



THE EFFECTIVENESS OF THE PROBLEM-BASED LEARNING MODEL IN ENHANCING STUDENTS' HIGHER-ORDER THINKING SKILLS AND LEARNING INTEREST

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ABSTRACT

This study aims to determine the effectiveness of the Problem-Based Learning model in improving higher-order thinking skills (HOTS) and students' learning interest in Social Studies. The population consisted of all seventh-grade students at SMP YLPI Marpoyan Pekanbaru, with the research sample consist of 37 students from class VII.2. Each cycle comprised four stages:planning, implementation, observation, and reflection. The research method used was Classroom Action Research (CAR) conducted in three cycles. Data were collected through observation, HOTS tests, learning interest questionnaires, interviews, and documentation. The HOTS test instruments were developed based on the revised Bloom's Taxonomy (C4, C5, C6), while the learning interest questionnaire employed a Likert scale. The results showed significant improvement in both aspects. The percentage of HOTS mastery increased from 18.92% in Cycle I to 56.76% in Cycle II, and reached 100% in Cycle III. Similarly, learning interest rose from 40% in Cycle I to 68% in Cycle II, and 95% in Cycle III. These findings indicate that the PBL model fosters active, contextual, and motivating learning experiences, encouraging students to think critically, analytically, and creatively. Therefore, the PBL model is recommended as an effective alternative instructional strategy to develop 21st-century competencies in both cognitive and affective domains, and to improve overall learning quality in the classroom.

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1. INTRODUCTION

21st-century education requires students to possess Higher Order Thinking Skills (HOTS) and a strong interest in learning in order to adapt to complex global challenges (Ariyana et al., 2018). HOTS encompasses the abilities to analyze, evaluate, and create, which are prerequisites for solving real-world problems creatively and innovatively (Anderson & Krathwohl, 2001; Husada et al., 2021). At the same time, learning interest plays an important role as a driver of intrinsic motivation that influences students' active engagement in the learning process (Slameto, 2020; Friantini & Winata, 2019).

However, various studies have shown that Indonesian students' HOTS achievement remains relatively low. The 2019 PISA report ranked Indonesia 74th out of 79 countries in reading, mathematics, and science literacy, indicating weak critical thinking skills among students (Hewi & Shaleh, 2020; Wahyudi et al., 2022). This condition is exacerbated by the dominance of conventional teacher-centered and memorization-oriented learning methods (Rumini, 2020; Supriatna, 2020). In Social Studies (IPS), learning is often not connected to real-life contexts, resulting in passive, unchallenged, and unmotivated students (Sapriya, 2009; Suginem, 2021).

One recommended strategy to address this problem is the implementation of the Problem-Based Learning (PBL) model. PBL places real-world problems as the starting point of learning, encouraging students to investigate, discuss, and develop solutions based on data analysis and logical reasoning (Hamid et al., 2022; Mustofa, 2021). Thus, PBL not only stimulates critical thinking skills but also increases students' curiosity and interest in learning through active involvement in problem-solving (Fitriyani et al., 2019; Hodiyanto, 2018).

PBL also has strong advantages in stimulating students' interest in learning. The problems presented in this model are generally directly related to students' real-life experiences, making learning more meaningful, relevant, and challenging. When students are confronted with engaging problems, they are naturally driven to be curious and motivated to explore further. Group discussions, collaboration, and presentation of results within the PBL framework also create a dynamic and interactive learning atmosphere, ultimately increasing students' enthusiasm and engagement. Thus, PBL is effective not only in improving cognitive learning outcomes but also in enhancing the affective aspects of student development.

In terms of higher-order thinking skills, the PBL model facilitates activities that require students to operate at higher cognitive levels. Based on Bloom's Revised Taxonomy by Anderson and Krathwohl, higher-order thinking skills include analyzing (C4), evaluating (C5), and creating (C6). The PBL process— which involves problem analysis, comparing alternative solutions, evaluating evidence, and formulating strategies—represents a concrete example of higher-order thinking skills. By providing appropriate intellectual challenges, this model encourages students to maximize their cognitive capacity.

Empirical research in various contexts confirms the effectiveness of PBL in improving HOTS. For example, Mustakim et al. (2025) reported that PBL significantly improves critical thinking, creativity, and problem-solving—key components of HOTS—in educational settings. Moreover, a quasi-experimental study conducted at a secondary school in Malaysia showed

that PBL significantly improved students' higher-order thinking skills compared to traditional methods (Ali et al., 2019).

In terms of affective outcomes, PBL also has a positive impact on students' interest and motivation to learn. A study on the topic of global warming in Indonesia showed a significant increase in both HOTS and students' learning interest after implementing PBL, as measured using N-gain and statistical significance (Kurniawan et al., 2025).

