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The Effect of the Problem Based Learning Model on Critical Thinking Skills in Indonesian Language Learning for Grade IV Students

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Abstract: This research aims to investigate the application of the Problem-Based Learning (PBL) model and its impact on the critical thinking abilities of fourth-grade students. A mixed-method design was employed, utilizing a quasi-experimental one-group pretest-posttest format. Data were gathered through interviews, observations, questionnaires, documentation, and critical thinking assessments. Data analysis followed a Sequential Exploratory strategy, beginning with the collection of qualitative data and subsequently proceeding to quantitative analysis. The implementation of PBL was conducted in six structured sessions, which included icebreakers, group discussions, text analysis, sentence construction, story writing, and presentations. Results showed that PBL enhanced students' participation, motivation, self-confidence, and critical thinking skills, particularly in identifying problems, analyzing information, drawing logical conclusions, evaluating solutions, and communicating ideas. Quantitatively, the average pre-test score of 61.87 increased to 71.13 in the post-test, with a significant difference ($t = -6.038$; $p < 0.05$). Therefore, PBL positively influenced learning outcomes and fostered critical, creative, communicative, and collaborative competencies in language learning.
Keywords: Critical thinking skills, Indonesian language learning, problem-based learning

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A. Introduction

In the 21st century, the world is experiencing rapid and complex changes, marked by advancements in information technology, globalization, and increasingly diverse social dynamics. These changes require every individual, especially the younger generation, to possess strong critical thinking skills in order to face various challenges and make appropriate decisions in different situations (Muliastrini, 2020). Critical thinking is one of the core skills within the 21st-century learning framework, commonly referred to as the 4C: Critical Thinking, Creativity, Communication, and Collaboration (Lutfi et al., 2024). Critical thinking enables students to analyze information in depth, evaluate arguments, solve problems systematically, and make decisions based on evidence and rational logic.

In the context of education, particularly in Indonesian language learning, critical thinking skills are essential because language serves not only as a communication tool (Habibi et al., 2023), but also as a medium to develop understanding, express ideas, and construct logical arguments. With strong critical thinking abilities, students can be more active in the learning process, critically comprehend reading materials, and express opinions in a structured and convincing manner (Aziz et al., 2024; James and Selvam, 2024). Therefore, the development of critical thinking skills has become an urgent necessity in today's education system. Learning that focuses solely on rote memorization and passive mastery of material is no longer sufficient to prepare students for the demands of the 21st century (Tansliova et al., 2025). Learning models that stimulate critical thinking, such as PBL, are highly relevant to implement, as they enable students not only to master the material but also to think critically and creatively in solving problems (Darwis et al., 2025).

According to Ennis (1996), critical thinking indicators encompass the ability to provide straightforward explanations, build fundamental skills such as verifying the reliability of information sources, apply deductive and inductive reasoning, interpret results, and formulate conclusions with additional clarification. He describes this as "reasonable and reflective thinking directed toward deciding what to believe or do." Meanwhile, Facione, through the California Critical Thinking Skills Test, identifies six essential critical thinking skills: interpreting, analyzing connections among ideas, evaluating credibility of information, making inferences or conclusions from evidence, expressing ideas effectively, and finally, monitoring and reflecting on one's own thought process.

Indonesian language learning is one of the subjects that plays a crucial role in developing students' language competence, thinking skills, and communication abilities (Atikah et al., 2024). However, in many elementary schools, including MI Mambaul Ma'arif Banjarwati Paciran, teaching Indonesian still faces several challenges. Many students tend to be passive during the learning process, which limits classroom interaction and reduces opportunities to develop critical thinking skills.

Additionally, students often struggle to express their ideas orally or in writing, indicating low communication skills and difficulty in expressing opinions. Another challenge relates to text analysis, where some students are not accustomed to understanding, evaluating, and drawing conclusions from the provided reading materials. As a result, the learning process remains focused on rote memorization or copying materials, rather than problem-solving and reflective thinking (Fahmi et al., 2021; Wattimena, 2018). This condition aligns with the criticism of traditional pedagogy by Paulo Freire, who described it as the "banking system of education," where teachers merely transfer knowledge passively, preventing the development of students' critical and reflective thinking (Mahur et al., 2019).

