

THE APPLICATION OF THE PROBLEM-BASED LEARNING (PBL) MODEL TO IMPROVE THE CRITICAL THINKING SKILLS OF THIRD-GRADE STUDENTS AT SDN 22 JEPPE'E

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ABSTRACT

This study explored the use of Problem-Based Learning (PBL) as a learning strategy to develop critical thinking skills among third-grade students at SDN 22 Jeppe. The research was designed as Classroom Action Research and implemented in two cycles, each involving systematic stages of preparation, implementation, observation, and evaluation. The participants were third-grade students, and the study examined how learning activities based on real-world problems improved students' critical thinking abilities. Data were collected through written assessments, classroom observations, and relevant documentation. The collected data were analyzed using descriptive statistical methods to examine average scores and levels of learning achievement. The results showed a clear improvement in students' critical thinking skills throughout the research process. Initial findings in the first cycle indicated limited progress; however, notable development occurred in the second cycle following refinements to the instructional approach. These findings suggest that the PBL model can effectively enhance critical thinking skills in elementary school students.

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INTRODUCTION

Critical thinking skills are fundamental abilities that students must master in the 21st-century education era. Various national education reports indicate that students' critical thinking skills in Indonesia have not developed optimally, as reflected in international assessment results that highlight weak analytical and problem-solving skills among elementary school students (Syafitri Ely et al., 2021). This situation is supported by experts' views, which indicate that critical thinking skills are difficult to develop if the learning process remains teacher-centered and involves minimal analytical activities on the part of students (Paul Richard & Elder Linda, 2019). In reality, learning

at the elementary school level is still dominated by lecture-based methods, so students' opportunities to ask questions, process information, and express their opinions are very limited (Hayati Nurul & Setiawan Deni, 2022).

Preliminary observations at SDN 22 Jeppe'e also reveal a similar situation. Third-grade students appear to participate minimally in discussions, rarely ask questions, and are not yet able to conclude independently. This lack of participation directly impacts their critical thinking skills. These results align with recent research showing that students' low critical-thinking abilities are influenced by instructional models that do not facilitate students' engagement with real-world problems. (Gesti Pakpahan Marsaulina et al., 2025) . Furthermore, studies examining the implementation of the Problem-Based Learning (PBL) model indicate that this approach is effective in enhancing higher-order thinking skills, as students are guided to identify problems, analyze them, discuss them, and present solutions. However, the results of a preliminary study at SDN 22 Jeppe'e indicate that PBL has never been systematically implemented in third-grade classes, meaning that students' potential for cognitive development has not yet been maximized.

The gap between the ideal learning requirements—which emphasize the importance of critical thinking skills—and the actual conditions in the field highlights the need for innovation in the learning process. (I Wayan Praekanata Indra et al., 2024) . In this context, PBL is a relevant approach because it provides authentic, problem-based learning experiences that can stimulate students to think logically, analytically, and reflectively. (Alfidyah Miftah, 2025) . Although various studies have proved the effectiveness of PBL, each school has its own distinct characteristics and learning environments. Thus, this study offers novelty through the application of PBL in the context of Islamic Religious Education (PAI) for third-grade students, specifically on the topics of Fasting and the Wisdom of Fasting, which had not previously been developed as problem-based learning at SDN 22 Jeppe'e. Thus, this study not only assesses the effectiveness of PBL but also introduces a new, more contextual approach to optimizing students' critical-thinking ability from an early age.

Based on the discussion above, the research questions include how the Problem-Based Learning (PBL) model is implemented in third-grade classrooms, what students' critical thinking abilities are before and after its implementation, and the extent to which PBL is effective in improving students' critical thinking abilities. The PBL model has advantages because it emphasizes learning through real-world problems, encouraging students to actively observe, analyze, ask questions, and formulate solutions systematically. Previous research indicates that implementing Problem-Based Learning (PBL) positively impacts students' critical thinking skills. Research conducted by Hmelo-Silver (2004) states that PBL is capable of encouraging students to develop higher-order thinking skills through active engagement in contextual problem-solving (Cindy Silver Hmelo, 2004) . In line with this, Savery (2006) also found that students learning through the PBL model demonstrated improved abilities in problem analysis, logical reasoning, and systematic drawing of conclusions compared to students in conventional learning settings. (Savery, 2006) .

