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IMPLEMENTATION OF THE PROBLEM-BASED LEARNING MODEL IN IMPROVING PRIMARY SCHOOL STUDENTS' CRITICAL THINKING ABILITIES

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Abstract

This research aims to explore the implementation of the Problem-Based Learning (PBL) learning model in improving elementary school students' critical thinking skills through a literature review. The research method used is literature analysis from various scientific articles, journals and other trusted sources related to PBL and critical thinking in elementary school students. The research results show that PBL is effective in developing critical thinking skills through student-centered learning, the use of real-world problems as learning stimuli, and the application of collaborative strategies. Several factors that support the success of PBL include relevant problem design, support and facilitation from teachers, and ongoing evaluation with constructive feedback. This study confirms that PBL not only improves students' cognitive skills, but also motivates and arouses their interest in learning, thereby creating a more dynamic and interactive learning environment. Based on the results of this literature review, it is recommended that the implementation of PBL be further expanded and facilitated through teacher training to increase its effectiveness in supporting the development of critical thinking in elementary school students.

Keywords: Problem-Based Learning, Critical Thinking, Elementary School

INTRODUCTION

Critical thinking ability is an essential skill that needs to be developed from an early age in elementary school students (Edy et al., 2024). In today's rapidly developing information era, children are not only required to remember and understand information, but also to analyze, evaluate, and apply this knowledge in various contexts. Basic education plays an important role in shaping students' mindsets which will influence the way they solve problems in everyday life (Nurlaelah, 2023). Therefore, developing critical

thinking skills should be a primary focus of teaching in elementary schools, as it equips students with the tools needed to face academic and social challenges.

In addition, critical thinking helps students to become more independent and proactive learners. With this ability, students can ask relevant questions, explore various possible solutions, and make decisions based on careful judgment. In an elementary school environment, this means students are braver to participate actively in class discussions, think creatively in completing assignments, and collaborate with peers in more effective ways. Developing these skills can also increase students' self-confidence, encouraging them to contribute more significantly to the learning environment (Khoirulloh et al., 2024).

Furthermore, the development of critical thinking in elementary school children has long-term implications for society. Students who are skilled in critical thinking tend to grow into individuals who are more able to make positive contributions to their communities. They are more adaptive to change, able to identify and solve problems in innovative ways, and have the ability to communicate and collaborate with other people from various backgrounds (District & Rosidin, 2024). Thus, cultivating critical thinking skills from an early age is not only beneficial for students' individual development, but also for the social and economic progress of society as a whole.

One of the main challenges in basic education related to developing critical thinking skills is a curriculum that is too dense and focuses on achieving standardized test results. As pressure to meet academic standards increases, teachers often prefer teaching methods oriented towards memorization and repetition of information rather than encouraging students to think critically. This rigid and less flexible curriculum inhibits opportunities for students to develop essential analysis, evaluation, and problem-solving skills. As a result, students may fail to develop the abilities needed to understand and process information in depth (Nurlia, 2024).

Another challenge lies in the teacher's readiness and ability to integrate critical thinking teaching into daily practice in the classroom. Not all teachers have adequate training to teach critical thinking skills effectively, and some may be unsure how best to implement such teaching strategies (Tobing, 2022). In addition, limited time and resources in elementary schools can hinder teachers' efforts to design and implement learning activities that prioritize critical thinking. Without adequate support, both in terms of professional

training and access to relevant learning materials, it is difficult for teachers to instill these skills in their students (Kusumawardani, 2024).

Apart from a lack of structural support, there are also cultural challenges in developing critical thinking skills in elementary schools. Some communities may have a traditional view of education that emphasizes obedience and accepting information from authority without question. In this type of environment, students may not feel empowered to express their opinions, ask critical questions, or investigate thinking from multiple points of view (Auliya & Muchlis, 2024). Changing school culture to be more open to intellectual exploration and constructive debate requires time and effort, as well as commitment from the entire educational community including parents, school administration, and supportive educational policies (Yuanata et al., 2023).

Problem-Based Learning (PBL) is an innovative and student-centered learning approach where students learn about a subject through real problem solving experiences (Asri et al., 2024). In this approach, students are faced with a complex and open problem, which requires knowledge and skills from various disciplines to be solved. Compared to traditional learning methods that often rely on repetition and memorization, PBL emphasizes deep understanding and practical application of what is learned.