Critical pedagogy emphasizes that learning should empower students to actively analyze, question, and understand the meaning behind the information they receive (Prastowo, 2020). In the context of text analysis, this approach encourages students not

only to comprehend the content but also to evaluate arguments, relate them to personal experiences and real-world contexts, and draw independent conclusions (Rizal, 2025). Therefore, implementing learning models aligned with critical pedagogy, such as PBL, is highly relevant to address these challenges. PBL promotes reflective, active, and critical thinking, transforming students from passive recipients of information into empowered and critical learners (Rizal, 2025).

This condition underscores the importance of adopting learning models that foster students' active, creative, and critical thinking, thereby ensuring that their language competence evolves beyond mere content mastery into higher-order thinking skills. PBL is a learning model that centers the learning process around problem-solving (Fatirul and Winarto, 2018). PBL is designed to encourage students to learn actively through problem identification, information gathering, analysis, and formulation of relevant solutions (Sutiah, 2020). Its fundamental principles include student-centered learning, active participation, collaboration among students, and the development of higher-order thinking skills, including critical and creative thinking (Maharotunnisa et al., 2025).

The implementation of PBL is considered essential in education, as its structure is closely aligned with fostering the development of critical thinking skills. In the problem-orientation stage, students are trained to provide simple explanations and make interpretations, as emphasized by Ennis and Facione. When conducting investigations through group work and independent study, they build fundamental skills by verifying the validity of information and analyzing relationships between ideas. The solution formulation and presentation stages encourage students to deduce, induce, draw conclusions based on evidence, and convey the results of their thinking clearly and logically. Finally, in the reflection stage, students are trained to self-evaluate their solutions and thought processes, which aligns with self-regulation indicators. Thus, the PBL syntax, integrated with Ennis and Facione's critical thinking indicators, ensures that learning is not only oriented towards mastery of the material but also fosters rational, reflective thinking skills that focus on sound decision-making.

The advantages of PBL are evident in its ability to stimulate students' curiosity, enhance communication skills, and foster analytical and reflective thinking in addressing real-life problems. Students are not merely passive recipients of information but are challenged to process, evaluate, and apply knowledge in meaningful contexts. Thus, PBL develops not only cognitive skills but also social and emotional abilities, which are essential for 21st-century learning.

This study relates to prior research by Dhea Fatar Kiranadewi and Agustin Tyas Asri Hirdini, which compared the effectiveness of Problem-Based Learning (PBL) and Problem-Solving models in developing critical thinking skills in Civics education. Their research revealed that students taught with the PBL model showed greater improvements in critical thinking, achieving an average score of 80.00, compared to 69.50 for those taught with the Problem-Solving model. This evidence shows that PBL more effectively supports the enhancement of students' critical thinking abilities.

Implementing the PBL approach in Indonesian language instruction at MI Mambaul Ma'arif Banjarwati is expected to generate meaningful benefits and serve as a valuable tool for teachers to assess and refine teaching strategies that may still be less effective. This research holds significant urgency, as current classroom observations reveal that students often remain passive, struggle to articulate their ideas, and rely predominantly on rote memorization during Indonesian language lessons. Enhancing students' critical thinking abilities not only improves their learning outcomes but also contributes to the advancement of sustainable education, preparing them to meet the demands of the 21st century. In light of these considerations, this study focuses on implementing the PBL model at MI Mambaul Ma'arif Banjarwati Paciran Lamongan and examining its influence on students' achievement in Indonesian language learning.

B. Method

This research employed a mixed-methods approach that integrated both qualitative and quantitative techniques, utilizing a quasi-experimental quantitative design. The specific design utilized was a one-group pretest-posttest format, where only one experimental class was examined without the inclusion of a control group. A pre-test was administered prior to the intervention (Oda Kianata Banurea, 2018), while a post-test was conducted after the application of the PBL model. This study was carried out over six sessions at MI Mambaul Ma'arif Banjarwati Paciran. The analysis employed a Sequential Exploratory approach, beginning with qualitative data collection and analysis, and continuing with quantitative data collection and analysis in the subsequent stage.

