p-ISSN 2085-7411
e-ISSN 2623-0380

Improving Elementary School Students' Learning Outcomes Through the Implementation of the Discovery Learning Model

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Abstract

This research aims to improve students' academic achievement in Catholic Religious Education. The study involved fourth-grade students of SDN Mananga Aba. The study used Classroom Action Research. Multiple-choice test questions were used as data collection instruments. Data analysis included descriptive analysis (i.e., individual completion, class completion), analysis of observation results of teacher and student activities. The results showed an increase from cycle I to II, both in the percentage of class completion (33 to 92) and the average value (63 to 85), as well as the average teacher activity (65 to 97) and students (96 to 96). These achievements indicate that discovery learning improves student learning outcomes. This increase occurred because the researcher made improvements to learning in Cycle II, especially in the teacher's ability to apply discovery learning syntax, and was supported by increased student initiative, motivation, and collaboration during the learning process. The findings of this study have important implications for teachers. They should make greater use of innovative learning models, especially discovery learning, to improve the quality of the learning process and the achievements of elementary school students in Catholic Religious Education.

Keywords: Discovery learning, learning outcomes, Catholic religion, elementary schools.

Received: April 29, 2025 Revised: May 5, 2025
Accepted: June 18, 2025

Article Identity:
Daga, A. T., Malo, M., & Sene, M. (2025). Improving Elementary School Students' Learning Outcomes Through the Implementation of the Discovery Learning Model. *Jurnal Ilmu Pendidikan (JIP) STKIP Kusuma Negara*, 17(1), 56-67.

INTRODUCTION

The teaching and learning process is the implementation of the lesson plan designed by the teacher. In this implementation, the role of the teacher is crucial in creating and developing learning activities. The teacher's responsibility goes beyond simply delivering the material; they must also motivate students and serve as a positive role model in accordance with their area of expertise (Conradty & Bogner, 2020; Sanusi et al., 2020; Ghamrawi et al., 2024). Teachers have a strategic role in guiding students to internalize values that shape self-identity, ethical foundations, and patterns of social interaction, both in the context of life in the school environment and in their contribution to community life in the long term (Sari et al., 2025). A learning plan is a document that details the objectives, content, methods, and assessments to be applied in the learning process. This planning serves as a guide that directs the course of the teaching and learning process, where both the teacher and students carry out the steps that have been outlined, starting from the opening,

the core activities, to the closing (Botchwey & Umemoto, 2018; Abidah et al., 2020).

The implementation of teaching involves activities that support the achievement of learning objectives, such as the use of media, approaches or methods, and assessments to measure learning success (Hamid et al., 2020; Ilmi et al., 2021). The implementation of teaching is the practical application of what has been planned, ensuring that learning objectives are achieved effectively and efficiently (Simamora, 2020; Tamsah et al., 2021). The lesson plan is not merely a theoretical document, but is translated into actions carried out in the classroom (Flores & Gago, 2020).

Based on the observations conducted by the researcher at SDN Mananga Aba, particularly in the fourth-grade class, it was found that during the religious education lessons, students tended to hesitate to ask questions even when they encountered difficulties or did not understand the material being presented. Despite the teacher providing opportunities for questions, students appeared to struggle with staying focused during the lesson. Additionally, the motivation and interest of the students in religious education seemed to be low, with some students exhibiting irregular attendance in class. It was apparent that the learning activities were predominantly dominated by teacher explanations, followed by question-and-answer sessions and assignments for the students. This one-way teaching approach led to passive student engagement, where students merely received the material and took notes without active participation in the learning process (Vokić & Aleksić, 2020; Sumendra, 2021). The emerging issues have become obstacles that hinder the achievement of the Catholic Religious Education learning objectives at SDN Mananga Aba, ultimately affecting students' learning outcomes.

In light of these issues, it is evident that steps to integrate active learning models into the teaching process are essential. Various teaching models are available, most of which have the potential to enhance Catholic Religious Education learning outcomes. Discovery learning can serve as an effective solution to improve student achievement. This model is implemented to encourage active learning through investigation and discovery by the students themselves, ensuring that the learning outcomes are more durable and retained in students' memory (Prasetya & Harjanto, 2020; Karan, 2023).

