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LITERATURE REVIEW: THE EFFECT OF PROBLEM-BASED LEARNING (PBL) LEARNING MODEL ON STUDENTS' CRITICAL THINKING

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Abstract: Education is critical because, without education, it is difficult for society to develop and will be left behind. Education is one of the efforts to improve the quality of human energy sources, encompassing both physical, mental, and spiritual aspects. The problem-based learning (PBL) learning model is one of the learning models that can help students develop their critical thinking skills to solve problems. This study aims to determine the influence of the Problem-Based Learning (PBL) model on students' critical thinking skills. The method used in this study is a literature review. A total of 15 relevant articles were selected and analyzed to determine the influence of the Problem-Based Learning (PBL) model on students' critical thinking skills. The results of this literature review indicate that the Problem-Based Learning (PBL) model has a significant impact on improving students' critical thinking skills. Through Problem-Based Learning (PBL), students engage in a real-world problem-solving process, encouraging them to think analytically, critically, and creatively.

Keywords: Education, Problem-based learning (PBL), Critical Thinking

INTRODUCTION

The Indonesian government also understands the importance of education for its people. Since the country's establishment, education has been listed among the nation's primary goals, which is reflected in the concept of educating the nation's youth. This is not something that happened by chance. When Indonesia became an independent country, the government committed to the compulsory education program to enable people in Indonesia to learn and improve the quality of education (Sitompul, 2021). Quality education not only provides knowledge but also trains us to be critical thinkers, as students need to analyze questions and dig deeper into everything they learn. Not only does the Government receive information in this manner, but it also emphasizes education in the form of logical and critical thinking skills, rather than just memorization. Therefore, as the next generation of the nation, students must continue to develop their critical thinking skills so that they can face today's challenges and find solutions to the problems that occur around them.

Based on this description, a learning model is needed that supports the development of students' critical thinking skills. The learning model that can develop students' thinking skills is Problem-Based Learning (PBL) (Jazilatul Fitriyyah & Sri Hartati Wulandari, 2019). In Indonesia, student learning outcomes remain low, suggesting that the quality of education at schools is also subpar. This can be seen from the initial data on student assignment grades and daily tests, which are still below the KKM.

The Problem-Based Learning model is one of the learning models that can help students develop their critical thinking skills to solve problems. Students who possess the ability to think critically will be more effective in making decisions, processing information, and overcoming existing problems or issues (Rahman et al., 2020). On the other hand, Aprilianingrum & Wardani (2021) also explain that Problem-Based Learning is a model designed to provide opportunities for students to gain learning experiences in organizing, researching, and solving complex everyday problems. PBL offers ample space for students to develop higher-order thinking skills, including

critical, creative, and collaborative thinking.

Many factors affect learning outcomes, one of which is the learning model used. The Problem-Based Learning model is a cooperative learning approach that requires students to be active and motivated, enabling them to support and help one another in mastering the subject matter being studied (Djonomiarjo, 2019). In line with his research Setiaji et al., (2021) He explained that, in addition to students' thinking ability, there are also factors that greatly affect student learning outcomes, namely learning independence. Independent students will be able to master the material and solve the problems they encounter. Independent learning requires students to be active and not dependent on teachers, but it also explains why this is the case. Yanuarti Soima et al., (2021) PBL is a learning model where students gain knowledge from the learning materials presented, by using real-life problems and daily life examples as a context for learning to think critically and solve problems.

Critical thinking skills are essential for current and future students. Critical thinking habits should be developed from an early age, enabling students to navigate changing situations and life challenges that continue to emerge. Essential skills of thinking train students to develop ideas and decisions from various perspectives in detail, meticulously, thoroughly, and logically. Learning in schools should enable and train students to explore critical thinking abilities (Prihono & Khasanah, 2020). And the principle of PBL is to use Hardiantiningsih et al., (2023) Real-world problems help deepen students' understanding, develop their higher-level thinking skills, and improve their problem-solving skills.

Critical thinking is an essential skill for students in today's information age. This critical thinking ability allows individuals to analyze information, evaluate arguments, and make rational decisions. In the context of education, critical thinking is not limited to memorizing facts, but also involves a deeper understanding of a concept. So that later students are expected to be able to solve problems that occur creatively. One example of Problem-Based Learning (PBL) in effective learning, where students are empowered to develop critical thinking skills, is the Problem-Based Learning model.

Based on the results of the literature review, it is evident that students tend to work together in completing tasks assigned by the teacher, resulting in minimal development of their critical thinking skills, which makes them dependent on other students to complete the task. In addition, traditional learning methods, such as lectures and memorization, which are still prevalent, tend to be less effective in developing students' critical thinking and problem-solving skills. Therefore marhamah & Hajaroh., (2020) It is explained that the general purpose of the Problem-Based Learning model is to encourage students to be more courageous and creative in imagining. With their imagination, students are guided to create discoveries, both in the form of existing improvements and new ideas. The Problem-Based Learning model is expected to change students' mindsets, enabling them to solve tasks in the form of problems critically. Based on the introduction above, the purpose of this study is to determine whether the Problem-Based Learning (PBL) learning model influences students' critical thinking.