The study was conducted at MI Mambaul Ma'arif Banjarwati, Paciran, Lamongan, a location chosen due to the students' level of critical thinking identified in previous research, which indicated a need for instructional improvement. The research subjects consisted of all fourth-grade students, totaling 23 participants (12 male and 11 female). The study involved two variables: the independent variable, which was the PBL model, and the dependent variable, which was students' critical thinking ability. Data were collected through interviews to gather initial information about the learning process, classroom observations, questionnaires to capture students' responses, documentation, and critical thinking tests consisting of pre-test items administered before the PBL intervention and post-test items administered afterward on the narrative text material in Indonesian language lessons. Using the one-group pretest-posttest design (Chofifah et al., 2023; Creswell, 2018), the study provided a pre-test (O1) to the group before the PBL implementation, followed by a post-test (O2) after the PBL application.

Prior to implementation, a PBL instructional module was developed as a reference. This module was designed based on indicators and learning outcomes related to critical thinking skills (see Table 1). The research framework for the pretest–posttest design, which incorporates the implementation of PBL and the integration of modules with critical thinking activities, is presented in Figure 1.

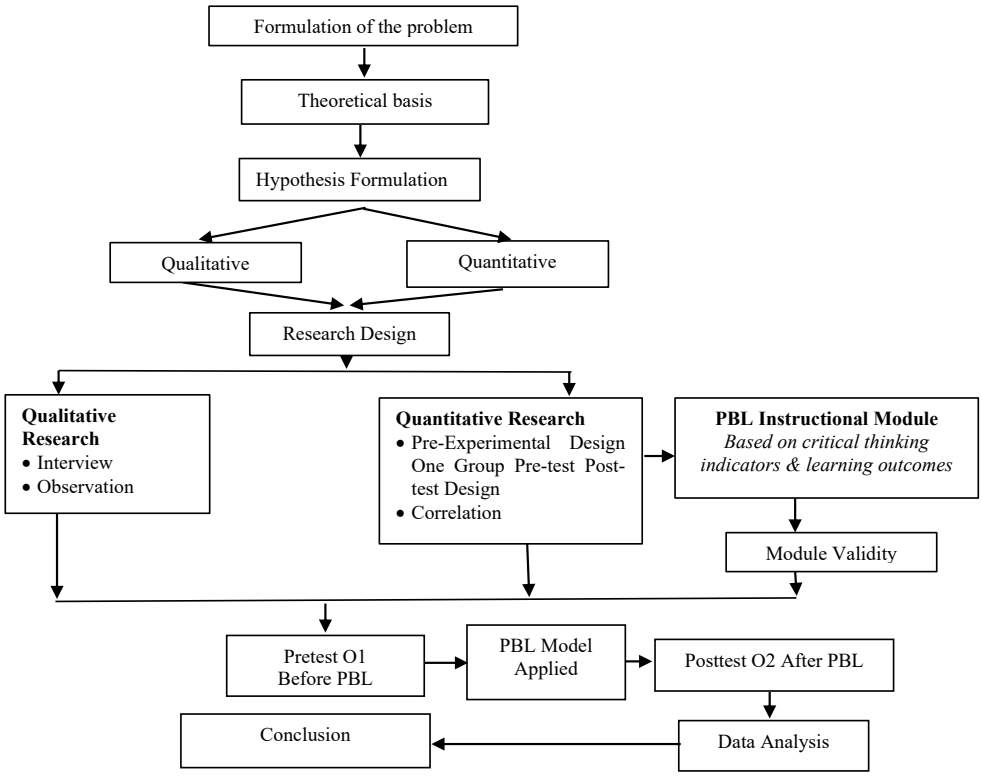

Figure 1. Research Flow

Table 1. Integration Module with Critical Thinking Activities

PBL model	Critical thinking indicators	Student activities
Pre-test & Problem Orientation	Interpretation, Clarification	Students worked on the pre-test; some had difficulty understanding questions, asked for clarification
Introduction to PBL & Problem Observation	Interpretation, Analysis, Evaluation, Collaboration	The teacher presented a narrative text using images as the medium; ice-breaking; students were divided into groups for student worksheet discussions; presentation of discussion results.
Discussion & Simple Sentence Making	Analysis, Inference, Explanation	Students read the text, made two simple sentences based on the text, presented the results
Story Writing & Presentation	Inference, Explanation, Self-regulation	Students wrote narrative stories based on personal experiences; presentations & feedback between groups
In-depth Text Analysis & Discussion	Analisis, Evaluation, Explanation, Inference	Students analyzed texts with guided questions, group discussions, writing answers, providing input & evaluations to friends.
Post-test & Reflection	Self-regulation, Explanation, Inference	Students completed a post-test; compared answers before and after PBL; reflected on the learning process

