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THE EFFECT OF PROBLEM-BASED LEARNING (PBL) ON CRITICAL THINKING SKILLS OF STUDENTS AT NURUS SALAM ISLAMIC JUNIOR HIGH SCHOOL

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Abstract
This study aims to determine the effect of the *Problem-Based Learning* (PBL) model on the critical thinking skills of eighth-grade students at Nurus Salam Islamic Junior High School. The background of this study is based on the importance of critical thinking skills as one of the essential skills of the 21st century that must be possessed by students, especially in the context of Islamic education, which emphasizes the development of sound reasoning and logic. This study used a quantitative approach with a quasi-experimental design of the nonequivalent control group type. The research subjects consisted of two classes, namely the experimental class that used the PBL model and the control class that used conventional learning methods. The research instrument was a critical thinking ability test administered at the pretest and posttest. Data analysis was conducted using parametric statistical tests, namely independent t-tests to determine the difference in results between the two groups. The results showed that there was a significant difference in critical thinking skills between students in the experimental group and the control group. Students who learned using the PBL model experienced a higher increase in critical thinking scores compared to students who learned using conventional methods. This shows that the PBL model is effective in developing students' critical thinking skills because it creates an active, collaborative, and challenging learning atmosphere. Thus, the PBL model is recommended as a learning strategy that can improve the quality of the learning process and outcomes, especially in the development of higher-order thinking skills in Islamic school students.
Keywords: Problem-Based Learning, critical thinking, active learning, Islamic education

Abstrak
Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran Problem-Based Learning (PBL) terhadap kemampuan berpikir kritis siswa kelas VIII di MTs Nurus Salam. Latar belakang penelitian ini didasarkan pada pentingnya kemampuan berpikir kritis sebagai salah satu keterampilan esensial abad ke-21 yang harus dimiliki oleh peserta didik, khususnya dalam konteks pendidikan Islam yang menekankan pada pengembangan akal dan nalar yang sehat. Penelitian ini menggunakan pendekatan kuantitatif dengan desain eksperimen semu (quasi experimental design) tipe nonequivalent control group design. Subjek penelitian terdiri dari dua kelas, yaitu kelas eksperimen yang menggunakan model PBL dan kelas kontrol yang menggunakan metode pembelajaran konvensional. Instrumen penelitian berupa soal tes kemampuan berpikir kritis yang diberikan pada saat pretest dan posttest. Analisis data dilakukan dengan menggunakan uji statistik parametrik, yaitu uji-t independen untuk mengetahui

perbedaan hasil antara kedua kelompok. Hasil penelitian menunjukkan bahwa terdapat perbedaan yang signifikan antara kemampuan berpikir kritis siswa pada kelompok eksperimen dan kelompok kontrol. Siswa yang belajar dengan model PBL mengalami peningkatan skor berpikir kritis yang lebih tinggi dibandingkan dengan siswa yang belajar dengan metode konvensional. Hal ini menunjukkan bahwa model PBL efektif dalam mengembangkan kemampuan berpikir kritis siswa, karena mampu menciptakan suasana belajar yang aktif, kolaboratif, dan menantang. Dengan demikian, model PBL direkomendasikan sebagai strategi pembelajaran yang dapat meningkatkan kualitas proses dan hasil belajar, terutama dalam pengembangan keterampilan berpikir tingkat tinggi pada siswa sekolah Islam.
***Kata kunci**: Problem-Based Learning, berpikir kritis, pembelajaran aktif, pendidikan Islam*

INTRODUCTION

Critical thinking skills are one of the most important 21st-century skills that every student must possess. In modern education, critical thinking is not merely considered an additional skill but a core competency that must be developed systematically through relevant and contextual learning processes. Amidst the rapid development of information, technology, and globalization, students are not only equipped with the ability to memorize and understand concepts passively, but must also be able to analyze, evaluate, and create solutions to various real-life problems encountered in their daily lives. Ardianti et al., (2021) Explain one learning approach that is considered capable of developing critical thinking skills is Problem-Based Learning (PBL), which is specifically designed to encourage students to learn actively through problem solving.

