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# Implementation of the Inquiry Learning Model to Improve Students' Science Learning Outcomes at MIS Arul Relem

**Kasidah**[1], MIS Arul Relem, Indonesia
**Erlina Putri** [2], MI Negeri 7 Aceh Tengah, Indonesia

## ABSTRACT

This research addresses the challenge of low student engagement and unsatisfactory achievement in Science (IPA) among fifth-grade students at MIS Arul Relem. The underlying issue identified was the passive learning approach, which contributed to low motivation and poor conceptual understanding. The study aims to determine the extent to which the application of the Inquiry Learning Model can effectively improve these Science learning outcomes. The research employed a Classroom Action Research (CAR) design, conducted over two sequential cycles. The participants were the entire population of fifth-grade students, totaling 25 individuals. Data collection instruments included a pre-test, post-tests for each cycle, and student and teacher activity observation sheets. The success criterion for the intervention was set at an 80% student mastery rate with a Minimum Completeness Criterion (KKM) score of 70. The results demonstrated significant improvement. In the initial pre-cycle phase, the class average score was 60, with only 40% of students achieving mastery. Following the implementation of the Inquiry Learning Model in Cycle I, the class average increased to 75, and the mastery percentage rose to 68%. By the conclusion of Cycle II, the class average reached 82, and the learning mastery dramatically surged to 88%, successfully surpassing the established success criterion. Furthermore, observation data confirmed a noticeable increase in student activity and enthusiasm during the learning process. In conclusion, the Inquiry Learning Model is proven to be a highly effective and appropriate strategy for enhancing Science Learning Outcomes and fostering active participation among fifth-grade students at MIS Arul Relem.

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***Corresponding Author:***

**Kasidah**
MIS Arul Relem, Indonesia
kasidahida4@gmail.com

## Introduction

Education is a key pillar in developing high-quality and competitive human resources in the era of globalization (Rahman et al., 2022). The strategic role of education extends beyond the transfer of knowledge to encompass the development of character, morals, and higher-order thinking skills relevant to the challenges of the 21st century. Therefore,

educational institutions, from elementary to higher education, hold a significant responsibility to provide a conducive and innovative learning environment. The quality of the learning process is the primary measure of the success of educational outcomes, which will ultimately determine the future of the nation.

Mastery of various skills, such as learning and adaptation, is an unavoidable requirement for students in the 21st century (Mardhiyah et al., 2021). These skills include collaboration, communication, creativity, and critical thinking, all of which must be integrated into the curriculum and daily teaching practices. One subject that plays a vital role in developing these skills is Natural Sciences (IPA). Science not only teaches theoretical concepts but also fosters a scientific attitude, observational skills, and analytical reasoning regarding natural phenomena. Science subjects in elementary schools serve as the initial foundation for students to systematically understand the world around them. With effective science learning, students are expected to be able to connect theory with practical applications in everyday life (Lubis et al., 2021).

However, the reality on the ground often shows a gap between curriculum expectations and student learning outcomes, including at MIS Arul Relem in particular. Preliminary data shows that fifth-grade students' science learning outcomes are still below the Minimum Completion Criteria (KKM). This low level of completion indicates that the learning process has not been able to optimally stimulate students' interest and motivation to learn. Interest and motivation have a significant impact on student learning outcomes, where the absence of either can hinder information absorption (Ricardo & Meilani, 2017).

This situation is exacerbated by a classroom atmosphere that tends to be passive, where students only receive one-way information from the teacher without being given adequate space for active discussion, exploration, or even innovation. The lack of varied media usage also contributes to this situation (Lubis & Dasopang, 2020). The main weakness in science learning in fifth grade at MIS Arul Relem is strongly suspected to stem from the dominance of conventional or lecture-based learning models. This approach lacks active student participation, preventing the process of constructing knowledge independently.