The pretest and posttest items were validated using the Pearson Product-Moment correlation formula (Creswell, 2018) which measures the direction and strength of the

relationship between the independent variable (X) and the dependent variable (Y) (Edmonds and Kennedy, 2017). The test items were validated on non-respondent students and proven to be valid and reliable (Khoiriyah et al., 2019), ensuring their suitability for fourth-grade students at MI Mambaul Ma'arif. Furthermore, hypothesis testing was conducted using a Paired Sample t-Test to determine the significance of differences between pretest and posttest scores (Rahmawati et al., 2024).

C. Results and Discussion

Results

Implementation of the PBL model for fourth grade students at MI Mambaul Ma'arif

This study was conducted over six sessions at MI Mambaul Ma'arif Banjarwati Paciran. In the first session, students were given a pre-test to assess their initial abilities before the implementation of the PBL model. During the activity, it was observed that several students had difficulty understanding the questions provided. Some students asked for clarification, indicating gaps in comprehension, while others appeared less engaged, occasionally participating in off-task activities. This initial observation highlighted the students' need for structured guidance and interactive learning strategies to support their understanding and engagement. *"Ma'am, what does the question mean?".* Meanwhile, some other students appeared less focused, engaging in other activities such as drawing or chatting with their friends. It indicated that at the beginning of the learning process, students' interest and motivation were still low, which was reflected in their relatively low pre-test scores.

In the second session, learning was conducted using the PBL model. The teacher began the activity with greetings and a collective prayer, followed by an ice-breaking activity to create a pleasant classroom atmosphere. The narrative text material was introduced using picture media, and students were asked to observe the images and answer related questions. Afterward, the students were divided into small groups to discuss the tasks provided in the student worksheets. They then presented the results of their discussions in front of the class, while other groups provided feedback. In this session, most students appeared enthusiastic, although some were still less focused. A few students also expressed complaints about the attitudes of their group members, highlighting the need for guidance in collaborative learning. *"I enjoy discussing with my friends, but some of my friends are still playing around."*

The third session showed that students were beginning to adapt to the PBL model. The material focused on types of narrative texts, with examples such as "Perang Surabaya" and "Pertarungan di Pagi Buta." The teacher started the session with greetings, a collective prayer, and an ice-breaking activity, followed by stimulating questions to recall previous lessons. Students were divided into groups, read the texts, and created two simple sentences based on the texts they had read. They then presented the results of their discussions to the class. In this session, students appeared more confident and attentive, with some even demonstrating the ability to draw independent conclusions.

In the fourth session, students' abilities continued to show further improvement. The material covered the structure of narrative texts, their purpose, and the steps involved in composing them. The teacher displayed several images to spark ideas and asked students to write narrative stories based on their personal experiences. Later, they presented the stories to the class, and other groups provided feedback. Most students were brave in presenting their stories, although a few remained shy, reflecting individual differences in confidence and willingness to participate. These students argued, *"I do not want to come forward; I am embarrassed".* This activity also trained students to think critically, as they were required to explain the meaning of their stories and relate them to their personal experiences.

The fifth session showed an increasing level of student enthusiasm. They analyzed narrative texts using guided questions, discussed in groups, and wrote answers under the teacher's guidance. Students then presented their discussion results, provided suggestions, and evaluated their peers' presentations. This process encouraged them to think, discuss, and express their opinions critically and actively. In the sixth session, students were given a post-test to measure their critical thinking abilities after the PBL implementation. The post-test results showed a significant improvement compared to the pre-test. Students appeared more active, engaged in the learning process, and more confident in presenting their answers.