Problem-Based Learning (PBL) is a student-centered learning approach that requires students to collaboratively solve real-world problems using critical and reflective thinking skills (Siswanti & Indrajit, 2023). In the PBL process, teachers act as facilitators who guide students to understand and explore a problem, identify relevant information, and find solutions through a systematic reasoning process. This learning model is in line with constructivist theory, which emphasizes that knowledge is constructed by students themselves through direct experience and active involvement. Figures such as Jean Piaget and Lev Vygotsky argue that learning is more meaningful when students play an active role in cognitive and social processes (Sholihah, 2010). Thus, PBL is a strategy that not only improves mastery of subject matter but also strengthens higher-order thinking skills.

The learning conditions at Nurus Salam Islamic Junior High School show that the learning approach used is still dominated by conventional lecture methods and written assignments. This has resulted in low student participation in the learning process and underdeveloped critical thinking skills. In initial interviews with several teachers and observations of learning activities, it was found that students tend to be passive in receiving information, lack the ability to evaluate arguments, and have difficulty in formulating solutions to problems. This condition raises concerns about the readiness of students to face real-life challenges that require in-depth analysis and reflective thinking. Therefore, more interactive and contextual learning innovations such as Problem-Based

Learning are needed, which not only activate students cognitively but also socially and emotionally.

Previous studies have shown the effectiveness of PBL in improving students' critical thinking skills. Research conducted by Safira, (2023) shows that PBL can develop deeper conceptual understanding and critical and reflective thinking skills in students. In the context of primary and secondary education, research by Ramadhan, (2021) found that the application of PBL in science subjects was able to improve the critical thinking skills of eighth-grade students at a public junior high school in Surabaya. Another study by Mayasari et al., (2022) also indicated that the PBL model significantly improved students' ability to analyze and solve mathematical problems in junior high school. In the madrasah environment, research by Marwah et al., (2021) on MTs students showed that PBL helped students to be more active in discussions and demonstrate more critical thinking skills. Additionally, research by Maduretno, (2020) testing the implementation of PBL in Islamic Education (PAI) at a private junior high school in Jakarta found significant improvements in students' critical thinking and argumentation skills.

Although these studies have proven the effectiveness of PBL in improving critical thinking skills, most of them were conducted in public schools or in exact subjects such as science and mathematics. Research specifically examining the influence of PBL on students' critical thinking skills in Islamic-based schools, such as Nurus Salam Islamic Junior High School, is still limited. Furthermore, the contextual conditions of each educational institution have different characteristics, both in terms of learning culture, students' social backgrounds, and the learning approaches used. Therefore, a study that specifically examines the implementation of PBL in the context of Islamic junior high schools is needed so that the results can be used as a more relevant and applicable reference for similar educational institutions.

This study differs from previous studies because its focus is not only on the implementation of PBL in general but also on how this model is specifically applied at SMP Islam Nurus Salam and its impact on students' critical thinking skills. This study does not only assess the effectiveness of PBL from an academic perspective but also considers the Islamic characteristics of the school, such as spiritual values and character-based learning approaches. Additionally, the instruments used in this study were designed to capture critical thinking in its entirety, from analytical, evaluative, to synthetic abilities. This provides a deeper understanding of students' learning outcomes, distinguishing this study from previous studies that tended to rely solely on achievement tests or limited observations.

The novelty of this study lies in the integration of the PBL approach with Islamic educational values in the context of learning at Islamic junior high schools. In this study, PBL is not only understood as a secular learning strategy but is also aligned with the objectives of Islamic education, namely to shape individuals who think critically while maintaining noble character. Thus, PBL is expected to improve not only the cognitive

aspects but also the affective and spiritual aspects of students. These aspects are what distinguish and make this research new, as they address the challenges of implementing modern learning models in the context of value-based education. In addition, the results of this study are also expected to contribute theoretically to the development of adaptive learning models in Islamic schools and madrasahs.