Therefore, learning innovations are needed that can shift the focus from teacher-centered to student-centered. Various efforts to improve learning outcomes have been attempted through active models such as Cooperative Learning (Lubis, 2019) or the implementation of educational games (Elisyah, et al., 2024). One learning model specifically designed to encourage students' mental and physical activity is the Inquiry Learning Model. This model emphasizes independent concept discovery through a series of investigative and experimental processes, starting from formulating problems to drawing conclusions.

The Inquiry Model is highly relevant for science subjects because it can enhance students' analytical thinking skills and train them to solve problems based on evidence (Lubis et al., 2021). The advantage of this model lies in its ability to foster scientific curiosity. The application of other active learning models, such as Problem-Based Instruction (PBI), has been proven effective in improving learning outcomes in different contexts (Putra et al., 2023). This strengthens the belief that the inquiry approach, which shares philosophical similarities, can also have similar positive impacts.

Based on the problem background and theoretical review of active learning models, this study focuses on efforts to improve science learning outcomes for fifth-grade students at MIS Arul Relem. The main objective of this study is to test and analyze the effectiveness of implementing the Inquiry Learning Model in addressing low student learning achievement. Given that the problem faced is a specific practical issue occurring in a particular classroom, the most appropriate type of research to use is Classroom Action Research (CAR) (Arikunto, 2002). PTK allows researchers to make improvements cycle by cycle while continuously measuring the improvement in the results achieved.

## Methods

This research is a Classroom Action Research (CAR). The selection of CAR was based on the primary objective of the research, which is to solve practical problems directly occurring in the classroom and to improve the quality of learning and student learning outcomes at MIS Arul Relem. CAR is reflective and collaborative, allowing researchers and teachers to work together in planning, implementing, and evaluating the interventions. This classroom action research was conducted at MIS Arul Relem. This location was chosen due to the specific problem of low science learning outcomes in fifth grade, as identified in the introduction. The subjects were all 25 fifth grade students at MIS Arul Relem. This selection of subjects was intended to ensure that the implemented actions had an impact and improved the entire class population.

This research used the CAR cycle model by Kemmis and McTaggart, implemented in two cycles, each consisting of four main stages: Planning, Acting, Observing, and Reflecting. The cycle will be terminated once the established success indicators have been achieved. In the planning stage, the researcher and the class teacher undertake several crucial activities. These activities include determining the science teaching materials to be used, developing a Lesson Implementation Plan (RPP) that systematically integrates the steps of the Inquiry Learning Model, and developing research instruments. The instruments prepared include learning outcome test questions (pre-test and post-test) and observation sheets for teacher and student activities.

The implementation and action stage is the direct implementation of the Inquiry Learning RPP in fifth grade. The teacher acts as the implementer of the actions according to the steps of the inquiry model, such as orientation, problem formulation,

hypothesis formulation, data collection, and conclusion formulation. Simultaneously, during the learning process, the researcher, assisted by an observer (a fellow teacher), conducts observations using a prepared observation sheet to record qualitative data regarding student activities and the teacher's management of the learning process.

The reflection stage is conducted after each cycle concludes. Data obtained from the post-test and observations are analyzed and evaluated to determine the weaknesses and successes of the actions taken. If the classroom learning outcomes do not meet the established success indicator targets, the plan for the next cycle (Cycle II) is revised to address identified deficiencies until the problem is resolved. The data collection technique in this study involved two types of instruments. First, tests were used to measure the cognitive aspects of student learning outcomes. These included a pre-test (to determine initial conditions) and a post-test at the end of each cycle (to measure improvement). Second, observations, in the form of structured observation sheets, were used to collect qualitative data regarding the implementation of the Inquiry Model steps and to measure student engagement and responsiveness during the learning process.

Student learning outcome data were analyzed using descriptive statistics techniques, including the percentage of individual and classroom completion. Individual completion was determined based on the Minimum Completion Criteria (KKM), which was 70. The study was declared successful if at least 80% of the total students achieved classroom completion. Observation data were analyzed qualitatively to provide an in-depth description of changes in classroom behavior and atmosphere.