Students' interest in learning is influenced by various psychological and social factors. According to Slameto (2020), learning interest is an individual's tendency to pay attention to and actively engage in learning activities due to feelings of enjoyment, curiosity, and satisfaction. High learning interest encourages students to study diligently, follow lessons enthusiastically, and strive to understand and master the material. In PBL-based learning, students' learning interest emerges naturally because they are challenged to find solutions to relevant problems. Furthermore, participation in group discussions fosters positive social interactions and mutual support, which further strengthens students' self-confidence and motivation.

Many previous studies have demonstrated the effectiveness of PBL in enhancing HOTS and learning interest. Hodiyanto (2018) showed that PBL significantly improves students' mathematical HOTS. Fitriyani et al. (2019) reported that PBL increases students' collaboration and critical thinking skills. Mustofa et al. (2021) also found that STEM-based PBL is effective in improving critical thinking skills in science learning. These findings affirm that PBL is not merely a teaching method but a strategic approach aligned with the demands of 21st-century education.

A similar problem was also found at SMP YLPI Marpoyan Pekanbaru, particularly in the subject of Social Studies. Initial observations revealed that most students experienced difficulty understanding Social Studies material, especially on the topics of demand, supply, markets, and equilibrium prices. Only about 35% of students expressed interest in Social Studies, while the rest admitted disliking the subject because they found it difficult, boring, and irrelevant to everyday life. In addition, about 85% of students were unable to solve problem-based analytical questions, indicating weak higher-order thinking skills. These difficulties were compounded by the limited use of learning approaches that encourage active and reflective thinking.

This situation cannot be ignored. To address it, innovative learning strategies are needed to improve higher-order thinking skills while fostering students' interest in learning. One relevant and proven approach is the Problem-Based Learning model. This model is oriented towards solving real-world contextual problems as the starting point of learning. Students are encouraged to actively engage in identifying problems, formulating hypotheses, seeking information, analyzing data, and developing solutions based on their own understanding. PBL positions students as active participants in the learning process, rather than passive recipients of information. Thus, PBL directly fosters critical, logical, and creative thinking skills while building a sense of responsibility and learning independence.

Based on this background, this study aims to determine the effectiveness of the Problem-Based Learning model in improving higher-order thinking skills and learning interest

among junior high school students, particularly in Social Studies. This research uses a Classroom Action Research (CAR) approach conducted in three cycles, involving Grade VII.2 students at SMP YLPI Marpoyan Pekanbaru. Each cycle consists of planning, implementation, observation, and reflection stages, focusing on the systematic application of PBL syntax.

This research is expected to provide both theoretical and practical contributions in the field of education. Theoretically, it enriches the literature on the effectiveness of PBL in the context of Social Studies learning at the junior high school level. Practically, the results can serve as a reference for teachers in designing innovative learning strategies oriented toward developing 21st-century skills. For students, PBL is expected to increase motivation, independence, and critical thinking skills essential for future life. For schools, this research offers insights for formulating progressive and contextual learning policies. Overall, this study seeks to provide concrete solutions to learning problems that hinder the development of students' higher-order thinking skills and learning interest.

Given its strong cognitive and affective benefits, this research aims to examine the effectiveness of the PBL model in enhancing higher-order thinking skills and learning interest among Grade VII students in Social Studies at SMP YLPI Marpoyan Pekanbaru, using a three-cycle CAR approach.

Previous research has proven that PBL effectively improves critical thinking, problem-solving, and learning outcomes in various subjects. For example, Fitriyani et al. (2019) found that collaborative PBL-based worksheets (LKS) improved physics problem-solving skills. Mustofa (2021) reported that STEM-based PBL enhanced students' critical thinking in science learning. Meanwhile, Zulkarnain et al. (2021) showed that the SSCS-based PBL model improved mathematical problem-solving abilities and students' self-efficacy.

In addition to improving HOTS, PBL also contributes to enhancing learning interest. Febrianti et al. (2021) revealed that students' interest in learning increased when lessons were designed interactively and relevant to their needs. Muliani and Darmawati (2022) demonstrated that the use of learning media supporting PBL could create an enjoyable learning atmosphere, thereby motivating students more. These findings align with Hamdani's (2011) view that active student engagement in challenging learning activities fosters curiosity, self-confidence, and intrinsic motivation.

In this context, strengthening higher-order thinking skills (HOTS) becomes the primary goal of the educational process. These skills include the ability to analyze, evaluate, and create—high-level cognitive competencies essential for solving real-world problems independently and innovatively. On the other hand, students' learning interest is also a fundamental element in developing an effective and sustainable learning process. Students with high learning interest tend to be more diligent, focused, and active in exploring knowledge and participating in the learning process.