The urgency of this research is highly relevant to current educational needs, particularly in preparing a generation capable of thinking critically, creatively, and responsibly. Amid the challenges of the digital era and increasing social complexity, students must be equipped with critical thinking skills to filter information, make appropriate decisions, and resolve conflicts wisely. Islamic education bears a significant responsibility to educate students not only spiritually but also intellectually. Therefore, the implementation of PBL at Nurus Salam Islamic Junior High School can be a strategic step to address these needs. This research also supports the Merdeka Belajar (Freedom to Learn) policy, which encourages the use of active and contextual learning models at various levels of education.

The purpose of this study is to determine the effect of the Problem-Based Learning model on students' critical thinking skills at Nurus Salam Islamic Junior High School. Specifically, this study aims to describe the differences in critical thinking skills between students who learn with the PBL model and students who learn with the conventional model. This study also aims to identify factors that influence the success of PBL implementation in the context of learning in Islamic schools. Thus, the results of this study are expected to provide recommendations for teachers, school principals, and stakeholders in designing more effective learning strategies that align with students' needs. Additionally, the findings of this study can serve as a foundation for developing PBL-based learning modules integrated with Islamic values, thereby enhancing the overall quality of education at Islamic junior high schools.

METHOD

This study used a quantitative approach with a quasi-experimental method to determine the effect of the Problem-Based Learning (PBL) model on the critical thinking skills of students at Nurus Salam Islamic Junior High School (Budianto, 2024). A quantitative approach was chosen because this study aimed to measure objectively and systematically the differences in learning outcomes between the group using the PBL model and the group using the conventional learning model. The research design used was a nonequivalent control group design, in which there were two groups that were not selected randomly, namely the experimental group that received treatment in the form of the PBL model and the control group that continued to learn using the lecture or conventional learning method. Both groups were given pretest and posttest to measure students' critical thinking skills before and after the treatment was given. The subjects in this study were eighth-grade students at Nurus Salam Islamic Junior High School, selected based on academic homogeneity and ease of access in the learning process. The

research instrument used was a critical thinking ability test developed based on Ennis's critical thinking indicators, including the ability to analyze, evaluate, conclude, and make decisions. The validity and reliability of the instruments were tested in advance through limited trials to ensure the validity of the data obtained. The data analysis technique used was parametric statistical testing with the help of SPSS software, namely independent t-tests to determine the difference in results between the experimental group and the control group. Before conducting inferential analysis, prerequisite tests were performed, including normality tests and homogeneity tests to ensure that the data met statistical assumptions. Through this method, it is hoped that accurate conclusions can be drawn regarding the effectiveness of PBL in improving critical thinking skills among students in an Islamic school environment.

RESULTS AND DISCUSSION

This study aims to determine the effect of the Problem-Based Learning (PBL) model on the critical thinking skills of eighth-grade students at Nurus Salam Islamic Junior High School. This study was conducted by comparing the pretest and posttest results of critical thinking skills in two groups, namely the experimental group that received treatment using the PBL model and the control group that used conventional learning methods. The subjects in this study consisted of two classes with 30 students in each class, for a total sample of 60 students. The initial step in data analysis was to measure students' critical thinking skills through a pretest.

The pretest results showed that the average score of the experimental group was 55.33 with a standard deviation of 7.21, while the control group had an average of 54.90 with a standard deviation of 6.85. Based on these average scores, it can be concluded that the initial critical thinking skills of students in both groups were relatively balanced. To ensure that there were no significant differences between the experimental and control groups before the treatment was administered, an independent t-test was conducted on the pretest scores. The t-test results for the pretest showed a significance value (sig. 2-tailed) of $0.762 > 0.05$, which means that there were no significant differences between the experimental and control groups before the treatment was administered.

This indicates that the initial conditions of both groups were homogeneous and suitable for experimentation. After the treatment was applied over six sessions, each group was then given a posttest with questions equivalent to the pretest but in a different order and context. The posttest results showed a more significant improvement in critical thinking skills in the experimental group compared to the control group. The average posttest score in the experimental group was 78.50 with a standard deviation of 6.75, while the control group obtained an average of 67.20 with a standard deviation of 7.03. This shows a significant difference in improvement between the two groups.