According to Jerome S. Bruner as quoted by Surgah (2019), discovery learning is a learning approach that places students as active subjects in gaining knowledge through independent exploration and discovery processes, not through direct delivery by teachers. In line with that, Robert B. Sund as quoted by Rahayu & Mustika (2021) stated that this approach directs students to discover scientific concepts and principles through activities such as observation, classification, measurement, prediction, and experimentation. In line with this view, Robert J. Marzano as quoted by Hosnan (2014) stated that discovery learning can encourage the development of high-level thinking skills because it requires students to analyze, evaluate, and formulate solutions independently in the learning process. In this context, discovery learning helps students understand the content to be learned by obtaining information independently, while also facilitating the construction of the knowledge they have acquired (Simamora, 2020; Siregar et al., 2020), while increasing student creativity (Utomo et al., 2024), which is a very important ability both in the learning process and in solving everyday life problems (Lavli & Efendi,

2024). Therefore, as a solution to the challenges in teaching, teachers can apply the discovery learning model, which not only serves to activate students but also stimulates their creativity and helps enhance their religious knowledge at the elementary school level (Chusni et al., 2021).

Several studies have shown the effectiveness of discovery learning compared to expository patterns in influencing student learning outcomes, such as improving 21st-century skills (critical thinking, communication, collaboration, creativity), even though the communication aspect is higher with the expository method (Putra et al., 2020). What is different in this study is the focus, namely, the cognitive learning outcome score. The mixed-method study using discovery learning showed 14 students in the High category, 38 students in the medium category, and 14 students in the low category. Qualitatively, this study found that the discovery learning method encourages students to engage in active and independent learning and shows high enthusiasm in seeking learning resources (Chusni et al., 2021). What is different in this study is the focus on Catholic Religion subjects and the use of quasi-experimental methods.

A literature study examining the implementation of the Discovery Learning model at the elementary school level concluded that this approach contributed significantly to improving critical thinking skills and student learning achievement. This improvement occurred through the process of integrating critical thinking into learning practices that were in line with the demands of 21st-century learning (Kurniawati et al., 2021). Unlike this study, the current research does not use statistical testing but focuses on analyzing the improvement in students' learning outcomes. A different quasi-experimental study comparing student learning outcomes between discovery learning and other models found the effectiveness of the discovery learning model. The findings of this study were reinforced by hypothesis testing that showed a significant difference in student achievement between the two teaching models. Descriptive data also revealed that students using discovery learning achieved a score of 84.5, while students engaged in inquiry learning scored 78.9 (Lukitasari et al., 2020).

Another study using a literature review method described the impact of discovery learning on elementary school students' mathematics learning outcomes. Interestingly, in this study, each step in the discovery learning process showed different effects on various aspects. For example, the problem formulation stage was found to have significant potential in enhancing students' observation skills, motivation, and critical thinking. Meanwhile, the verification phase was shown to foster skills in drawing conclusions, communication, and group discussions (Kamaluddin & Widjajanti, 2019). However, unlike this study, the present research focuses on the application of discovery learning within classroom action research to improve students' academic achievement.

This study is focused on a scientific examination of the use of discovery learning to enhance students' academic achievement in Catholic Religious Education in fourth-grade elementary school classes. This research can broaden the perspective for Catholic Religious Education teachers. Although this subject has its distinctive teaching methods, such as the catechetical method, this study offers discovery learning as a solution-oriented alternative to facilitate student engagement while simultaneously improving their learning outcomes.

RESEARCH METHOD

This study involves 12 students from the fourth-grade class of SDN Mananga Aba, located in Loura District, Southwest Sumba Regency, East Nusa Tenggara Province, Indonesia. In this context, a classroom action research design (Liana & Hasibuan, 2024) was applied, based on the cycle model described by Kemmis and McTaggart, as cited by Putra et al. (2022) which consists of four stages as shown in Figure 1 below.

