characterized by a strong desire to learn, discipline, willingness to sacrifice other activities, and perseverance in completing tasks. Low student motivation in science subjects leads to reduced involvement in learning activities. Students tend to simply accept the knowledge provided by teachers without active interaction, such as asking questions or giving opinions. Therefore, a learning approach is needed that can increase student motivation to be more active, creative, and courageous in the learning process.

Discovery Learning: Model Discovery learning is a learning model that emphasizes student activities for discovering concepts through direct learning experiences (Bruner, 1961). In discovery learning, teachers act as facilitators who guide students to explore, ask questions, and draw conclusions based on observations. Bruner suggested and researched this aim and improved our understanding of knowledge construction through symbolic representations, scaffolding, and discovery. His ideas led to the movements of 'learn how to learn' and 'learning by doing,' which are still pivots in science education. This chapter will guide the readers with suggestions for using discovery learning in science teaching [8]. According to Riska (2025), the application of discovery learning can help improve students' critical thinking skills, build confidence, and foster motivation to learn because students feel more actively involved. Research conducted by [9] also shows that discovery learning can increase student activity in the science learning process in elementary schools, especially in terms of courage to ask questions, discuss, and express opinions. Design learning approaches that not only emphasize academic achievement but also character formation that is in line with religious values, creating holistic growth for students [10]. Relevance of Research Based on a literature review, low motivation and activity among students in science learning is a real problem in elementary schools. The Discovery Learning model is considered relevant to be applied because it can provide meaningful learning experiences, increase student interaction, and foster learning motivation. This study is expected to contribute to the development of more effective science learning strategies at the elementary school level.

Relevance of Research: Based on a literature review, low motivation and activity among students in science learning is a real problem in elementary schools. We consider the Discovery Learning model relevant for application, as it offers meaningful learning experiences, enhances student interaction, and cultivates learning motivation. This study is expected to contribute to the development of more effective science learning strategies at the elementary school level.

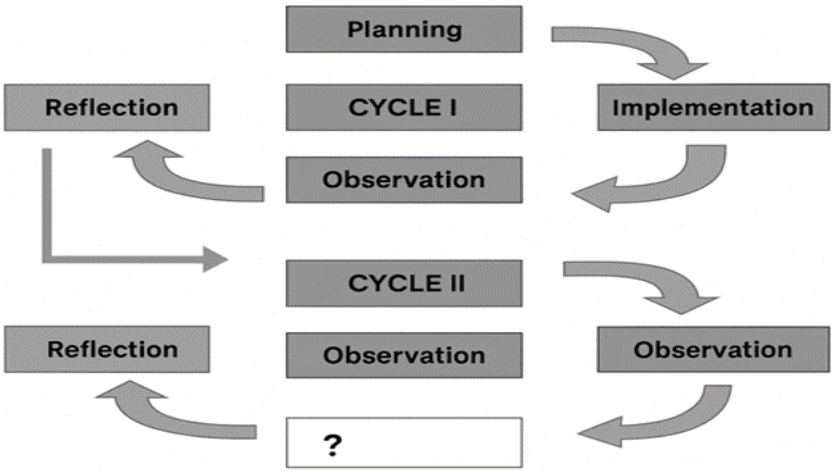

Figure 1: The model of Classroom Action Research (CAR)

Students with strong motivation demonstrate a willingness to prioritize learning, maintain discipline, and persist in completing tasks despite obstacles. Therefore, integrating discovery learning with a focus on enhancing motivation is expected to improve both the learning process and outcomes in science education at the elementary level. Based on the objectives, this study attempted to answer the following research questions:

RQ1: Can the discovery learning model be used to improve student motivation in science learning? Based on these considerations, this study aims to investigate how the Discovery Learning model can be used to improve student motivation in science learning and address the problems commonly encountered in elementary schools.

2. Methodology

Data collection techniques included observation, interviews, document review, tests, and questionnaires. The analysis technique used was descriptive qualitative. a) Type of Research This study used Classroom Action Research (CAR) with the Kemmis & McTaggart model, which consists of four stages: planning, implementation of actions, observation, and reflection. CAR was chosen because it is suitable for continuously improving the learning process in the classroom. b) Research Subjects and Location The research subjects were 15 fourth-grade students at Muhammadiyah 1 Elementary School in Palopo City. The research was conducted in the even semester of the 2024/2025 academic year. c) Research Design The research was conducted in two cycles, each consisting of (1) Planning: Developing a lesson plan using the Discovery Learning model and preparing research instruments (observation sheets, motivation questionnaires, and learning outcome tests). (2) Action Implementation: Implementing science learning by applying the Discovery Learning model according to plan. (3) Observation: Observing student activities and teacher performance during the learning

process. (4). Reflection: Analyzing the results of observations and tests to improve planning for the next cycle. d) Data Collection Techniques Research data was collected through several techniques: Observation: To determine student activity in the science learning process. Learning Motivation Questionnaire: To measure student motivation levels before and after the intervention. Learning Achievement Test: To determine student cognitive achievement in the science material taught. Documentation: Collecting supporting data such as student grades, photos of activities, and field notes.

Research Instruments: Student activity observation sheets cover indicators of activity, courage to ask questions, express opinions, and group cooperation. The learning motivation questionnaire uses a Likert scale based on learning motivation indicators (willingness to learn, discipline, perseverance, and focus). the learning outcome test comprises multiple-choice and essay questions that align with the basic science competencies taught. Data Analysis Techniques The data obtained was analyzed using quantitative and qualitative descriptive analysis techniques: Quantitative analysis: Calculating the average learning motivation score, learning outcome scores, and the percentage of student learning completeness compared to the minimum passing grade (75). Qualitative analysis: Describing changes in student behavior in the learning process from observation results and field notes. Success Indicators The research is considered successful if: Students' learning motivation increases at least to the high category based on the motivation questionnaire. The percentage of students who achieved a minimum passing grade of 75 increased to at least 85% of the total number of students. Student activity in science learning increased in each cycle.