To further clarify the differences in the pretest and posttest results in the two groups, the following descriptive data table is presented:

Table 1. Descriptive Statistics Pretest and Posttest Scores of Critical Thinking Ability

GROUP	AVERAGE PRETEST	SD PRETEST	AVERAGE POSTTEST	SD POSTTEST
EKSPERIMEN	**55,33**	**7,21**	**78,50**	**6,75**
CONTROL	**54,90**	**6,85**	**67,20**	**7,03**

From the table above, it can be seen that there was a significant increase in the average critical thinking scores in the experimental group, namely 23.17 points. Meanwhile, in the control group, the increase was only 12.30 points. To determine whether the difference was statistically significant, an independent t-test was conducted on the posttest scores of the two groups. The results of the t-test on the posttest scores indicate that the significance level (sig. 2-tailed) is 0.000 < 0.05, meaning there is a significant difference between the experimental group and the control group after the intervention. This implies that the implementation of the Problem-Based Learning (PBL) model has a significant positive effect on the improvement of students' critical thinking skills.

Table 2. Independent t-test results Posttest scores

VARIABEL	VALUE T	DF	SIG. (2-TAILED)
CRITICAL THINKING SKILLS	**5,978**	**58**	**0,000**

To support this analysis, an effectiveness test was also carried out through the calculation of the effect size value using Cohen's formula d. Based on the calculation results, the value of d is 1.67 which is included in the category of large effects. This value shows that the application of the PBL learning model has a very strong influence on students' critical thinking skills. In addition, a normality test was carried out using the Kolmogorov-Smirnov test on pretest and posttest data from each group. The test results showed that all data were distributed normally, as the significance value was > 0.05. For the variance homogeneity test, it was carried out using the Levene test, and the results showed a significance value of 0.421 > 0.05, which means that the data from both groups had homogeneous variance.

From the results of interviews and observations of the learning process, it was found that students in the experimental group showed an increase in activity during learning. They are more involved in group discussions, are more able to ask critical questions, and are able to present arguments logically. Teachers also reported that the classroom atmosphere became more lively and participatory. In contrast to the control group, which tends to be passive and only follows the teacher's explanation without meaningful interaction. In terms of the measured indicators of critical thinking, the highest increase occurred in the indicator of the ability to analyze and evaluate arguments. This can be seen from the results of the posttest data analysis which shows that the average student score on the analysis indicator reached 81.20 and the evaluation indicator reached 79.40. Meanwhile,

the indicators concluded and made decisions, although they increased, the increase was not as large as the previous two indicators, with an average of 76.60 and 75.80 respectively.

Table 3. Average Score Per Critical Thinking Ability Indicator (Experimental Group)

INDICATOR	AVERAGE SCORE
ANALYZE	**81,20**
EVALUATE	**79,40**
CONCLUDE	**76,60**
MAKING A DECISION	**75,80**

These findings show that PBL is effectively able to improve all aspects of students' critical thinking, with an emphasis on analytical and evaluative skills. This is in accordance with the characteristics of PBL which requires students to understand the context of the problem, examine various relevant information, and discuss solutions based on logical arguments. Interaction between students during PBL activities has also been proven to be able to improve thinking skills through collaboration and exchange of ideas.

In general, the results of this study provide empirical evidence that the application of Problem-Based Learning can significantly improve the critical thinking skills of Islamic junior high school students, especially in environments such as Nurus Salam Islamic Junior High School who were previously unfamiliar with the active learning model. The implementation of PBL also encourages students to be more confident, independent, and responsible in their learning process. Thus, these findings can be used as a basis for teachers and policymakers in Islamic schools to consider the implementation of the PBL model in daily learning activities. This study also recommends that teachers be given special training in designing and implementing PBL scenarios that are in accordance with the characteristics of students and Islamic values adopted by the school, so that learning becomes more meaningful and contextual.