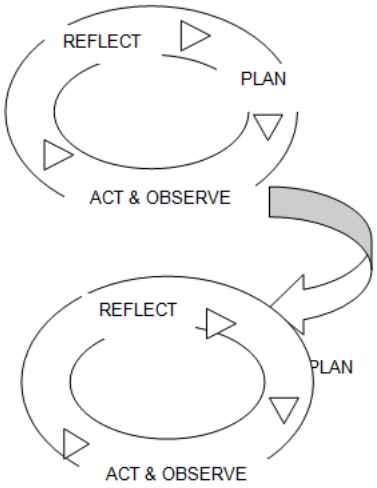

Figure 1. Classroom action research cycle by Kemmis and McTaggart

In the planning phase, the researcher developed lesson plans, organized teaching materials, designed worksheets, created test items for cycles I and II, and prepared observation sheets for both teachers and students. In the implementation phase, the researcher practiced discovery learning for 2 cycles, where each cycle included two learning processes. After the implementation of the cycle, students took a learning outcome test to determine their learning achievements. Observation activities were conducted to monitor the teacher's application of discovery learning and to observe student activities during the learning process. Reflective activities were carried out to evaluate, analyze, interpret, and draw conclusions from the teaching process, serving as a basis for planning actions in the subsequent cycle.

The application of discovery learning refers to the framework proposed by Veermans, as quoted by Fahmi et al. (2019), which includes providing orientation to students, helping students formulate hypotheses, facilitating students to test their hypotheses, encouraging students to conclude, and determining regulations. The research data were collected through observation and tests. The observation technique was used to evaluate the quality of the activities of both the teacher and students during the discovery learning process. The instruments used for observation included observation sheets, provided for both teacher and student activities. Learning outcomes were measured using a test technique, consisting of multiple-choice questions, which were administered at the end of each cycle, with 10 questions in each cycle.

The analysis of student learning outcomes includes individual student completeness analysis, class completeness analysis, as well as the analysis of the teacher's implementation of discovery learning and student activities in processing the learning material. The analysis of observation data on teacher and student

activities, along with the individual student completeness analysis, uses the formula proposed by Suherman (2021) as follows.

$$\text{Mastery} = \frac{\text{Obtained Score}}{\text{Maximum Score}}\ x\ 100 \quad \text{(Suherman, 2021)}$$

The criteria for evaluating the results of teacher and student observations are based on the table provided by Usman et al. (2017), as shown in the table below.

Table 1. Criteria for observation results assessment

Score Range	Category	Qualification
88-100	Very good	Successful
67-87	Good	Successful
46-66	Fair	Not successful
25-45	Poor	Not successful

The class completeness analysis for each cycle is carried out using the formula proposed by Rosna (2018), as follows:

$$\text{Class Mastery} = \frac{\text{Number of Students Mastered}}{\text{Total Number of Students}}\ \text{x } 100\% \quad \text{(Rosna, 2018)}$$

The success indicators are formulated as follows: Students are considered to have achieved learning mastery if they score ≥ 75. The study is considered successful on a class level if 90% of the students achieve this score, and the results of the observations fall within at least the good category.

RESULTS AND DISCUSSION

This research was conducted in two cycles. The theme in Cycle I was "I Am Proud to Be a Man or a Woman and Respect the Belongings of Others," while the theme in Cycle II was "Being Grateful as a Man or a Woman with Abilities and Limitations." The increase in student learning achievement is presented in Table 2 below.

Table 2. Learning Outcomes

Cycle	Complete	Percentage	Highest score	Lowest score	Mean
I	4	33	90	40	63
II	11	92	100	60	85

Based on Table 2 it can be seen that in Cycle I, only 33% of students achieved a score of ≥ 75, with a mean score of 63 and the highest score reaching 90. In contrast, in Cycle II, the percentage of students achieving a score of ≥ 75 significantly increased to 92%, with a mean score of 85 and the highest score reaching 100. Thus, a significant increase occurred from cycle I to II in both the percentage of completion and the average value. The percentage of completion in cycle I was only

33%, increasing to 92% in cycle II, as well as the average value in cycle I of 63 to 85 in cycle II. This means that in cycle I, only one-third of students achieved the success criteria, while in cycle II, almost all students succeeded in meeting the established success criteria.

Table 3. Student Activities

Cycle	Score	Category
I	63	Fair
II	96	Very good

Based on Table 3 the student activity scores in discovery learning for Cycle I and Cycle II were 63 (categorized as Fair) and 96 (categorized as Very Good), respectively. According to the success indicators, the category of student activity success was achieved in Cycle II. The improvement in student activity scores from Cycle I to Cycle II indicates that the discovery learning approach implemented by the teacher became more effective, and students became more engaged in the learning process.