In general, applying the PBL model in the fourth-grade class at MI Mambaul Ma'arif Banjarwati Paciran was shown to be effective in improving students' critical thinking abilities. The advantages of this model include fostering independent problem-solving, active group discussions, sharing personal experiences, and presenting discussion results in front of the class. However, some challenges remained, such as certain students struggling to express their stories properly in Indonesian and limited opportunities for all students to provide explanations due to time constraints.

The findings indicate that PBL is highly suitable for teaching Bahasa Indonesia in fourth grade, as it not only actively engages students but also encourages them to think critically, independently, and creatively. With consistent teacher guidance and model implementation, students were able to improve their understanding of the material, communication skills, and confidence in expressing their opinions and personal experiences.

The influence of the PBL model on critical abilities of grade 4 students at MI Mambaul Ma'arif Banjarwati Paciran

The researchers applied observation and testing techniques to collect data on whether the PBL model affects the critical thinking abilities of fourth-grade students in Bahasa Indonesia at MI Mambaul Ma'arif Banjarwati Paciran. The test was administered to 23 students who served as research respondents. The test instrument consisted of 18 items developed based on critical thinking skill indicators, with each item having its own scoring criteria according to the correct answers. The results of the test administered to

the students were then processed and presented in tabular form to illustrate the level of students' critical thinking abilities. The processed data can be seen in Table 2.

Table 2. Pretest and Posttest Test Result Scores

Student number	Pre-Test	Post- Test	N-Gain	Category
1	65	70	0.14	Low
2	56	61	0.11	Low
3	82	82	0.00	Low
4	76	87	0.46	Moderate
5	67	77	0.3	Low
6	44	49	0.09	Low
7	61	71	0.26	Low
8	70	76	0.02	Low
9	54	60	0.13	Low
10	72	82	0.36	Moderate
11	71	88	0.59	Moderate
12	77	83	0.26	Low
13	47	72	0.47	Moderate
14	42	48	0.01	Low
15	50	55	0.01	Low
16	66	81	0.44	Moderate
17	55	73	0.04	Low
18	49	49	0.00	Low
19	79	84	0.24	Low
20	51	78	0.55	Moderate
21	49	49	0.00	Low
22	62	67	0.13	Low
23	78	94	0.73	High
Average score	**61.87**	**71.13**	**0.26348**	**Low**

Based on Table 2 and Figure 2, in the pretest, student number 14 obtained the lowest score of 41. Out of a total of 23 students, the average score was 61.87, indicating that students' critical thinking skills were still relatively low. Although categorized as low, the implementation still demonstrated a noteworthy improvement in the results. Furthermore, in the posttest, student number 14 again achieved the lowest score, with a score of 48. However, the overall average increased to 71.13 from the previous 61.87. Although students' critical thinking skills remained low, these results showed a 9.26-point improvement.

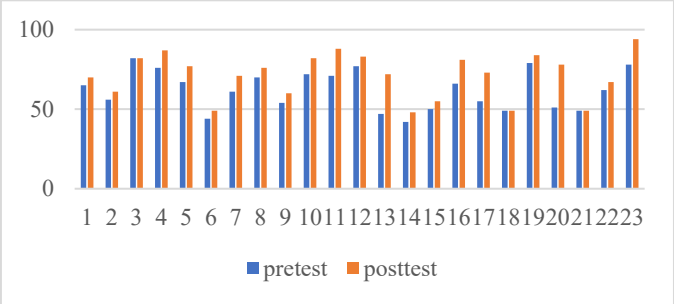

Figure 2. Comparison Chart of Pretest and Posttest Scores

Table 3. Hypothesis Test Results

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Pre-test - pos-ttest	-9.261	7.356	1.534	-12.442	-6.080	-6.038	22	.000

Based on Table 3, the results of the Paired Sample t-Test conducted between the pretest and posttest scores revealed a mean difference of -9.261, with a standard deviation of 7.356 and a standard error mean of 1.534. The 95% confidence interval for the mean difference ranged from -12.442 to -6.080. Since this interval does not include zero, the difference between the pretest and posttest results can be considered statistically significant and not attributable to random chance. This evidence strongly suggests a notable improvement in students' performance following the intervention.