Research in the Indonesian educational context by Sari and Wahyuni (2021) shows that implementing PBL significantly improves high school students' critical thinking skills. This success is attributed to PBL's characteristics, which place students at the center of learning and actively involve them in solving real-world problems, thereby developing higher-order thinking skills (Wahyuni & Sari, 2021).

METHOD

This study employed Classroom Action Research (CAR) implemented in two cycles, each of which consisted of planning, action implementation, observation, and reflection stages. This model was used to assess the effectiveness of Problem-Based Learning (PBL) in developing students' critical thinking skills. The research activities took place from September to October 2025 at SDN 22 Jeppe'e, with 25 third-grade students as participants. The data used in this study included data on the learning process and learning outcomes related to critical thinking skills.

Data were collected through observations to record teacher and student activities, interviews with classroom teachers, documentation in the form of photographs and supporting notes, and tests to measure critical thinking skills at the end of each phase of the cycle. The research instruments used in this study consisted of observation sheets, interview guidelines, test instruments, and documentation. The test instrument used in this study consisted of 10 written questions designed to measure students' critical thinking skills. These questions were aligned with the indicators of critical thinking skills and the instructional content being taught. The tests were administered at each session, with the total number of questions divided into two parts: 5 questions in the first session and 5 in the second. This division of questions was intended to make it easier for students to understand and answer the questions gradually, as well as to obtain a more accurate picture of the development of students' critical thinking skills at each session. The data were analyzed using descriptive statistics, including calculating percentages of mastery and average test scores, as well as qualitative data from observations, interviews, and documentation to identify changes in students' learning behaviors. The intervention stages followed PBL principles, and findings from Cycle 1 reflection served as the basis for refining and improving the intervention in subsequent cycles.

RESULTS AND DISCUSSION

RESEARCH RESULTS

Application Of The Problem-Based Learning (PBL) Model To Enhance The Critical Thinking Skills Of Third-Grade Students At Sdn 22 Jeppe'e

This study implemented classroom interventions over two cycles with third-grade students at SDN 22 Jeppe'e. The research results were obtained using a critical thinking skills test as the primary data-collection instrument. The test was used to measure students' level of critical-thinking achievement following the implementation of the Problem-Based Learning (PBL) model. The test instrument consisted of 10 items, divided into 2 sessions, with students completing 5 items in each session. These questions were designed to measure several dimensions of students' critical

thinking skills, including the ability to understand problems, identify the core of a problem, provide logical reasoning, and draw simple conclusions from the given problems. The presentation of the research results covers the development of students' critical thinking skills in each cycle, as indicated by the test results.

1. Results of Cycle 1

The implementation of interventions in Cycle 1 indicated that the Problem-Based Learning (PBL) model began to influence students' critical thinking skills, although the results were not yet optimal. Based on the critical thinking skills test results from Cycle 1, some students were already able to understand the problems presented and attempt to provide answers; however, some students still struggled to identify the core of the problem and provide appropriate reasoning. This indicates that students' critical thinking skills are still in the "adequate" category and require improvement in the next cycle. Observations revealed:

- a. Some students actively participated in discussions, but many remained passive.
- b. Only a few students were able to identify the core of the problem.
- c. The ability to conclude remains low.
- d. Some students were not yet able to provide logical reasoning in answering questions.

The following table shows the achievement levels based on the Cycle 1 test results:

Table 1. Cycle I Critical Thinking Test Results

Description	Number of students	Percentage
Students who met the standard	14	56%
Students who have not yet met the standards	11	44%
Total	25	100%

Overall, 56% of students met the proficiency criteria, while 44% did not meet the minimum criteria. Some students were absent or did not turn in their assignments, which also affected their scores.