Table 4. Teacher Activities

Cycle	Score	Category
I	65	Fair
II	97	Very good

Table 4 shows that the teacher's activity scores in implementing discovery learning in Cycle I and II were 65 (categorized as Fair) and 97 (categorized as Very Good), respectively. Based on the success indicators, the teacher's activity was deemed successful in Cycle II. The teacher's activity score in Cycle I falls within the fair category, indicating that the teacher's activities in applying the discovery learning approach were considered sufficient, though there is still room for improvement. The teacher's activity score in Cycle II increased to the very good category, meaning that after the first cycle, the teacher made progress in managing the learning process and successfully implemented discovery learning more effectively.

The purpose of this research is to improve the academic achievement of elementary school students in Catholic Religious Education. The results achieved by students show an increase in both the average value and the percentage of class completion, as well as the average value of teacher and student activities, namely from the category of Fair to Very Good. This shows that discovery learning can encourage student understanding and active involvement in classroom activities. The increase is directly related to the characteristics of discovery learning, which makes students active subjects in the process of constructing knowledge through exploration, observation, discussion, and independent problem-solving activities (Saputri et al., 2020; Ott et al., 2021; Febriana et al., 2023). The application of discovery learning in Catholic Religious Education helps students to explore knowledge of faith and strengthen morals reflectively and contextually, not just memorizing concepts (Hariyanto et al., 2023; Wahyuningrum et al., 2024).

This finding is supported by the results of relevant research that uses discovery learning, even though in different contexts and levels of education. Experimental research that examines the improvement of creative thinking in fifth-grade students shows that the average in the discovery learning class is higher than in conventional classes (Putra et al., 2020). Likewise, the same study in junior high schools showed that discovery learning was able to improve students' speaking skills in cycle II (Putra et al., 2022). This shows that this model is not only effective in improving cognitive learning outcomes, but also students' communication and self-expression skills. The same study in grade 7 showed that students' critical thinking can improve because students are facilitated to explore learning resources, increase cooperation, and also be independent in learning (Chusni et al., 2021). Although the levels are different, this is consistent with the findings of this study which show an increase in the ability to understand and evaluate religious values in more depth. Other Classroom Action Research in Natural Science subjects in grade XI of high school showed an increase in analytical thinking skills and science process skills, as well as students' creative attitudes through the application of the discovery learning model (Syolendra & Laksono, 2018). Meanwhile, a study using a literature study method that examined the results of classroom action research in elementary schools also concluded that the discovery learning approach generally contributed to improving learning outcomes, including in Mathematics (Kamaluddin & Widjajanti, 2019). This indicates that this approach is flexible and can be adapted in various subjects and levels of education to encourage better learning outcomes. Based on these findings, discovery learning strengthens student involvement, increases conceptual knowledge, and fosters critical thinking and communication skills. This model is very contextual to Catholic Religious Education learning because it encourages students to discover the meaning of Catholic faith teachings themselves through reflective and contextual learning experiences.

This study has several limitations that need to be considered in interpreting the findings and in applying the discovery learning model to a broader educational context. First, the study was only conducted in one class, namely grade IV, in one elementary school. This contextual limitation implies that the results obtained cannot be generalized to a wider population, considering the differences in student characteristics, learning environments, and school cultures in other places. Second, this study was limited to two cycles of action. Although there was an increase in learning outcomes from cycle I to cycle II, implementation in more cycles could potentially produce a deeper understanding and strengthen the validity of the findings related to the effectiveness of the discovery learning model. Third, the main focus of this study is limited to the cognitive domain, especially the achievement of the average value of students. Meanwhile, the affective and psychomotor aspects, which are also essential elements in Catholic Religious Education, have not received in-depth attention or exploration in this study. The development of spiritual values, moral attitudes, and social skills is very relevant in shaping students' character holistically. Fourth, the relatively short duration of the study was limited to 2 cycles in one semester. This limitation can affect the depth of the implementation of learning and the stability of the increase in students' academic achievement. Fifth, the success of the implementation of discovery learning also depends heavily on class conditions and teacher competence in designing and implementing learning. Factors such as pedagogical skills, classroom

management, and teacher readiness in implementing the constructivist approach greatly influence the effectiveness of the implementation of this model.