Based on this background, this study aims to analyze the effectiveness of implementing the PBL model in enhancing HOTS and learning interest in Social Studies at the junior high school level. The research is conducted in the form of CAR over three cycles, focusing on the systematic application of PBL syntax. The results of this study are expected to provide

theoretical contributions by strengthening the literature on PBL implementation in Social Studies learning, as well as practical contributions as a reference for teachers in designing innovative learning that integrates HOTS development with the enhancement of students' learning interest.

2. RESEARCH METHODS

This study is a Classroom Action Research aimed at improving students' higher-order thinking skills and learning interest through the implementation of the Problem-Based Learning (PBL) model in the Social Studies subject. This classroom action research is designed based on the Kemmis and McTaggart model, which includes four main stages in each cycle: planning, action implementation, observation, and reflection. The study was conducted in three cycles, each consisting of two meetings.

The research was carried out at SMP YLPI Marpoyan Pekanbaru during the odd semester of the 2024/2025 academic year. The population of this study consisted of all seventh-grade students, while the sample targeted for the action was class VII.2, consist 32 students. This class was selected based on initial observations that indicated a low level of active participation, learning interest, and critical thinking ability in Social Studies learning. Furthermore, the subject teacher identified class VII.2 as having representative characteristics suitable for intervention in this action research.

The researcher was directly and actively involved in the activity. The researcher acted as the subject teacher as well as the controller of the actions conducted during the learning process. In implementation, the researcher was assisted by a collaborating teacher who served as an observer, recording student and teacher activities throughout the learning sessions. This collaboration aimed to obtain objective and comprehensive data from multiple perspectives. The study took place in classroom VII.2 at SMP YLPI Marpoyan Pekanbaru over a period of three weeks, from October 22 to November 7, 2024.

Data collection in this study employed several techniques, including observation, tests, questionnaires, interviews, and documentation. Observation was used to monitor students' learning activities and teacher performance during the learning process, particularly in implementing the Problem-Based Learning model. The observation sheets were developed based on indicators of active student engagement and the steps of PBL implementation. Tests were used to assess students' higher-order thinking skills before and after the action. The test instruments were designed according to a blueprint referencing the higher cognitive domains of the revised Bloom's Taxonomy, namely C4 (analyzing), C5 (evaluating), and C6 (creating). The questions were in multiple-choice format with contextual stimuli that required critical and analytical thinking.

Questionnaires were used to measure students' learning interest in Social Studies. The instruments consisted of closed statements based on indicators of learning interest, such as attention, enjoyment, active participation, and perseverance in learning. A four-point Likert scale was used, ranging from strongly agree to strongly disagree. To gather deeper insights, semi-structured interviews were conducted with several students and the subject teacher. The interviews aimed to explore their perceptions, impressions, and responses toward the application of the PBL model in Social Studies learning.

The data analysis techniques employed in this study included quantitative and qualitative descriptive analysis. Quantitative data, obtained from tests and questionnaires, were analyzed using percentage of learning mastery and the average score improvement. Improvements in higher-order thinking skills were analyzed based on pretest and posttest

results from each cycle, while improvements in learning interest were analyzed using the questionnaire results administered before and after each cycle. The minimum mastery criterion (MMC) for Social Studies was set at 80. Students were considered to have met the cognitive mastery level if they scored at least 80 in the final test of each cycle. Qualitative data from observations and interviews were analyzed through data reduction, data display, and conclusion drawing. The qualitative data were used to provide a contextual illustration of student engagement and their responses to the learning model applied.

To ensure the validity of the data, this study utilized source triangulation and method triangulation. Source triangulation was conducted by comparing data from students, teachers, and learning documents. Method triangulation was implemented by employing various data collection techniques, namely observation, tests, questionnaires, and interviews. Through triangulation, the researcher aimed to ensure that the data collected were credible and reflected the actual situation.

Since this study is a classroom action research project, it did not use sophisticated technological instruments but rather relied on instructional tools and simple media. The tools included learning instruments (lesson plans, teaching modules, and student worksheets) designed according to the syntax of the Problem-Based Learning model. The learning media consisted of images, articles, infographics, and short videos that supported the contextual exploration of problems. The main teaching material was a Social Studies module for Grade VII, developed based on the national curriculum content, with adjustments to fit a problem-based approach.

Overall, this study was conducted systematically and in stages, integrating the scientific method with a reflective approach typical of classroom action research. With a combination of quantitative and qualitative data, supported by validated instruments and reliable data collection techniques, it is expected that the findings of this study will provide a comprehensive understanding of the effectiveness of the Problem-Based Learning model in improving students' higher-order thinking skills and learning interest at the junior high school level.