One of the key aspects of PBL is that students direct their own learning process, with the teacher acting as a facilitator or guide (Ramadhan & Mardin, 2023). In a PBL environment, students work collaboratively in small groups to identify what they know and what they need to know to solve a given problem. They then conduct research, discussion and reflection to develop a more comprehensive understanding of the topics studied (Susilawati & Supriyatno, 2023). This process not only improves students' critical thinking and analytical skills, but also strengthens important social and communication skills.

PBL is widely adopted at various levels of education, from elementary school to higher education, as well as in fields such as medicine, engineering, and business. The effectiveness of PBL lies in its ability to connect theory with direct practice, so that students can see the relevance of what they learn to real world situations (Pratiwi et al., 2023). By integrating PBL into the curriculum, educational institutions can help students become more independent, creative thinkers and ready to face the complex and ever-changing challenges of the future.

RESEARCH METHOD

The study in this research is qualitative with literature. The literature study research method is a research approach that involves the analysis and synthesis of information from various literature sources that are relevant to a particular research topic. Documents taken from literature research are journals, books and references related to the discussion you want to research (Earley, M.A. 2014; Snyder, H. 2019).

RESULT AND DISCUSSION

Implementation of PBL in Education

Implementing Problem-Based Learning (PBL) in elementary schools requires careful design to suit the needs and abilities of students at that level. The initial strategy that can be implemented is to introduce the PBL concept gradually, starting with simple problems that are relevant to students' daily lives (Suciati et al., 2024). For example, teachers can ask students to solve school environmental problems, such as identifying ways to reduce waste or improve environmental cleanliness. The problems should be designed to foster basic skills, such as observation, analysis, and critical thinking.

The teacher's role in PBL in elementary schools is very important as a facilitator who provides guidance and support. Teachers need to encourage students to collaborate in groups, discuss different points of view, and develop hypotheses and potential solutions. Teachers must also provide sufficient resources and various learning tools, such as books, videos, or access to the internet, so that students can gather the required information (Arzak & Prahani, 2023). During this process, it is important for teachers to provide constructive feedback and motivate students to continue to engage in the learning process.

For PBL to be successfully implemented, evaluation at the end of the project is a crucial step. Assessment in PBL not only focuses on the final result, but also on the process that students go through. This evaluation can take the form of a group presentation where students explain the solution and how they achieved it (Kim, 2022). In addition, individual and group reflection about what was learned and how the learning process took place is important for developing students' metacognitive abilities (Wahyudin et al., 2024). With the right strategy, implementing PBL in elementary schools not only increases academic achievement, but also provides a more meaningful and enjoyable learning experience for students.

As a further step, elementary schools could consider integrating PBL into the broader curriculum, ensuring that the projects or problems at hand cover a wide range of subjects. This aims to provide a more comprehensive and contextual understanding. For example, in a project on water conservation, students can learn mathematical concepts through calculating water use, understand scientific aspects about the water cycle, and develop writing skills by creating reports or articles about their findings and solutions (Zahra & Baa, 2024). This cross-disciplinary approach supports the success of PBL and makes it an integral part of the student learning experience.

Additionally, involving parents and the community can enrich the PBL experience in elementary schools. Schools can hold project showcase events where students present their solutions to parents and community members. This community involvement not only increases students' motivation but also provides broader insight and moral encouragement for them. Parents and communities can act as sources of information or even collaborators in certain projects, increasing the relevance of learning and connecting it to the real world (Fauzi'ah & Khaliyah, 2022).

It is important for schools to build a learning culture that supports PBL. This includes sufficient training for teachers to develop facilitation skills, as well as providing a flexible and resource-rich classroom environment. Holding regular reflection and evaluation sessions between teachers and students to discuss strengths and areas of improvement in projects that have been carried out can increase the effectiveness of PBL implementation (Sumardi, 2023). By adopting these practices and policies, the implementation of PBL in elementary schools is expected to increase students' overall creativity, independence and cooperation.