## Result

This research began with a pre-cycle phase to map the initial cognitive abilities of fifth-grade students at MIS Arul Relem in science. Based on the results of the pre-test, which involved 25 research subjects, it was found that students' mastery of the material was still very low. Specifically, the average class score in the pre-cycle phase was 60. This figure is far below the school's Minimum Completion Criteria (KKM), which is set at 70. Classical completion data showed that only 40% of students (10 out of 25) successfully achieved or exceeded the KKM.

This condition indicates a fundamental problem in the current learning process, where students are not actively engaged in independently discovering science concepts. This low result is consistent with the finding that learning interest and motivation have a significant and interrelated impact on student learning outcomes (Ricardo & Meilani, 2017). To address this unsatisfactory pre-cycle condition, it was decided to implement the Inquiry Learning Model as an intervention. The inquiry model was chosen because of its focus on developing analytical thinking and problem-solving skills, which are crucial in the context of science learning (Lubis et al., 2021).

Cycle I was implemented with a focus on the basic steps of the Inquiry Learning model, including orientation, problem formulation, hypothesis formulation, and data collection through simple practical activities. Despite initial challenges in adapting students from a passive to an active learning model, collaboration between the research team and teachers ensured that the action steps were implemented according to the Lesson Implementation Plan (RPP).

Following the implementation of Cycle I actions, a post-test was conducted to measure improvements in learning outcomes. The results showed significant improvement compared to the pre-cycle. The average class score increased to 75, and the percentage of classical completion rose to 68% (17 out of 25 students). Despite the improvement, this 68% completion percentage still fell short of the established success indicator of 80% or more. This less-than-optimal success aligns with other research findings showing that changing learning methods requires gradual adaptation from students, although active methods such as Cooperative Learning have proven effective in elementary education contexts (Lubis, 2019).

Qualitatively, observations showed an increase in student engagement. Students began to show enthusiasm in groups and were more willing to ask basic questions during the problem formulation stage. However, it was noted that the effectiveness of group interactions still needed improvement, and some students remained awkward in presenting their findings to the class (Hamka et al., 2023). The reflection phase at the end of Cycle I identified several major weaknesses. The most prominent weaknesses were ineffective time allocation during the data collection stage and the lack of in-depth teacher guidance as students formulated conclusions. As an integral part of Classroom Action Research, this in-depth evaluation served as the basis for designing more focused improvements in Cycle II (Arikunto, 2002).

Based on the results of the Cycle I reflection, the action improvements in Cycle II focused on strengthening the teacher's role as a facilitator, particularly in guiding students' critical thinking processes toward formulating accurate conclusions. The teacher also implemented stricter time management and provided more intensive scaffolding for groups that remained passive. The implementation of Cycle II resulted in very satisfactory improvements, confirming the action hypothesis. The average science class grade increased sharply to 82, and the percentage of classical completion reached 88% (22 out of 25 students). This 88% figure exceeded the research success indicator of 80%. This success demonstrates that the Inquiry Learning Model is an effective approach in the context of science learning at the elementary school level. This improvement is consistent with findings that problem-based learning models, such as Problem-Based Instruction, can significantly improve learning outcomes in subjects requiring problem-solving (Putra et al., 2023).

## Discussion

The shift from conventional learning to inquiry transforms objects and practical activities into a kind of active "learning media." This hands-on investigation method is comparable to the effectiveness of multimedia or interactive media in visualizing abstract concepts, where the media serves as a bridge between theory and practice (Lubis, 2023). This paradigm shift is crucial, particularly in science learning, which demands concrete experiences. Passive science learning, such as that seen in pre-cycle learning, fails to establish connections between theoretical concepts and real-world phenomena. Therefore, systematic inquiry steps, from observation to conclusion formulation, force students to actively construct knowledge (Lubis, et al., 2021).