DISCUSSION

The results of this study indicate that the implementation of the Problem-Based Learning (PBL) model significantly affects the improvement of critical thinking skills of eighth-grade students at Nurus Salam Islamic Junior High School. These findings reinforce the idea that problem-based learning can encourage students to be more active in processing information, understanding context, and finding solutions logically and systematically. Theoretically, these results are in line with constructivism, which emphasizes that knowledge is formed by individuals through active experience and social involvement. Vygotsky & Cole, (1978) in his *sociocultural learning* theory states that social interaction plays an important role in cognition formation, and in the context of PBL, group discussions and collaborative problem solving provide space for students to construct their knowledge in a more meaningful way.

The significant increase in critical thinking scores in the experimental group compared to the control group can be explained by the main characteristics of the PBL model, which provides real and relevant challenges in students' lives. When students are faced with contextual problems that do not have a single solution, they are encouraged to explore information, analyze data, evaluate options, and make decisions. This process is in line with the critical thinking indicators developed by Kayati et al., (2023), namely the ability to analyze, evaluate, conclude, and make decisions. In PBL, students do not simply receive information from the teacher, but are challenged to find out for themselves, ask questions, discuss, and take responsibility for the results of their thinking.

This is what makes learning not just passive, but a dynamic and reflective cognitive activity. The PBL learning model has also proven effective because it integrates critical thinking skills into the teaching and learning process in a natural way. When students work in groups to solve problems, they not only learn about the subject matter, but also communication, cooperation, and critical argumentation skills. The discussion process that takes place in groups allows students to challenge each other's arguments, ask deep questions, and develop a collective understanding of a concept. This supports Setyo et al., (2020) view on the importance of cooperative learning in improving critical thinking skills. In these interactions, students learn to build and critique arguments based on data and logic, not just personal opinions.

From the data obtained, it can be seen that the highest improvement occurred in the aspect of analyzing and evaluating arguments. This can be explained because in PBL activities, students are actively trained to identify relevant information, separate facts from opinions, and assess the strengths and weaknesses of an idea. This process encourages students to not just accept information at face value, but to consider evidence and formulate conclusions based on strong logic. This is in line with Jacub et al., (2020) view that critical thinking involves identifying hidden assumptions, testing the logic of arguments, and reflecting on various perspectives. Thus, PBL provides the right context for students to develop these skills in a concrete way. In addition, the success of the PBL model in improving critical thinking skills can also be explained through a student-centered learning approach. In traditional teacher-centered learning, teachers are the sole source of knowledge, and students tend to be passive. However, in PBL, the role of teachers shifts to that of facilitators who guide students in an active learning process. Teachers provide challenging problems, facilitate discussions, and encourage critical reflection. This approach is in line with Dewey, (2024) theory of learning, which emphasizes the importance of reflective thinking in education, where learning must begin with meaningful experiences and end with reflection on the thinking process that has been carried out.

Based on teachers' observations and reflections during the study, students in the experimental group showed higher emotional and cognitive engagement. They appeared enthusiastic in solving problems, actively participated in discussions, and demonstrated a strong curiosity about the subject matter. This indicates that PBL is also effective in

enhancing students' intrinsic motivation to learn, as they feel a sense of responsibility toward their learning process. According to Gulo, (2022), intrinsic motivation is very important in the learning process because it encourages deeper and more lasting engagement. In this context, PBL not only improves critical thinking skills but also fosters students' self-confidence and learning autonomy.

When linked to the context of Islamic education, the application of the PBL model also has significant added value. In Islam, critical thinking is part of the command to use reason optimally as stated in the Qur'an. Verses such as QS. Al-Baqarah: 164 and QS. Al-Mulk: 10 emphasize the importance of using reason to reflect on Allah's creation and distinguish between truth and falsehood. Therefore, the implementation of PBL in Islamic schools such as Nurus Salam Islamic Junior High School is not only an educational innovation but also a form of implementing Islamic values in learning. PBL can serve as a medium to cultivate critical thinking that remains grounded in Islamic ethics and morality.