Table 2. Results of the Essay Test on Fasting

No	Name	M/F	Score	Remarks
1.	Adam Fais Al-Arkam	L	Did not submit	Not yet completed
2.	Akifah Khanza Humaira	P	80	Completed
3.	Akilah Almakiyah Ardian	P	60	Not yet finished
4.	Andi Alita Rachmahz	P	80	Completed

No	Name	M/F	Score	Remarks
5.	Asyah Ardeniyah	L	80	Completed
6.	Azka Ananda Alfatih	L	80	Completed
7.	Hafidzt	L	Not collected	Not yet completed
8.	Ilmayanah	P	80	Completed
9.	Kaylah	P	Missing	Not yet completed
10.	Dzaky Ardana Abi Putra	L	20	Not yet completed
11.	Muh. Afzal Nararya Copos	L	80	Completed
12.	Muh. Alfareza	L	80	Completed
13.	Muh. Anugrah Ramadhan	L	80	Completed
14.	Muh. Arrazat Alfattah	L	20	Not yet completed
15.	Muh. Awwab Irawan	L	60	Not yet completed
16.	Muh. Raka Ramadhan	L	40	Not yet finished
17.	Muh. Revang	L	60	Not yet finished
18.	Muh. Althaf Dhiyaulahaq Dafri	L	80	Completed
19.	Nur Aisyah	P	80	Completed
20.	Nur Aqilah Zahra	P	80	Completed
21.	Saufa Aqilah	P	80	Completed
22.	Ridho Anugrah Nasrah	L	40	Not yet completed
23.	Sinar Uleng	P	80	Completed
24.	Muhammad Rehan Syakil	L	0	Not yet completed
25.	Afifah Lukman	P	80	Completed

Based on the data in the table of students' critical thinking skills test results for Cycle I, the scores ranged from low to good. This variation in results indicates that students' understanding of the material and their application of the Problem-Based Learning (PBL) model in this cycle remain uneven. Some students understood the problems and completed the assignments well, but others had difficulties, and some even failed to take the test or submit their assignments.

To provide a more detailed picture of student learning outcomes in Cycle I, test score data were analyzed using descriptive statistics. This analysis aimed to identify trends in scores, levels of learning achievement, and the distribution of students' critical thinking skills following the

implementation of the PBL model in the initial phase of the intervention. The results of this descriptive statistical analysis are presented in the following table.

Table 3. Descriptive Statistics of Cycle I Essay Test Results

Descriptive Statistics	Cycle I
Minimum Score	0
Maximum Score	80
Mean	56.8
Median	80
Mode	80
Standard Deviation	31.45

Based on the results of the descriptive statistical analysis in Cycle I, an initial picture of students' critical thinking skills emerged following the implementation of the Problem-Based Learning (PBL) model. The mean score of 56.8 indicates that, in general, students' critical thinking skills are still in the "fair" category. This suggests that the implementation of PBL in the early stages has not yet had an optimal impact on all students, as some students are still adapting to a learning approach that requires active thinking and analytical skills.

The median score of 80 indicates that half of the students have achieved the learning proficiency threshold. This suggests that some students are already capable of understanding problems and completing tasks effectively. However, the class average remains relatively low because some students still scored very low. The mode of 80 indicates that this score was the most frequently achieved by students in Cycle I. This suggests that the majority of students who actively participated in the learning process met the proficiency threshold, although this achievement was not yet uniform among all students.

The maximum score of 80 indicates that in Cycle I, no students achieved a very high score. Meanwhile, the minimum score of 0 was due to students with unexcused absences or who failed to submit assignments. This situation contributed to the low average score and indicates that barriers to student engagement persist during the learning process. A standard deviation of 31.45 indicates that the distribution of student scores in Cycle I is still quite wide. This signifies a significant difference in students' critical thinking abilities. Some students have demonstrated good critical thinking skills, while others still struggle to understand problems, provide logical reasoning, and draw conclusions.

Overall, the descriptive statistics for Cycle I indicate that students' critical thinking skills have not yet reached optimal levels. Therefore, improvements and refinements to instructional strategies are needed in the next cycle to make the implementation of the Problem-Based Learning (PBL) model more effective in enhancing students' critical thinking skills.

2. Results of Cycle II

Improvements were made based on reflections from Cycle I, specifically by presenting problems more clearly, providing more guidance for group work, and using learning media. Observation results showed the following improvements:

- a. Students were more active in asking questions and expressing their opinions.
- b. Group discussions were more balanced and were no longer dominated by a few students.
- c. More students were able to identify problems, present arguments, and conclude.
- d. Students' confidence in giving presentations increased significantly.