In the Project-Based Learning (PBL) method, the teacher's role changes from giving instructions to facilitating the learning process. Teachers not only deliver lesson material, but also design projects that are challenging and relevant for students. They guide students through the learning process by providing direction, resources, and constructive feedback. Teachers help students plan projects, develop critical thinking skills, and apply their knowledge to solve real problems. As facilitators, teachers also encourage discussion and collaboration, ensuring each student has the opportunity to contribute to and learn from each other (FENG et al., 2024).

Students, on the other hand, play a more active and independent role in PBL. They are responsible for planning, executing, and completing their own projects. In this process, students learn to manage time, work in teams,

and search for and evaluate relevant information. They also have the opportunity to explore their personal interests in the context of a project, which can increase motivation and engagement in learning. Students are expected to demonstrate initiative, creativity, and problem solving skills necessary to complete the project (Meng et al., 2023).

The interaction between teachers and students in PBL is very dynamic and collaborative. Teachers provide the necessary support, while students play an active role in their learning journey. Open communication between teachers and students is the key to successful PBL, where teachers can assess student development and provide constructive feedback on an ongoing basis (Kwon, 2024). This evaluation process not only involves assessing the final results of the project but also includes reflection on the learning process, teamwork and skills that have been developed. Thus, PBL creates a learning environment that is holistic, integrated, and student-centered.

The Relationship Between PBL and Critical Thinking

The relationship between Project-Based Learning (PBL) and improving critical thinking skills is mainly based on the concept of constructivism in learning theory. According to this theory, effective learning occurs when students are actively involved in the process of seeking and forming knowledge. PBL, with its approach focused on real projects and problems, provides an ideal platform for students to build their understanding based on direct experience and critical reflection (Halpern & Dunn, 2022). In the PBL context, students are faced with complex and relevant challenges, which force them to analyze information, identify problems, and seek creative and data-based solutions.

Another theory that supports the relationship between PBL and critical thinking is the theory of cognitive development introduced by Jean Piaget. Piaget stated that knowledge is built through active interaction with the environment and that cognitive development occurs through a series of stages. PBL encourages students to interact with real and complex situations that do not have one right answer, thus challenging them to think more deeply and analytically (Fadli, 2023). Through these stages, students learn to evaluate evidence, consider multiple points of view, and develop logical arguments based on their own findings.

In addition, the social learning theory developed by Lev Vygotsky also provides a theoretical basis for this relationship. Vygotsky emphasized the importance of social interaction in learning, where students can learn from

each other through discussion and collaboration. In the PBL context, collaboration and group discussions become key elements that allow students to share ideas, debate their thinking, and develop critical thinking skills through feedback from their peers (Mulyono & Ubaidillah, 2024). Through this process, students learn to articulate their thoughts more clearly, evaluate others' critical thinking, and build deeper understanding collectively. Thus, PBL not only helps improve individual critical thinking abilities, but also promotes collaborative learning that supports comprehensive cognitive development.

Previous studies have shown that Project-Based Learning (PBL) has a significant positive impact on the development of students' critical thinking skills. For example, research conducted by Thomas (2000) showed that students who engaged in PBL demonstrated greater improvements in critical thinking skills compared to those who learned through traditional methods. Thomas found that PBL allows students to practice and hone their analytical, evaluative, and synthetic skills through complex tasks that require deep thinking and creative problem solving (Yang et al., 2023).

In addition, research conducted by Barron et al. (1998) also supported these findings, stating that students involved in PBL were able to show significant improvements in their ability to think critically and solve problems. In this study, PBL students were given real projects related to their curriculum, which required them to conduct research, review information, and present their findings logically. Research results show that these students are not only more proficient in critical thinking skills, but also more motivated and more engaged in their learning (Yurtkulu & Arslan, 2023).

Another study by Strobel and van Barneveld (2009) conducted a meta-analysis of various studies on PBL and found that PBL consistently outperformed traditional methods in improving students' critical thinking skills. This meta-analysis covers a wide range of disciplines and levels of education, showing that the benefits of PBL apply widely and are not tied to just one subject or age group. The conclusions of this meta-analysis emphasize that PBL is not only effective in improving critical thinking skills but also in preparing students for real-world challenges and situations that require critical thinking and creative solutions (Arslan & Yurtkulu, 2024).