The results of this study also reinforce findings from previous studies. As shown in Ghani et al., (2021) research, PBL can improve higher-order thinking skills, collaboration, and independent learning. Suryani & Rahim, (2022) study also found that PBL enhances critical thinking skills in mathematics lessons. Meanwhile, Fitriyah et al., (2024) in the context of madrasah found that students were more active and critical when learning using the PBL approach. Thus, the results of this study are consistent with previous findings but have novelty in the context of its application in Islamic schools that have a distinctive value- and spirituality-based learning approach. The striking differences between the experimental and control groups can also be attributed to the learning environment created during the PBL process. In the experimental group, an open and communicative learning atmosphere created a healthy and constructive academic climate. Students felt free to express their opinions, ask questions, and provide feedback without fear of being blamed. This kind of environment is very important in fostering a culture of critical thinking, as students feel safe to explore intellectually. This supports Maslow, (2012) theory of the *safe learning environment* in his hierarchy of needs, which emphasizes that psychological safety is a prerequisite for cognitive growth.

However, in the implementation of PBL, several challenges were also identified that need attention. Some students initially experienced difficulties in working in groups, particularly in terms of dividing tasks, listening to their peers' opinions, and integrating ideas. Teachers also need to manage time more effectively to ensure that all stages of PBL can be carried out optimally within the available time allocation. Therefore, teacher training in classroom management and good PBL scenario planning are determining factors for successful implementation. These challenges are not obstacles, but rather important inputs for the continuous development of PBL in schools. These findings imply that schools, especially Islamic-based schools, need to actively adopt learning approaches that encourage the development of 21st-century skills, including critical thinking.

In the context of the Merdeka Belajar (Freedom to Learn) curriculum, which emphasizes project-based learning and strengthening the Pancasila learner profile, the application of PBL is highly relevant. PBL can help students become critical thinkers, independent learners, and effective communicators while upholding spiritual and religious values. Therefore, this model should be considered a strategic alternative in designing learning that is not only cognitive-oriented but also character and value-oriented. Thus, it can be concluded that the Problem-Based Learning model is effective in improving students' critical thinking skills at Nurus Salam Islamic Junior High School. The advantages of PBL lie in its ability to create active, contextual, collaborative, and reflective learning. The implementation of PBL aligns with constructivist theory, reflective learning theory, motivation theory, and Islamic educational values that encourage the optimal use of reason. These findings contribute significantly to the development of adaptive and relevant learning models that meet the needs of the times and the characteristics of Islamic educational institutions.

CONCLUSION

Based on the results of research conducted on the effect of the *Problem-Based Learning* (PBL) model on the critical thinking skills of eighth-grade students at SMP Islam Nurus Salam, it can be concluded that the implementation of PBL has a significant and positive impact on improving students' critical thinking skills. This is evidenced by the comparison between the pretest and posttest results of the experimental group and the control group, where the experimental group that received treatment using the PBL model experienced a significantly higher score increase compared to the control group that was taught using conventional methods. The PBL model proved effective in developing students' abilities in analyzing, evaluating, concluding, and making decisions, which are the main indicators of critical thinking skills. Additionally, the implementation of PBL also created a more active, collaborative, and reflective learning environment, thereby motivating students to engage more cognitively and emotionally in the learning process.

Theoretically, the results of this study support the constructivist view that knowledge is constructed through experience and social interaction. PBL provides space for students to experience learning directly through challenging and relevant contextual problem solving. In the context of Islamic schools, PBL is also in line with Islamic educational values that encourage students to use their minds optimally and responsibly in seeking truth. Thus, the implementation of the PBL model not only enhances students' cognitive aspects but also shapes the character of critical, independent, and responsible learners. Therefore, the PBL learning model is worthy of being widely implemented as a learning strategy that supports the development of critical thinking skills in the field of education, particularly in Islamic educational institutions.

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