The data in Table 2 show the results of the students' critical thinking skills test, which was administered in written form. The test consisted of 10 questions designed based on indicators of critical thinking skills. The test results were used to determine students' learning achievement following the implementation of the Problem-Based Learning (PBL) model.

Table 4. Critical Thinking Skills Test Results for Cycle II

Description	Number of Students	Percentage
Students who met the criteria	18	72%
Students who have not yet completed the course	7	28%
	25	100%

Based on the table, 18 students (72%) have achieved learning mastery, while 7 students (28%) have not yet achieved it. These results indicate that the majority of students have shown an improvement in critical thinking skills after participating in PBL-based learning. The comparison of the two cycles is illustrated in a graph showing the results from two phases: Cycle I and Cycle II.

Table 5. Table of Test Results on Fasting-Related Material

No	Name	M/F	Score	Remarks
1.	Adam Fais Al-Arkam	L	60	Not yet completed
2.	Akifah Khanza Humaira	P	Alpa	Not yet finished
3.	Akilah Almakiyah Ardian	P	Did not submit	Not yet completed
4.	Andi Alita Rachmahz	P	Absent	Not yet finished
5.	Asyah Ardeniyah	L	Did not submit	Not yet completed
6.	Azka Ananda Alfatih	L	100	Completed
7.	Hafidzt	L	100	Completed
8.	Ilmayanah	P	100	Completed
9.	Kaylah	P	100	Completed

No	Name	M/F	Score	Remarks
10.	Dzaky Ardana Abi Putra	L	80	Completed
11.	Muh. Afzal Nararya Copos	L	100	Completed
12.	Muh. Alfareza	L	100	Completed
13.	Muh. Anugrah Ramadhan	L	100	Completed
14.	Muh. Arrazat Alfattah	L	60	Not yet completed
15.	Muh. Awwab Irawan	L	100	Completed
16.	Muh. Raka Ramadhan	L	100	Completed
17.	Muh. Revang	L	Missing	Not yet completed
18.	Muh. Althaf Dhiyaulahaq Dafri	L	80	Completed
19.	Nur Aisyah	P	100	Completed
20.	Nur Aqilah Zahra	P	80	Completed
21.	Saufa Aqilah	P	100	Completed
22.	Ridho Anugrah Nasrah	L	Missing	Not yet complete
23.	Sinar Uleng	P	Alpa	Not yet finished
24.	Muhammad Rehan Syakil	L	Not collected	Not yet completed
25.	Afifah Lukman	P	Not collected	Not yet completed

Based on the data in the table of test results on students' critical thinking skills in Cycle II, the students' scores show an improvement compared to Cycle I. Most students have achieved a rating of good to very good, indicating that their understanding of problem-based learning is increasingly developing. Although there are still some students who have not achieved mastery due to absences or failure to submit assignments, in general, student learning outcomes have improved.

To gain a clearer picture of the improvement in students' critical thinking skills in Cycle II, the test score data were analyzed using descriptive statistics. This analysis aims to identify trends in learning achievement and the distribution of students' scores following the implementation of instructional improvements based on the Problem-Based Learning (PBL) model. The results of the descriptive statistical analysis for Cycle II are presented in the following table.

Table 6. Descriptive Statistics of Cycle II Essay Test Results

Descriptive Statistics	Cycle I
Minimum Score	0
Maximum Score	100
Mean	58.4
Median	80
Mode	100
Standard Deviation	46.16

Based on the results of the descriptive statistical analysis in Cycle II, there was an increase in students' critical thinking skills after improvements were made to instructional practices by implementing the Problem-Based Learning (PBL) model more effectively. The instructional improvements, based on reflections from Cycle I, positively impacted student engagement and learning outcomes. The mean score in Cycle II was 58.4, indicating an increase compared to Cycle I. This rise in the mean score suggests that, overall, students' critical thinking skills have improved as they became accustomed to problem-based learning and received more targeted guidance in the problem-solving process.

The median score of 80 indicates that more than half of the students consistently met the learning proficiency threshold. This signifies that the critical thinking skills of students in the middle-to-upper performance group have become more stable and have improved in quality compared to Cycle I. The mode in Cycle II of 100 indicates that the score most frequently obtained by students is the highest possible score. The shift in the mode from 80 in Cycle I to 100 in Cycle II indicates that an increasing number of students can achieve optimal results. This reflects the success of implementing the PBL model in encouraging students to think more critically, analytically, and systematically.