The findings in this study have several strategic implications that are relevant for stakeholders to consider in improving the quality of the learning process, especially in Catholic Religious Education in elementary schools. First, for elementary schools, the results of this study indicate that the application of the discovery learning model contributes significantly to improving student learning outcomes. Therefore, elementary schools can use these results as a basis for formulating learning policies that are more in favor of active, participatory, and constructivist approaches. Catholic Religious Education teachers need to integrate discovery learning into their teaching practices to support the improvement of the overall quality of the learning process and outcomes. Second, for the government of Southwest Sumba Regency to use these findings as a reference in formulating strategic policies and programs to improve the quality of elementary education. The results of this study emphasize the importance of organizing professional training and mentoring for teachers in implementing learning models that stimulate student learning activity and independence. The provision of training programs, learning innovation workshops, and the procurement of relevant supporting facilities need to be prioritized so that the discovery-based learning process can be effective. Third, for further researchers: This research provides ample space for the development of research with a broader scope, both in terms of the number of students, the number of action cycles, and the learning process. For further researchers, it is recommended to further explore the effectiveness of the discovery learning model not only from the cognitive aspect, but also the development of students' moral and spiritual values, which are the main focus in Catholic Religious Education. Further research also needs to conduct comparative studies of this model between levels of education or between learning models to gain a more comprehensive understanding of the effectiveness of learning approaches in various contexts.

The results of this study are contextual because they were conducted in one class (grade IV) in one elementary school with a limited number of cycles, namely two cycles. Thus, the generalization of the results of this study cannot be done statistically to the entire population of elementary school students. The findings of this study are not intended to represent all learning conditions in schools, but rather to provide an in-depth understanding of the effectiveness of discovery learning in a particular context. In classroom action research, generalization is more appropriately understood as analytical generalization, namely the application of findings to other situations or contexts that have similar characteristics (Lincoln & Guba, 1985; Miles et al., 2014). Therefore, these findings can be used as a reference by other educators or schools that have comparable student conditions, learning cultures, and environments. This finding is in line with recent research, such as that conducted by Durasa & Jelimin (2023), which shows that the discovery learning model is effective in improving learning outcomes in Catholic Religious Education in elementary school students. Research by Imen (2023) also supports that discovery-based learning can build students' conceptual understanding more deeply and contextually. However, to expand the reach of the findings and strengthen external validity, further studies are needed with a larger population, a variety of school settings, and a longer research period.

CONCLUSION

Discovery Learning model has proven effective in improving the learning outcomes of Catholic Religious Education among Grade IV students at SDN Mananga Aba. The effectiveness of this model is reflected in the significant increase between cycles I and II, both in student learning outcome scores and in the recapitulation of learning activities by teachers and students. The substantial increase in both learning outcomes and student involvement shows that discovery learning can create positive feelings in the learning process, such as feelings of joy and happiness, develop critical thinking skills, encourage active and independent exploration of knowledge, and strengthen cognitive process skills and lifelong learning abilities, facilitate meaningful knowledge construction and deeper understanding of learning materials. This condition is supported by the improvement in the quality of planning and implementation of discovery learning by teachers, especially in cycle II. The learning materials used have also been adjusted to the characteristics of the discovery learning model so that students can be actively involved at every stage of learning. Student participation that is optimally facilitated by teachers also contributes to the achievement of learning objectives effectively. The findings of this study are in line with the opinions of experts who state that discovery learning supports students to actively build knowledge through the process of scientific research and exploration, contributing to the development of high-level thinking skills because it involves students in analysis, evaluation, and formulation of solutions independently during the learning process. These findings also show that discovery learning can be applied as an effective learning strategy, not only in the context of Catholic Religious Education, but also in various subjects and levels of education, especially in fostering and developing higher-order thinking skills in students.

ACKNOWLEDGMENT

The researcher would like to thank the Head of Weetebula Catholic University for their support in implementing this research. Thanks, are also due to the Project Manager of Misereor-Indonesia for the facilitation and support that enabled this research to be completed and published. In particular, the researcher would like to express appreciation and gratitude to the teachers and students of SDN Mananga Aba for their contribution in supporting the success of this research.

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