Figure 2: The proposed research model

3. Result and Discussion

3.1. Result

Table 1. Students' Learning Outcome Cycle 1

NO	STUDENT NAME	SCORE	MASTERY
1	Amiratul Izza	50	Not Achived
2	Khalifah	55	Not Achived
3	Kayla Nursyam	70	Achived
4	Kanza Gina	75	Achived
5	Muh.Ahyan Hafid	100	Achived
6	Muh.Rifki	75	Achived
7	Muh.Razka Al Fatih	76	Achived
8	Mugnhni Fatihan	80	Achived
9	Najwa	80	Achived
10	Naila	80	Achived
11	Rumasih Ahmad	70	Achived
12	Haikal	70	Achived

13	Sakia	80	Achived
14	Rakha	55	Not Achived
15	Zahra Nindia	56	Not Achived
	Total Score	1072	
	Avarage Score	71,5	

3.1.1 Cycle I

- Average class score: 71.5
- Number of students: 15
- Students who passed (≥75): 11 (73.3%)
- Students who did not pass: 4 (26.6%)

Findings:

- Students were still passive, with some not paying attention.
- Some students cheated when doing the questions.
- Teachers are not maximizing their efforts to motivate students.
- Time management is not effective.

3.1.2 Cycle II

- Improvements made: use of media (videos), more intensive motivation, provision of group worksheets, and evaluation with a higher level of difficulty
- Observation of teacher and student activities: classified as "excellent," meaning that student involvement has increased significantly.

3.1.3 Comparison of Cycle I and II

- Student motivation increased: from passive to active (daring to discuss, answer, and ask questions).
- Student activity in groups improved; no one was just telling stories or not paying attention anymore.
- Learning outcomes improved significantly, the class average score increased, and classical learning completeness reached the target (≥85%).

Figure 4. Comparison of Students' Learning Outcomes Between Cycle I and Cycle

No	Student Name	Score (Cycle I)	Mastery (Cycle I)	Score (Cycle II)	Mastery (Cycle II)
1	Amiratul Izza	50	Not Achieved	70	Achieved
2	Khalifah	55	Not Achieved	75	Achieved
3	Kayla Nursyam	70	Achieved	80	Achieved
4	Kanza Gina	75	Achieved	85	Achieved
5	Muh. Ahyan Hafid	100	Achieved	100	Achieved
6	Muh. Rifki	75	Achieved	85	Achieved
7	Muh. Razka Al Fatih	76	Achieved	85	Achieved
8	Mugnhni Fatihan	80	Achieved	90	Achieved
9	Najwa	80	Achieved	85	Achieved
10	Naila	80	Achieved	90	Achieved
11	Rumasih Ahmad	70	Achieved	80	Achieved
12	Haikal	70	Achieved	80	Achieved
13	Sakia	80	Achieved	85	Achieved
14	Rakha	55	Not Achieved	75	Achieved

15	Zahra Nindia	56	Not Achieved	76	Achieved
	Total Score	**1072**		**1226**	
	Average Score	**71.5**		**81.7**	
Students Achieving Mastery (≥75)		**11 students (73.3%)**		**13 students (86.7%)**	

Conclusion of Results: The Discovery Learning model has proven effective in increasing learning motivation, student activity, and science learning outcomes in the fourth grade at SD Muhammadiyah 1 Palopo and Consistent implementation with improvements in each cycle has been able to change the learning pattern from passive to active, collaborative, and meaningful.

3.2. Discussion

In this section, authors must answer "what the obtained results mean and are recognized as research findings." This section may seem easy to write but is the most challenging part to get right, and it is the most important part of an article. Most manuscripts receive serious attention from editors and reviewers because their discussion is weak, and many are even returned for resubmission or rejected. In this discussion section, authors need to create a "discussion" that fits with the presented research findings but does not repeat them. Authors need to compare the study's results with previous research findings (some of which are mentioned in the introduction). Perhaps the research results clarify, enhance, or even contradict previous research findings. Whatever the results, authors must engage in a "dialogue" with the findings of other researchers based on existing major theories. If the findings turn out to be different from those of others, this may be extraordinary, and in turn, authors must address it and convince readers that these findings are correct or better than before. Although this truth sometimes does not last long, as it will be refined with new truths reported by other researchers. That's how science works.

4. Conclusion

The results showed an increase in student motivation, activity, and learning outcomes in science learning through the application of the Discovery Learning model. In cycle I, the average score of new students reached 71.5 with a classical mastery of 73.3%, which did not meet the predetermined success indicator (≥85%). This conclusion is in line with the observation results, which show that some students are still passive, do not pay attention to the teacher, and are not accustomed to expressing their opinions or answering questions. Teachers should improve how they motivate students and manage learning time. However, after improvements were made in cycle II through the use of learning media (videos), the provision of group worksheets, and increased student motivation, learning outcomes improved significantly. The average student score rose to 82 with a classical mastery level of 86.7%. In addition, student activity in the learning process also increased, as indicated by their courage to ask questions, discuss, and express their opinions in groups and in front of the class. These findings reinforce Bruner's (1961) opinion that the Discovery Learning model is effective in increasing student engagement, as students are guided to discover concepts through direct experience. The results of this study are also in line with [11], who state that

discovery learning can increase learning motivation and science learning outcomes in elementary school students. Thus, the application of the Discovery Learning model not only has a positive impact on students' academic achievement but also shapes scientific attitudes, courage, and social skills through group discussions. This shows that learning that emphasizes active student involvement is more effective than conventional lecture-based learning models.

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