Factors that Influence the Success of PBL in Improving Critical Thinking

The success of Project-Based Learning (PBL) in improving students' critical thinking skills is influenced by various factors. One of the main factors

is the project design used in PBL. Well-designed projects, which have clear, relevant, and challenging learning objectives, tend to be more effective in encouraging students to think critically. Such projects often involve complex and authentic problems that require in-depth research, critical analysis, and creative solutions (Karaca, 2023). Thus, students are forced to use higher order thinking skills to complete their assignments.

Another important factor is support and guidance from teachers. Teachers who are competent in implementing PBL and able to provide timely and constructive guidance are essential for the success of PBL (Borisová & Pintes, 2022). Teachers need to act as facilitators who help students develop their understanding, ask questions that encourage critical thinking, and provide feedback that helps students refine and develop their ideas. Teachers must also create a classroom environment that supports collaboration and productive discussion, where every student feels valued and encouraged to contribute (Alkubaisi, 2023).

Student involvement is also a determining factor in the success of PBL. This involvement not only means active participation in the project, but also includes a sense of ownership and responsibility for the learning process. Students who feel motivated and interested in the projects they work on tend to be more committed and more willing to put more effort into developing their critical thinking skills. This factor is often influenced by the relevance of the project to students' interests and how the project connects to their real lives (Khodashenas, 2023). Therefore, it is important that PBL projects are designed to interest students and relate to their own context and experiences.

In addition to project design, teacher support, and student involvement, learning environmental factors also play a crucial role in the success of PBL. The learning environment must be conducive to effective interaction and collaboration among students. Classes that are equipped with adequate resources and technology can help students access information, share ideas, and produce quality final products. A safe and inclusive environment is also important so that students feel comfortable expressing their opinions and ideas without fear of being judged (Zakaria et al., 2023). Under these conditions, students are more likely to engage in the critical discussions and deep reflection that are essential in project-based learning.

Furthermore, evaluation and feedback factors cannot be ignored in the PBL context. A process of ongoing evaluation and constructive feedback really helps students understand their strengths and weaknesses, as well as areas

for improvement. Feedback provided during the project work process can help students make real-time adjustments and improvements, which in turn will improve the quality of the final results and the development of their critical thinking skills (Hidayati & Wulandari, 2024). Evaluation in PBL should not only focus on the final results of the project, but also on the process, including the reasoning and decision-making skills demonstrated by the students.

Collaboration between students is also another significant factor in PBL. In working together, students are invited to share different perspectives, discuss ideas and opinions, and work together to achieve common goals. This process not only improves critical thinking skills, but also social skills such as communication, leadership, and collaboration. Collaborative learning allows students to test and refine their thinking through the dynamic exchange of ideas with peers. This creates space for arguments and counter-arguments to develop, which is an important element in critical thinking (Akcaoğlu et al., 2023).

It is important to consider the individualization aspect in PBL. Every student has different needs, interests and learning styles. Therefore, successful PBL is usually tailored to accommodate these individual differences. Giving students the freedom to choose topics that suit their interests and the approaches they find most effective can increase their motivation and engagement in the project. When students feel that learning is personalized and relevant, they are more likely to engage in a deep and reflective learning process, which will ultimately develop their critical thinking skills more effectively (YILMAZ, 2023).

By considering these various factors, PBL can be a very powerful and effective learning approach in developing critical thinking and other important skills in students.

CONCLUSION

The implementation of Project Based Learning (PBL) has proven to be effective in developing students' critical thinking abilities. The main findings indicate that PBL provides an environment conducive to interaction and collaboration, allowing students to be actively involved in the learning process. Factors such as strong project design, support from teachers, a supportive learning environment, and an ongoing evaluation process with constructive feedback all play an important role in the success of PBL. Additionally, collaboration between students encourages the exchange of

different ideas and perspectives, while individualization in PBL allows each student to explore their interests and choose the most effective approach to their learning.

Overall, PBL creates a more personalized and relevant learning experience, thereby increasing student motivation and engagement. Higher levels of engagement allow students to engage more frequently in critical discussions and deep reflection, essential for the development of critical thinking skills. Thus, PBL not only improves academic results, but also prepares students to become critical thinkers and better problem solvers in real life.

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