The analysis further revealed that the calculated t-value reached -6.038, with a degree of freedom (df) of 22. Meanwhile, the significance value was recorded at 0.000, which is lower than the alpha level of 0.05. This result demonstrates that the difference between the pretest and posttest scores is highly significant in statistical terms. From these findings, it can be concluded that there was a measurable improvement in students' average performance after the application of the learning model. Specifically, the average ability of students to think critically increased by 9.261 points. This increase indicates that the PBL model applied in this study was effective in strengthening students' critical thinking skills, as it successfully facilitated meaningful learning experiences that allowed learners to analyze, evaluate, and reflect more deeply during the learning process.

Discussion

Implementation of the PBL model for fourth grade students at MI Mambaul Ma'arif

This study was conducted over six sessions in the fourth grade at MI Mambaul Ma'arif Banjarwati Paciran, implementing the PBL model in Indonesian language lessons. In the first session, students were given a pretest to assess their initial abilities in critical thinking skills.

The initial results showed that some students had difficulty understanding the questions and tended to be less motivated, with many engaging in other activities. This phenomenon aligns with Messerer et al. (2023), which emphasizes that intrinsic motivation is crucial in learning. Without appropriate encouragement, students do not demonstrate optimal participation. Additionally, Skinner's behaviorism theory indicates that learning responses are influenced by reinforcement; the teacher's limited attention in explaining the material before the pretest reduced positive reinforcement for the students, resulting in low initial scores (Pratama, 2019).

In the second session, the implementation of PBL began with an icebreaker activity to create a conducive classroom atmosphere, followed by an introduction to narrative text material through explanations, image observation, and a question-and-answer session. Next, students were divided into small groups to discuss the student worksheet and present the results of their discussions. This stage reflects the core elements of PBL: encouraging students to actively construct knowledge, negotiate meaning through group discussions, and communicate their findings. According to the critical thinking theory put forward by Ennis and Facione, activities that involve the process of asking questions, analyzing information, and presenting arguments can develop students' ability to evaluate evidence, generate alternative solutions, and make reasoned decisions.

Not only that, these activities encouraged social interaction and collaboration, in line with Piaget's constructivist theory (Smith et al., 1997), in which students build knowledge through active experiences, and supported Vygotsky's zone of proximal development (Messerer et al., 2023), which emphasizes guidance from teachers and peers to enable students to achieve a higher level of understanding than their initial independent ability (Qiptiyah, 2024). Although most students were enthusiastic, some remained less focused, indicating that not all students immediately adapted to the new model.

The third session showed that students were increasingly adapting to the PBL model. The material covered types of narrative texts with concrete examples, followed by group discussions to construct simple sentences. The session concluded with presentations of the discussion results and reflection activities. These activities not only developed critical thinking skills but also enhanced communication and collaboration abilities, in accordance with Bandura's social cognitive theory (Fatirul and Winarto, 2018), which emphasizes that learning occurs through observation, modeling, and social interaction (Arozatulo Telaumbanua, 2025). The use of guiding questions before introducing new material also supports Ausubel's schema theory, which states that new knowledge is more easily assimilated when connected to students' prior knowledge (Chakraborty and Esposito, 2024; Richards et al., 2020). As a result, students began to listen attentively, draw conclusions, and present the material effectively. In relation to critical thinking theory, this stage reflects the process of identifying problems, analyzing information, drawing logical inferences, and systematically communicating results. This confirms that the implementation of PBL can stimulate higher-order thinking skills through reflective discussions, problem-solving, and the presentation of learning outcomes.

The fourth session focused more on the structure of narrative texts, their purpose, and the steps for composing them. Students created narrative texts based on their personal experiences, presented them in front of the class, and received evaluations from their peers. This activity enhanced students' critical thinking skills, creativity, and confidence in expressing ideas (Abdurrahmansyah, 2023). From an educational psychology perspective, this aligns with Piaget's theory of concrete and formal operational thinking in children aged 10–12 (Anwar, 2017), where students begin to analyze and evaluate information. Additionally, Vygotsky's constructivist theory supports the idea that social

interaction and group discussions facilitate the internalization of knowledge (Azzahra et al., 2025). The students' presentations, with some being confident and others more hesitant, also reflect individual dynamics in line with Bandura's self-efficacy theory (Utami, 2017), where self-confidence influences students' performance and engagement.