METHOD

To study and analyze various literature and research related to the topics discussed in this article, we employ the literature review method, also known as a literature review. This method aims to answer the researcher's questions specifically through a series of processes, including identification, analysis, synthesis, assessment & comparison of all relevant literature that informs the formulation of the feud or topic observed in the research (Purwita Sari et al., 2023).

Some of the main databases include Google Scholar, ResearchGate, and Garuda (Garba Rujukan Digital), which were used to conduct literature searches during the preparation of this article. The articles for this study were selected from the 2020 to 2024 range, focusing on the topics of Problem-Based Learning and critical thinking. Only 15 articles were considered appropriate and made a significant contribution to the discussion in this article, so they were selected using relevant keywords. The purpose of choosing this article is to ensure that the information used is relevant and appropriate to the latest educational research.

RESULT AND DISCUSSION

Result

The author has examined the articles that have been collected. The author also found that the collection of literature data showed an effect of the Problem-Based Learning approach on improving students' critical thinking skills. The analyzed articles demonstrate that this approach can support the development of students' cognitive abilities in addressing learning challenges.

Table 1. Data Analysis Matrix In Articles Used In The *Literature Review*

Researcher, Year	Research Title	Method	Research Results
(Ikhsan Muhzemmil, Miftahus Surur, Tri Astindari, 2021)	The Effect of *the Problem-Based Learning* (PBL) Model on Critical Thinking of Students of Economics Class XI at MA Miftahul Ulum for the 2020/2021 Academic Year	Quantitative	There is a difference between students who learn using *the Problem-Based Learning* (PBL) model and students who learn before using the Problem-Based Learning (PBL) model. It can be concluded that the Problem-Based Learning (PBL) learning model has a significant influence on the critical thinking of students in the economics subject class XI at MA Miftahul Ulum Besuki, Even Semester, Academic Year 2020/2021.
(Neng Salamah Anisa Amalia, Mahpudin, Ujiati Cahyaningsih, 2024)	The Effect of *the Problem Based Learning* (PBL) Model on Students' Critical Thinking Ability in Social Sciences Subjects for Economic Activities	Quantitative	The Problem-Based Learning (PBL) model influences students' critical thinking skills in social studies subjects related to economic activities in grade IV of SDN Sukasari 1 for the 2023/2024 school year. This can be proven from the results of the Paired Sample T-test conducted by the researcher, which showed a significant value (2-tailed) of 0.000, indicating a p-value less than 0.05. Therefore, Ho was rejected, and Ha was accepted.
(Theresia Marisa, 2020)	Application of the *Problem-Based Learning* Model to Improve Critical Thinking Skills and Learning Outcomes in Mathematics Subject for Grade 5 Students of SD Negeri Mangunsari	Classroom Action Research (PTK)	The application of *the Problem-Based Learning* learning model with the syntax of providing problems Orientation at the beginning of learning for students, helping students organize and investigate independently and in groups, can present learning results well, inviting them to evaluate problems that arise during the learning process, can improve critical thinking skills and learning outcomes in

Researcher, Year	Research Title	Method	Research Results
	01		mathematics subjects for grade V students of SDN Mangunsari 01.
(Tri Wahyudiyantoro, Tian Febianti, Rizqullah Yumna Rusydi, 2023)	Application of the *Problem-Based Learning Model* to Improve Mathematics Critical Thinking Skills of Grade IV Elementary School Students	Classroom Action Research (PTK)	The application of *the Problem-Based Learning model can improve students' critical thinking skills in Grade 4 Mathematics at SDN Semeru 1,* Bogor City.
(Fitri Amelia Rosida, Duwi Nuvitalia, 2024)	Analysis of Problem-Based Learning *Learning Model* on Critical Thinking Ability in Science Learning Class IV SDN Gayamsari 02 Semarang	Qualitative	It shows that learning activities using the PBL model give rise to students' critical thinking skills, namely: (1) Providing simple explanations, (2) Building basic skills, (3) Conclusion, (4) Making further explanations, (5) Strategy and tactics.
(Zoimatul Fitria, Fajar Arianto, Alim Sumarno, 2024)	The Effect of *the Problem-Based Learning Model* on the Critical Thinking Ability of Elementary School Students	Quantitative	The use of *the Problem-Based Learning model can be one alternative approach that educators can use to train students' critical thinking skills, especially in elementary school students*. This can be proven based on the results obtained below, which indicate a significant influence of the Problem-Based Learning model on the critical thinking ability of grade IV students regarding tangible substances and their changes at SDN Banjar 04 Bangkalan.
(Novia Aryasanti, Radya Nyaswa, Susilo Trii Widodo, Junianto, 2023)	Application of *Problem-Based Learning* to Improve Critical Thinking Skills for Students in Elementary School PKn Learning	Classroom Action Research (PTK)	The level of critical thinking of students increased after the implementation of *the Problem-Based Learning* model. This is evidenced by the students' activity, the results of diverse discussions, and increased interaction among students. Students have new experiences after applying Problem-Based Learning, especially in solving real-world problems.
(Romario Seger Aji Pamungkas, Jan Wantoro, 2024)	Improving Critical Thinking Skills through Problem-Based *Learning Model* in Elementary School PPKn Learning	Classroom Action Research (PTK)	The effect of the application of the PBL model in improving critical thinking skills. In the learning activities of Grade V students at SD Muhammadiyah 3 Surakarta, it is evident that students are more active, daring to express their opinions, discuss, and present their findings in front of the class. The results of the written test at the end of the cycle showed an increase in students' ability to

