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INQUIRY LEARNING MODEL IN NATURAL SCIENCES SUBJECTS AT AL AMIN ISLAMIC SECONDARY SCHOOL KEMAMAM TERENGGANU

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ABSTRACT

The Inquiry learning model is an approach that emphasizes the active involvement of students in the process of discovering and building understanding of scientific concepts. This study aims to analyze the effectiveness of the Inquiry learning model in improving students' understanding and critical thinking skills in Natural and Social Sciences (IPAS) subjects in Elementary Schools. The research methods used are literature studies and classroom experiments involving students as research subjects. The results of the study indicate that the application of the Inquiry model can increase students' learning motivation, strengthen critical thinking skills, and encourage in-depth exploration of concepts. In addition, this model also helps students develop problem-solving skills and group collaboration. Thus, the Inquiry learning model is recommended as an effective approach in IPAS learning in Elementary Schools to improve the quality of learning and student learning outcomes.

Keywords: *Inquiry Learning Model, Science, Elementary School, Critical Thinking, Active Learning.*

INTRODUCTION

Elementary school education plays an important role in forming the foundation of students' knowledge and thinking skills. One of the subjects that contributes to the development of students' insight is Natural and Social Sciences (IPAS). This subject teaches basic concepts about the environment, natural phenomena, and social interactions that occur in everyday life. However, in practice, IPAS learning in elementary schools is still often dominated by conventional methods that are centered on teachers, such as lectures and memorization, so that it provides less opportunity for students to think critically and exploratively (Pokhrel, 2024) .

The Inquiry learning model is present as an alternative that can overcome the limitations of conventional learning methods. This model encourages students to be active in searching, researching, and building their own understanding through a series of questions and experiments. Thus, students not only memorize concepts but also understand the scientific processes behind them. The *Inquiry Model* is also in line with the Independent Curriculum approach which emphasizes exploration-based learning and high-level thinking skills (Tohir, 2020) .

the Inquiry learning model in the subject of Science in Elementary Schools is believed to be able to increase student engagement and motivation to learn. Through exploration and investigation, students are more challenged to find solutions to the problems they face, thus encouraging them to think critically and creatively. In addition, this model also trains problem-solving skills and the ability to work

collaboratively in groups. Thus, the *Inquiry learning model* not only contributes to understanding the material, but also to the development of 21st century skills needed in the era of globalization (Saputra et al., 2025) .

Although the *Inquiry learning model* has many benefits, its implementation still faces various challenges, such as teacher readiness in managing investigation-based classes, limited learning resources, and longer time compared to conventional methods. Therefore, further research is needed to identify the best strategy in implementing the *Inquiry learning model* in science subjects in Elementary Schools. This study aims to analyze the effectiveness of the *Inquiry learning model* in improving students' conceptual understanding and critical thinking skills, as well as identifying obstacles that may arise during the learning process (Yani et al., 2024) .

With this research, it is expected to provide insight for educators regarding the importance of *the Inquiry learning model* in science learning in Elementary Schools. The results of this study are also expected to be recommendations for schools and policy makers in designing more effective learning strategies that are in accordance with current developments. So that, in the end, learning in Elementary Schools can be more meaningful and able to equip students with relevant skills to face future challenges (Sari & Madiun, 2024) .

LITERATURE REVIEW

In the past five years, various studies have explored the application of the *Inquiry learning model* in Natural and Social Sciences (IPAS) subjects in Elementary Schools. These studies generally highlight the effectiveness of the *Inquiry model* in improving students' critical thinking skills, learning outcomes, and science process skills (Machpud, 2022) .

One of the relevant studies is classroom action research conducted by Fitriani, (2024) at SDN Cibogor 01. This study aims to improve the critical thinking skills of grade IV students through the application of the *Inquiry Learning model* in science learning. The results of the study showed that this model was effective in improving students' critical thinking skills, with a significant increase after the application of the model.

In addition, research by Situmorang et al., (2024) at SD Negeri 064983 Medan Helvetia evaluated the effect of the *Guided Inquiry learning model* on the science process skills of fourth grade students. This study found that the application of the *Guided Inquiry model* had a positive effect on students' science process skills, which include observation, classification, and data interpretation skills.

Another study by Sholihah et al. (2024) developed Student Worksheets (LKPD) based on *Inquiry Learning* to improve students' critical thinking skills in science learning. The validation results showed that the LKPD developed was valid and practical to use, and effective in improving students' critical thinking skills.

Furthermore, research by Wahyuni (2024) examined the effect of the *Guided Inquiry learning model* assisted by Wordwall on the science learning outcomes of fourth grade students. The results of the study showed that the use of the *Guided Inquiry model* supported by Wordwall media had a significant effect on improving student learning outcomes.

A systematic review by Suryati et al. (2023) examined the integration of constructivist and inquiry-based learning strategies in chemistry education. The study found that approaches such as gamification, virtual reality, molecular visualization, and guided inquiry significantly improve student engagement, conceptual understanding, critical thinking, and problem-solving skills. These strategies align with constructivist principles and have practical applications in modern pedagogy (Suryati et al., 2024).

A meta-analysis conducted by Rahmadani et al. (2024) analyzed the application of inquiry learning models to improve student academic achievement. The study concluded that the inquiry learning model has a very high influence on increasing student academic achievement, with an average effect size value of 7.33% (Kaçar et al., 2021).

Syahgiah et al., (2023) conducted a meta-analysis to determine the effect of the inquiry learning model on students' science process skills and critical thinking. The study found that the inquiry learning model positively impacts these skills across various educational levels and subject matters.