This activity, situated within the framework of PBL, illustrates its fundamental concepts, which highlight learning through problems to develop students' critical thinking, innovative problem-solving, and communication skills. The process of creating narrative texts, constructing sentences based on personal experiences, and presenting them enables students to identify problems, analyze information, draw conclusions, and evaluate both their own work and that of their peers all of which are indicators of critical thinking as defined by Ennis and Facione. Thus, the implementation of PBL not only improves critical thinking skills, but also builds students' social, collaborative, and self-confidence skills in an active learning context.

In the fifth session, students became increasingly active in analyzing narrative text questions using the FRISCO critical thinking indicators, engaging in group discussions, and presenting their results. This activity emphasized problem-based learning, which encourages students to find alternative solutions. In line with Dewey's experiential learning theory (Kolb, 1984), this activity demonstrates the optimal application of PBL, as students not only receive information but also identify problems, evaluate data, and find alternative solutions. This is consistent with the main principles of PBL, which highlight problem-based learning as a way to foster critical thinking, creativity, and communication abilities.

PBL requires students to actively observe, analyze, formulate hypotheses, and evaluate the results, which strengthens their critical thinking skills. This highlights learning through experience and reflection. PBL also facilitates active learning, enhances intrinsic motivation, and develops critical and collaborative thinking skills, which is also supported by Bruner's discovery learning theory (Asri et al., 2024), where students learn by discovering concepts through interaction with materials and their environment. The students' motivation and active participation demonstrate that PBL integrates cognitive, affective, and social aspects, making learning not only transactional but also transformational (Kartini et al., 2022).

In the sixth session, these findings reinforce the effectiveness of PBL in enhancing students' critical thinking skills, autonomy, and confidence. Furthermore, the results align with Putri's study, which also showed that problem-based learning has a significant positive impact on learning outcomes. PBL is also aligned with Piaget and Vygotsky's constructivist theories, which assert that students construct knowledge through active experiences and social interactions (Muhibbin and Hidayatullah, 2020), as well as Dewey's educational psychology theory, emphasizing learning through experience, reflection, and real problem-solving. Thus, statistical data support that the implementation of PBL not only improves academic scores but also significantly develops students' critical thinking competencies, problem-solving abilities, and self-confidence.

The analysis of PBL implementation reveals substantial benefits in enhancing students' competencies, especially in critical thinking, teamwork, and communication. Students' success in independently solving problems and actively engaging in discussions aligns with the principles of constructivist learning theory proposed by Piaget and Vygotsky (Sariani et al., 2024), in which knowledge is built through social interaction and real experiences. PBL encourages students to engage in active learning, solving problems relevant to real-life contexts (Ali, 2019), making the acquired knowledge more meaningful and applicable in daily life, in accordance with Ausubel's constructivist theory, which emphasizes linking new information with existing cognitive schemas (Musi and Nurjannah, 2021).

Moreover, students' ability to share experiences and present solutions in front of the class supports Bandura's social learning theory (Muslim et al., 2024), where learning occurs through observation, imitation, and group interaction. Students not only learn from the teacher but also from peers, reinforcing learning through modeling and peer teaching (Alkan et al., 2025).

However, some limitations emerged, such as students' limited language skills and insufficient opportunities to explain their ideas to peers, which can be analyzed through Vygotsky's zone of proximal development (ZPD) theory (Sariani et al., 2024). These limitations indicate that some students are not yet able to reach their full potential without adequate scaffolding (Suardipa, 2020). This underscores the need for teachers to provide additional support, such as language guidance, communication exercises, and structured group arrangements that allow all students to participate actively (Suardipa, 2020). PBL is effective in developing cognitive, social, and communicative skills, but its implementation requires pedagogical strategies that support all students to achieve optimal learning outcomes..

The influence of the PBL model on critical abilities of grade 4 students of MI Mambaul Ma'arif Banjarwati Paciran

This research shows that implementing PBL contributes positively to the development of students' critical thinking abilities. From a theoretical standpoint, this can be understood through the lens of constructivism, which highlights that learners actively build their knowledge through meaningful learning experiences. In PBL, students do not merely receive information passively but are confronted with real-life problems that require them to analyze, evaluate, and make decisions. These activities are aligned with indicators of critical thinking, such as providing reasons based on evidence, drawing conclusions, and evaluating arguments (Hmelo-Silver, 2004).