Researcher, Year	Research Title	Method	Research Results
			identify problems, provide arguments, draw conclusions, and offer evaluations.
(Anna Fertika Zalukhu, Netti Kariani Mendrofa, Amin Otoni Harefa, Yulisman Zega, 2024)	The Effect of *the Problem-Based Learning* Model Assisted by Paper Mode Quizizz on Students' Critical Thinking Skills at SMA Negeri 1 Lotu	Quantitative	The influence of *the Problem-Based Learning learning model* assisted by Quizizz paper mode on the critical thinking ability of students at SMA Negeri 1 Lotu" for the 2022/2023 academic year.
(Suci Rahayu, Kartinah, Yenny Arfiningsih, Filia Prima Artarina, 2024)	The Difference Between Conventional Learning Models and *Problem-Based Learning* Assisted by Concrete Media on the Critical Thinking Ability of Grade V Students of SDN Mlatiharjo 01 Semarang	Quantitative	There is a difference in the impact of teaching the Problem-Based Learning model, assisted by concrete media, and the conventional teaching model on the critical thinking ability of grade V students at SDN Mlatiharjo 01, Semarang.
(Jati Rahmadana, Ahmad Khawani, Medea Roza, 2023)	Application of the *Problem-Based Learning Model* to Improve Critical Thinking Skills of Elementary School Students	Quantitative	The application of the PBL model is correlated with students' critical thinking skills, as shown in Table 3, with a correlation coefficient of 0.070. Based on the results of data analysis, it can be concluded that the PBL model is effective in improving students' critical thinking.
(Jodie Josephine, Clara Valentia Josephine, Angelina, 2024)	The Effect of *Problem-Based Learning Assessment* on the Final Score of the Block in Medical Study Program Students	Analytical observational approach	There is a significant relationship between the activeness and *critical thinking* components in *Problem-Based Learning and the final block score of 5th-semester students from the 2020 batch of the Faculty of Medicine at* Krida Wacana Christian University.
(Sitaman Said, Azhar, 2020)	Application of *the Problem-Based Learning* (PBL) Model to Improve Critical Thinking Skills and Learning Outcomes of Class XI Ips3 Students in Economics Materials at SMA Negeri 3 Bima City for the 2019/2020 Academic Year	Classroom Action Research (PTK)	The application of *the Problem-Based Learning (PBL) model can enhance students' critical thinking skills during the learning process in Grade* XI IPS 3. This is evident in changes in students' attitudes towards learning, including a greater focus on paying attention to the teacher's explanations of the material, the courage to express opinions, and an increase in enthusiasm during the learning process.

Researcher, Year	Research Title	Method	Research Results
(Zainuddin, Ct. Ruqaiyah, Ramdhani Sucilestari, Dajuita Hidayati, 2024)	The Effect of *the Problem-Based Learning* (PBL) Learning Model on Students' Critical Thinking Skills in Mathematics Subjects in Class V MIN 2 Mataram City Academic Year 2023/2024	Quantitative	The Problem-Based Learning (PBL) learning model has an impact on students' critical thinking skills in mathematics subjects in Class V, MIN 2, Mataram City, for the 2023/2024 school year. This is evidenced by the results of the hypothesis test, which used the independent sample t-test formula, yielding a t-count value of 6.164 and a t-table value of 2.026. Thus, the tcount > ttable = 6.164 > 2.026.
(Putricya Andeline, Retno Mustika Dewi, Sarirejo, Nina Dwi Suryani, 2023)	Improving Critical Thinking Skills with *the Problem-Based Learning* (PBL) Model in Economics Subject for Class X6 Students at SMA Negeri 1 Porong in 2022/2023	Classroom Action Research (PTK)	There is an improvement in critical thinking skills when using the Problem-Based Learning model. The data obtained in cycle 1 was 71.53%. There was an increase from 82.81% in cycle 2 to 88.37% in cycle 3, and in the final test, it reached 91.67%. It is said that *the Problem-Based Learning model* can be applied in economics subjects.