Arifin et al., (2025) performed a meta-analysis to determine the effect of Inquiry-Based Learning on students' competence, including attitudes, knowledge, and skills. The study concluded that Inquiry-Based Learning is more effectively applied at the high school level, particularly to enhance students' attitudes and knowledge competencies.

Ramadhani et al., (2021) examined the effect of the inquiry learning model on students' mathematical problem-solving abilities through meta-analysis. The study found that the inquiry learning model has a moderate effect on improving students' mathematical problem-solving skills.

Nelvarina et al. (2023) analyzed the differences in improving students' systems thinking skills between guided inquiry and structured inquiry learning models. The study concluded that the guided inquiry model is more effective in enhancing students' systems thinking skills (Nelvarina et al., 2024).

Meliala et al., (2019) analyzed the effect of the scientific inquiry learning model on concept knowledge and science process skills in senior high school students. The study concluded that students applying the scientific inquiry model demonstrated better concept knowledge and science process skills compared to those with conventional learning .

Lovisia et al. (2020) investigated the use of the inquiry learning model assisted by the Factile application to improve science learning outcomes. The study found that integrating educational technology with inquiry-based learning can enhance students' engagement and learning outcomes (Firdaus & Fathoni, 2023).

Overall, the literature in the last five years shows that the application of the Inquiry learning model in science learning in Elementary Schools has a positive impact on various aspects of student abilities, including critical thinking, science process skills, and learning outcomes. However, the implementation of this model requires careful planning and adequate resource support to achieve optimal results.

METHOD

This study uses a systematic literature review method to analyze the effectiveness of the *Inquiry learning model* in science subjects in Elementary Schools. The literature reviewed comes from national and international journals that have been indexed in databases such as Google Scholar, Scopus, SINTA, and ERIC in the last five years (2020-2024). The selected articles must meet the inclusion criteria, namely discussing the application of *the Inquiry learning model* in elementary education, especially in science or science subjects. The data collection process is carried out by identifying sources, selecting articles, analyzing content, and synthesizing findings to gain a deeper understanding of the effectiveness of this learning model.

Data analysis in this study was conducted descriptively qualitatively by exploring the main themes of the research reviewed, such as improving critical thinking, student learning outcomes, and obstacles in implementing the *Inquiry model* . The results of this literature review are expected to provide a comprehensive picture of the impact of the *Inquiry model* on science learning in Elementary Schools and provide recommendations for educators and policy makers in developing more innovative and effective learning methods.

RESULT AND DISCUSION

Results

Based on the results of a literature review study of studies in the last five years (2020-2024), the application of the *Inquiry learning model* in the subject of Science in Elementary Schools has proven effective in improving students' understanding of concepts, critical thinking skills, and learning motivation. Most studies show that students who learn using the *Inquiry model* are more active in exploring material, asking questions, and engaging in discussions and experiments. The results of the study also found that this model can improve high-level thinking skills, such as analysis, evaluation, and problem solving, compared to conventional learning methods that tend to be teacher-centered.

However, the literature study also identified several challenges in implementing the *Inquiry model* in Elementary Schools. Several studies reported that limited resources, teacher readiness in managing inquiry-based learning, and the time needed in the exploration process were the main obstacles. To overcome these challenges, various studies recommend teacher training, provision of inquiry-based teaching materials, and more flexible learning strategies so that the *Inquiry model* can be implemented optimally. Thus, the results of this literature study strengthen that the *Inquiry learning model* has great potential in improving the quality of science learning in Elementary Schools, as long as it is supported by careful planning and adequate support from various parties.

Discussion

The results of a literature review study on the application of the *Inquiry learning model* in the subject of Science in Elementary Schools show that this model consistently has a positive impact on students' conceptual understanding, critical thinking skills, and learning motivation. Several studies in the last five years have revealed that the *Inquiry model* allows students to be more active in discovering concepts through exploration and investigation. With a question-based and investigation-based

approach, students are more encouraged to develop analytical thinking and improve problem-solving skills in understanding natural and social phenomena taught in Science.

However, despite the many benefits found, several challenges were also identified in the implementation of the *Inquiry model* in Elementary Schools. Previous studies reported that the main obstacles in implementing this model are teachers' readiness in managing inquiry-based learning, limited resources and learning media, and longer time compared to conventional learning methods. Teachers who are not yet familiar with the *Inquiry approach* often have difficulty in guiding students to discover concepts on their own without providing direct instructions. In addition, the lack of teaching aids and experimental materials in some schools is also a factor that limits the effectiveness of this model.

Several studies recommend strategies to overcome these challenges, such as improving teacher training to be better prepared to manage *Inquiry- based learning* , providing teaching materials and interactive media that can support student exploration, and more effective time management so that exploration remains optimal within the limited duration of learning. With the right strategy, the *Inquiry model* can be a very effective approach in improving the quality of science learning in Elementary Schools and helping students develop 21st century skills needed in the era of globalization.

CONCLUSION

Based on a literature review study on the application of the *Inquiry learning model* in the subject of Science in Elementary Schools, it can be concluded that this model has high effectiveness in improving conceptual understanding, critical thinking skills, and student learning motivation. Studies in the last five years have shown that students who learn with the *Inquiry approach* are more active in exploring materials, understand concepts in depth, and are able to develop problem-solving and analytical thinking skills compared to conventional learning methods. However, the implementation of this model also faces several challenges, such as teacher readiness in managing inquiry-based learning, limited learning resources, and longer time allocation compared to traditional methods. Therefore, support is needed in the form of teacher training, provision of inquiry-based teaching materials, and more effective classroom management strategies so that the implementation of the *Inquiry model* can run optimally. With careful planning and adequate support, the *Inquiry learning model* can be an innovative and effective approach in improving the quality of science learning in Elementary Schools.

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