The PBL model is very suitable for application in Indonesian language learning for fourth-grade students at MI Mambaul Ma'arif Banjarwati Paciran. This model trains students to actively solve problems, become independent, and engage in continuous learning. This is in line with research conducted by A'yun and Wardani (2025), who stated that the PBL model is also consistent with constructivist theory in that students are able to create knowledge and meaning from the interaction of ideas and experiences they

have gained, while also being given the freedom to develop their own abilities . The influence of the PBL model encourages students to play a more active role in learning, engage in discussions, and practice the material they have learned, as well as explain the reasoning behind their actions. This process contributes to the improvement of students' thinking outcomes. These findings are supported by research showing that motivating students fosters enthusiasm in learning, particularly in discussions and practicing material (Agrifina et al., 2024).

Furthermore, the PBL model is effective because it provides space for students to collaborate, discuss, and reflect on ideas. Group discussion processes stimulate critical questioning, concept clarification, and the exchange of perspectives that enrich students' understanding. This aligns with Vygotsky's view of the importance of social interaction in developing higher-order cognitive abilities. Several studies have also shown that collaborative discussions in PBL can foster argumentation and problem-solving skills, which are central to critical thinking. These findings reinforce research indicating that in the problem-analysis phase of PBL, collaborative processes such as question and answer, co-construction, and sharing ideas or information are highly dominant and strongly support the empowerment of students' critical thinking (Li and Nurbiha A Shukor, 2023; Xu et al., 2023).

Further analysis reveals that the improvement in students' critical thinking skills occurs because PBL encourages them to actively solve real-world problems, collaborate in groups, and explore answers from multiple sources. The characteristics of fourth-grade students, typically aged 10–13 years, include a high level of curiosity, but they are not yet accustomed to presenting arguments or responding to arguments (Hayati and Setiawan, 2022). Given these characteristics, the implementation of the PBL model can enhance critical thinking skills by enabling students to engage in group discussions, seek answers, and make decisions regarding the problems presented.

The study's outcomes correspond with previous evidence showing that PBL is reliably more effective than standard teaching methods in developing critical thinking. For example, research by Anggraeni et al. (2023) supports these results, demonstrating an increase in critical thinking abilities through the PBL model. Similar results were found in research by Sarimuddin Sumardi, which confirmed that the use of the PBL model led to improvements in both students' cognitive abilities and critical thinking skills (Sarimuddin et al., 2021).

Overall, the findings of this study affirm that PBL can be a relevant instructional strategy for enhancing students' critical thinking skills, particularly in the context of 21st-century learning, which demands analytical, collaborative, and reflective abilities. Therefore, the application of PBL in primary and secondary education can act as an instructional strategy to better equip students for future complex challenges.

D. Conclusion

The implementation of the PBL model for Grade 4 students at MI Mambaul Ma'arif Banjarwati Paciran was carried out effectively over six sessions. Initially, students showed low motivation, passive participation, and difficulty understanding questions. Through structured PBL activities—including icebreakers, group discussions, narrative text analysis, sentence construction, story writing, and presentations—students gradually became more active, collaborative, and confident. The PBL model encouraged students to think critically, creatively, and reflectively, while also enhancing their communication and collaboration skills. Observational findings revealed that students were increasingly able to identify problems, analyze information, draw logical conclusions, evaluate solutions, and present their ideas effectively, demonstrating the holistic development of critical thinking competencies in a real learning context.

The PBL model also had a significant impact on students' critical thinking abilities. Quantitative data showed that the average pre-test score of 61.87 increased to 71.13 in the post-test, an improvement of 9.26 points. The Paired Sample t-Test confirmed this increase as statistically significant, with a t-value of -6.038 and a significance value of 0.000 (< 0.05). Furthermore, qualitative analysis of classroom activities indicated that students developed key critical thinking skills, including problem identification, information analysis, logical reasoning, solution evaluation, communication, collaboration, and self-confidence. These findings demonstrate that PBL not only improves students' academic performance but also fosters active, reflective, and participatory learning behaviors, making it an effective model for developing comprehensive competencies in Indonesian Language learning.

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