The maximum score of 100 indicates that some students achieved the highest learning outcomes in Cycle II. This demonstrates a significant improvement in the quality of student learning outcomes compared to Cycle I. Meanwhile, the minimum score of 0 is still due to students who were absent or failed to submit assignments, which continues to affect the class's average score. The standard deviation of 46.16 indicates that the distribution of scores in Cycle II remains quite varied. However, this variation is primarily due to differences in student attendance and participation, rather than the failure of the learning model's implementation. Overall, the increase in the maximum score and the shift in the mode indicate that the critical thinking skills of students who actively participated in the learning process have developed significantly.

Overall, the descriptive statistical results for Cycle II indicate that implementing the Problem-Based Learning (PBL) model, accompanied by improvements in learning strategies, enhanced students' critical thinking skills. These results reinforce the finding that PBL is an effective learning model for encouraging students to think critically through problem-solving activities, discussions, and independent reasoning. Based on the results of the descriptive statistical analysis of students' test

scores in Cycle I and Cycle II, a picture of the changes in learning outcomes following the implementation of the instructional interventions was obtained. This analysis aimed to examine the development of students' average scores across cycles as an indicator of the success of the implemented interventions. The comparison of students' average learning outcomes in Cycle I and Cycle II is presented in the following graph.

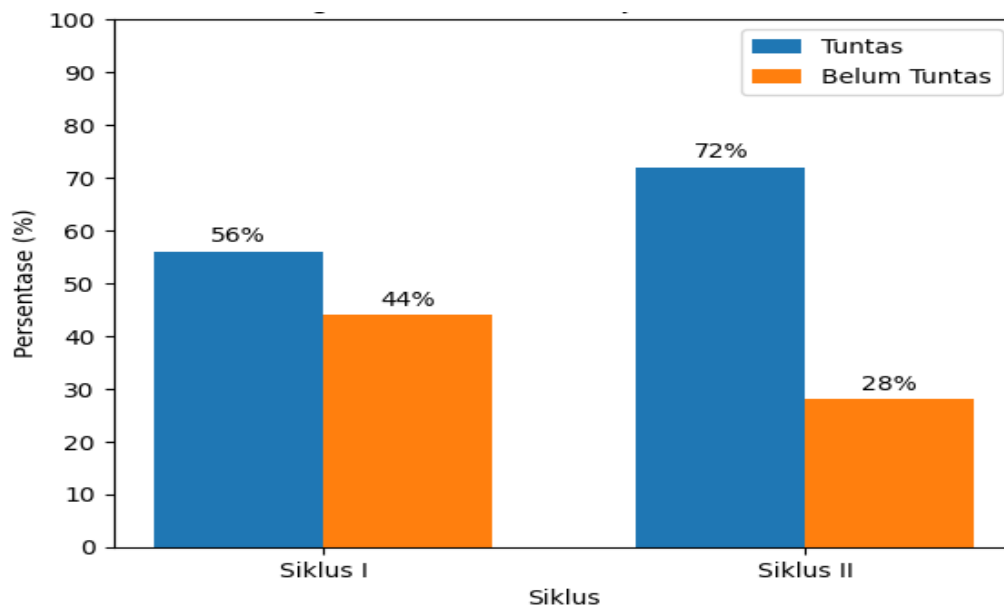


Figure 1. Comparison of Critical Thinking Test Results Between Cycle I and Cycle II

Based on the graph of students' critical thinking test results, there was an increase in the percentage of students who achieved mastery from Cycle I to Cycle II. In Cycle I, 56% of students achieved mastery, while in Cycle II, this figure rose to 72%. Conversely, the percentage of students who did not achieve mastery decreased from 44% in Cycle I to 28% in Cycle II. This increase in mastery and decrease in non-mastery indicate that implementing the Problem-Based Learning (PBL) model positively impacts students' critical thinking skills.