Discussion

Based on the results of literature reviews from several journals, it was found that there is a significant relationship between the application of the Problem-Based Learning model and the improvement of students' critical thinking skills. Problem-Based Learning involves students in the learning process by solving real-world problems, which encourages them to think more deeply and critically. According to Muhzemmil et al., (2021), Problem-Based Learning (PBL) is problem-based learning in solving problems that occur in an environment and as a basis for achieving knowledge/and understanding concepts, with critical thinking skills, so that the application of the Problem-Based Learning (PBL) model is expected to grow and improve learning outcomes and student engagement in learning activities. Meanwhile, in my opinion, Marisa (2020) suggests that PBL is a learning model that encourages students to become more focused on learning. Problems are presented at the beginning of learning to help students develop critical thinking skills and allow them to investigate and research issues throughout their learning in real-life situations. Furthermore, the Problem-Based Learning (PBL) learning model can be utilized to stimulate student engagement and enhance students' learning outcomes (Wahyudiyantoro et al., 2023).

The Problem-Based Learning model has made a significant contribution to improving students' critical thinking skills. Through the learning process, the steps contained in this model can help students enhance their abilities. The presentation of problems as the focus of learning is one of the characteristics of this model; the problems used must be appropriate to students and contextual. This is consistent with students' cognitive development in using high-level logic to solve problems or solve student problems. (Rosida & Nuvitalia, 2024). The opinion that Problem supports this research Fitria et al., (2024), Based Learning (PBL) is considered one of the most effective approaches because this model focuses on problem-solving and actively involves students throughout the learning process. As a result, this PBL model enhances student engagement and their understanding of the conceptual material required to solve problems.

To improve students' critical thinking skills, teachers can utilize problem-based learning

methods or models. The problem-based learning model refers to a teaching and learning concept that utilizes learning methods centered on real-world problems, allowing students to analyze and evaluate issues in a systematic and directed manner (Novia et al., 2023). This opinion is in line with Salamah Anisa Amalia & Cahyaningsih, (2024) The opinion that critical thinking is the activity of thinking carefully and using measures and standards to determine the solution to a problem. Critical thinking skills are beneficial for students in facing various issues in their lives; therefore, continuous training is needed to train students' critical thinking skills, starting from basic education (Pamungkas & Wantoro, 2024). The indicators of critical thinking, according to Zalukhu et al., (2024) Include interpretation, analysis, evaluation, and conclusion. Students with strong critical thinking skills will be better prepared to consider various perspectives and organize ideas when making decisions.

The Problem-Based Learning model can increase student motivation by providing challenges and creating a fun atmosphere through a process that aims to achieve understanding in problem-solving. Additionally, the Problem-Based Learning model has a positive impact on students' critical thinking skills. This is proven when students are given the treatment of the Problem-Based Learning teaching model with the support of concrete media; students will be more willing to ask questions and express their opinions. And when teachers give assignments, they are also able to provide explanations and reasons relevant to the problem (Rahayu et al., 2024). This is in line with the research carried out, which explains that student learning outcomes are also influenced by Said & Azhar, (2020) External factors, such as the subject matter presented in the form of cases or problems through the problem-based learning model (PBL), also affect student learning outcomes. Additionally, internal factors, including strong encouragement for students to solve problems with their classmates, also impact student learning outcomes.

The number of articles used as material for analysis in this study is still limited; hopefully, the next researcher can increase and enrich the number of articles discussed and analyzed, making the influence of this PBL model on students' critical thinking skills more visible. Referring to the results and findings of this study, it is hoped that it will be able to provide understanding and learning to education actors in general and teachers in particular, to be able to apply this PBL model in classroom learning, so that learning can attract interest and be effective in improving students' critical thinking so that in the future the quality of Indonesian education will be better (Rahmadana et al., 2023).

CONCLUSION

The results of this study show that the application of the Problem-Based Learning (PBL) model has a significant impact on the development of students' critical thinking skills. This learning model emphasizes collaborative problem-solving in the real world and can encourage students to be more active in analyzing, evaluating, and synthesizing information. By engaging students in situations that require problem-solving, PBL fosters the development of critical thinking skills essential for navigating future challenges in life and the workplace. Therefore, teachers who implement PBL in their classrooms must design challenging and relevant assignments and create a learning environment that supports interaction and deep reflection, enabling students to improve their critical thinking skills.

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