Furthermore, the success of the Inquiry Learning Model reflects the demands of 21st-century skills. When students independently formulate hypotheses and test data, they directly practice critical thinking and problem-solving skills. These competencies, along with collaborative skills, are essential foundations for facing the challenges of the modern era (Mardhiyah, et al., 2021). Equally important is the methodological validation of this research. The significant and gradual increase in learning outcomes, from 40% (Pre-Cycle), 68% (Cycle I), to 88% (Cycle II), strengthens the validity of the Classroom Action Research (CAR) method as an effective improvement framework. The CAR process ensures that the actions taken have undergone appropriate adjustments based on reflective empirical evaluation (Arikunto, 2002).

The success of Inquiry Learning in Cycle II is inseparable from the teacher's central role as a supportive facilitator. Reflections on Cycle I indicated that the initial failure lay in a lack of scaffolding in formulating conclusions. Improvements focused on strengthening this role demonstrate that the quality of teacher performance, including support from the principal in encouraging innovation, is key to successful curriculum implementation (Hamka, 2023).

Comparatively, the inquiry model also demonstrates advantages over passive approaches. Other active learning models, such as Problem-Based Instruction (PBI), have been proven effective in improving learning outcomes in engineering courses (Putra et al., 2023). The philosophical similarities between PBI and Inquiry—namely, the emphasis on problems and investigation—explain why Inquiry Learning has successfully driven improvements in classical mastery at MIS Arul Relem.

Discussions about learning media have also expanded. In this context, practical activities and manipulation of real objects serve as "visual literacy" for students. Students' ability to read and interpret experimental data, rather than simply reading text, aligns with the importance of developing visual literacy, which has been widely emphasized in elementary education (Gogahu & Prasetyo, 2020). In addition to the cognitive domain, the Inquiry Learning Model effectively contributes to non-cognitive

aspects and character development. Group exploration activities require cooperation, responsibility, and discipline in following procedures. This positive impact is consistent with research showing that active learning models can foster positive character traits such as discipline, which is essential at the elementary school level (Lubis et al., 2022).

The implication of these findings for school policy (MIS Arul Relem) is the importance of adopting active learning models sustainably, not only in science subjects. This success must be supported by pro-innovation school policies, including the provision of adequate facilities and infrastructure for practical activities, in line with the curriculum's role in enhancing harmony between the community and schools (Pebtiyanti et al., 2023). Overall, the findings of this study convincingly underscore the importance of shifting the paradigm of science learning at the elementary level from knowledge transmission to knowledge construction. The implementation of the Inquiry Learning Model has proven effective in improving cognitive learning outcomes and simultaneously developing students' character. Therefore, this model is recommended as a primary option in efforts to improve the quality of science learning in elementary schools.

## Conclusion

Based on the analysis of Classroom Action Research (CAR) data, it can be concluded that the implementation of the Inquiry Learning Model effectively improved science learning outcomes for fifth-grade students at MIS Arul Relem. This improvement is clearly evident from the comparison of learning completion data from the pre-cycle to Cycle II. In the pre-cycle stage, students' classical completion rate only reached 40%, indicating low engagement and conceptual mastery. After the corrective action intervention through the Inquiry Learning Model, classical completion rate increased to 68% in Cycle I. Peak success was achieved in Cycle II, where the classical completion rate jumped to 88%, exceeding the established research success indicator (80%). Therefore, the action research hypothesis stating that the Inquiry Learning Model can improve science learning outcomes for fifth-grade students at MIS Arul Relem is accepted. The effectiveness of the Inquiry Learning Model stems from its characteristics, which encourage students to actively construct knowledge through a series of independent investigation processes, from formulating problems to drawing conclusions. This model has been proven to not only improve students' cognitive aspects (learning outcomes) but also foster essential 21st-century skills such as critical thinking, problem-solving, and collaboration. Therefore, the implementation of this model is highly recommended for science teachers, particularly at the elementary school level, as a pedagogical strategy oriented towards improving the quality of learning and students' overall academic achievement.

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