DISCUSSION

The Application Of The Problem-Based Learning (PBL) Model To Enhance The Critical Thinking Skills Of Third-Grade Students At Sdn 22 Jeppe'e

The implementation of Problem-Based Learning (PBL) has been proven to create a learning process that requires students to think actively and analytically. This approach is in line with constructivist theory, which emphasizes that knowledge is constructed through learning experiences and interactions with real-world problems. In *Educational Psychology Review*, it is confirmed that PBL effectively promotes students' cognitive engagement through contextual problem-solving processes. In the context of Islamic Religious Education (PAI) learning, the use of authentic problems enables students not only to receive material verbally but also to process it through reasoning and reflection on religious values. Based on the results of the students' critical thinking skills test in Cycle I, presented in Table 3, the average score was 56.8, with a learning achievement

rate of 56%, while 44% of students had not yet achieved the required level. The maximum score in this cycle was 80, with a median of 80 and a mode in the medium score category. These results indicate that students' critical thinking skills in Cycle I were still suboptimal and uneven, meaning that some students still struggled to identify problems, provide reasons, and draw conclusions from the problems presented.

The improvement in students' ability to identify problems, provide reasons, and draw conclusions indicates that PBL contributes significantly to the development of critical thinking skills. These findings are consistent with the study " , which states that PBL encourages students to explore information in depth through guided inquiry and reflective discussions. A study (Fuad et al., 2017) A study of elementary school students also showed that problem-based learning positively affects critical thinking skills, as students are trained to analyze problems and construct logical arguments. After implementing improvements to the instructional practices, the test results from Cycle II, shown in Table 5, indicate an improvement in students' critical thinking skills. The average score rose to 58.4, an increase of 1.6 points from Cycle I. The percentage of students meeting learning standards increased from 56% to 72%, while the percentage of students not meeting the standards decreased from 44% to 28%. The maximum score in Cycle II rose to 100, with the median remaining at 80 and the mode increasing to 100, indicating that the scores most frequently achieved by students fell into the "very good" category.

The improvement in learning outcomes in Cycle II was due to instructional improvements, such as clearer problem presentation, more structured discussion management, and more equitable guidance provided to all groups. These improvements made group work more effective and increased student engagement. This aligns with the study. , which emphasizes that problem clarity and teacher scaffolding are key factors in the success of PBL. The study " , conducted in the context of in Indonesian elementary schools, also demonstrates that targeted teacher guidance in PBL can improve the quality of student discussions and collaboration. In addition to improving critical thinking skills, the implementation of PBL also leads to a decrease in the number of passive students and an increase in student participation in learning. The PBL model provides students with the space to actively express their opinions, ask questions, and respond to their peers' ideas. These findings align with the results of the study " , which concluded that PBL can significantly increase student engagement and participation in learning.

The findings of this study are consistent with previous studies showing that PBL improves the quality of discussions and learning outcomes among elementary school students. A study titled " indicates that implementing PBL significantly enhances students' critical thinking skills and learning achievement. This study is novel in that it applies PBL to Islamic Religious Education (IRE) content, specifically the topics of Fasting and the Wisdom of Fasting, which have traditionally been taught primarily through lectures. Most PBL studies over the past 10 years have focused primarily on science and mathematics. Therefore, the results of this study expand the empirical literature on the application of PBL in Islamic Religious Education (IRE) and demonstrate that PBL is flexible and relevant for religious education.

Overall, this discussion shows that implementing PBL not only improves students' learning outcomes but also enriches their learning experiences through a more reflective, meaningful, and valuable process. Thus, PBL has proven effective in developing critical thinking skills among elementary school students, consistent with findings from journals over the past decade, and offers a new contribution to the development of Islamic Religious Education (PAI).

CONCLUSION

The implementation of classroom action research over two cycles demonstrated that Problem-Based Learning (PBL) effectively enhanced the critical thinking skills of third-grade students at SDN 22 Jeppe'e. Improvements to the learning stages in Cycle II included strengthening teacher guidance, presenting problems in a more structured manner, and using supporting media to motivate students to think more actively, express their opinions, and draw conclusions individually. These findings confirm that the success of PBL is determined not only by the model itself but also by the quality of its implementation in the classroom. Furthermore, this study demonstrates that PBL has the potential to be a highly effective approach to teaching Islamic Religious Education, particularly for the topics of Fasting and the Wisdom of Fasting, thereby fostering critical thinking among elementary school students.

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