3. RESULTS AND DISCUSSION

RESULT

This study was conducted in three cycles using a classroom action research approach with the Problem-Based Learning model, aimed at improving higher-order thinking skills and students' interest in learning among Class VII.2 students of SMP YLPI Marpoyan Pekanbaru. The results showed a significant improvement in both aspects from cycle to cycle.

Improvement in Students' Higher-Order Thinking Skills

The HOTS test results showed an increase in mastery scores from Cycle I to Cycle III. In Cycle I, student learning mastery only reached 18.92%. Students still struggled to break down problems, perform analysis, evaluate, and create solutions to the issues presented in the learning activities. This indicates that students were not yet familiar with the problem-based learning approach and lacked adequate reflective thinking skills.

In Cycle II, after improvements were made by emphasizing critical thinking modeling and providing guidance in solution development, mastery increased to 56.76%. Students began to show better analytical abilities, identify relationships between economic variables,

and formulate logical solutions. This progress reflects positive changes in students' thinking abilities, supported by integrated discussion and reflection activities within the PBL approach. A significant increase was observed in Cycle III, where learning mastery reached 100%. All students were able to correctly answer HOTS-based questions. They were not only capable of conducting in-depth economic case analysis, but also able to evaluate decisions and devise creative solutions based on data and facts. This result indicates that the PBL approach successfully created a challenging learning environment, empowered students' cognition, and encouraged them to think systematically and reflectively.

Table 1. Percentage of HOTS Mastery per Cycle

Cycle	HOTS Mastery (%)
Cycle I	18.92%
Cycle II	56.76%
Cycle III	100%

In Cycle I, the low HOTS achievement was due to students' unfamiliarity with the PBL method, which demands more complex and independent thinking. Many students were not accustomed to solving real-life problems in a structured manner. However, significant progress occurred in Cycle II after the researcher optimized support and guided students' thinking processes through group discussions. By Cycle III, full mastery was achieved, indicating that students had become familiar with critical and reflective thinking processes, and were capable of solving problems independently.

Improvement in Students' Learning Interest

Students' interest in learning also showed significant improvement. In Cycle I, the average score on the learning interest questionnaire showed that most students had not yet developed strong enthusiasm toward Social Studies learning. They appeared unenthusiastic, passive in discussions, and lacked serious engagement in completing tasks.

After improving the problem triggers, using contextual media, and enhancing the teacher's role as an active facilitator, Cycle II showed increased learning interest. Questionnaire results indicated that over 65% of students began to show enthusiasm, participated actively in group discussions, and demonstrated a desire to complete assignments more diligently. This improvement reflected students' growing awareness of the relevance of the learning material to their daily lives and their motivation to engage in the learning process.

In Cycle III, the increase was even more noticeable. Questionnaire and observation results revealed that all students demonstrated high learning interest. They were enthusiastic throughout all stages of learning, confident in expressing opinions, and exhibited a strong curiosity toward the topics discussed. This improvement indicates that the implementation of PBL successfully created a learning atmosphere that was enjoyable, relevant, and emotionally engaging for students.

Table 2. Percentage of Students' Learning Interest per Cycle

Cycle	HOTS Mastery (%)
Cycle I	40%
Cycle II	68%
Cycle III	100%

In Cycle I, learning interest was categorized as low, caused by previous one-way teaching patterns that failed to stimulate students' curiosity. Social Studies was perceived as rote and non-contextual.

Following the implementation of PBL with real-life problem scenarios, students' interest sharply increased in Cycle II. They began to show enthusiasm, curiosity, and a desire to actively participate in discussions. The most significant increase occurred in Cycle III, where students not only participated actively but also enjoyed the learning process because they felt their ideas and thinking were appreciated.

DISCUSSION

Overall, the implementation of the Problem-Based Learning model in this study was proven effective in enhancing two main aspects: higher-order thinking skills and learning interest. This effectiveness is reflected in quantitative data from improved HOTS test scores and learning interest questionnaires, as well as qualitative data from observations and interviews that showed changes in student attitudes and behaviors in a more positive direction.

The Problem-Based Learning model positioned students at the center of the learning process. They were involved in identifying problems, exploring information, engaging in group discussions, and presenting outcomes. This process not only trained high-level cognitive skills but also developed social skills, including communication, collaboration, and responsibility. In this context, the teacher acted as a facilitator who guided, motivated, and supported students to solve problems independently and creatively.

The findings of this study also confirm and expand upon existing knowledge in the literature on problem-based learning. It can be concluded that the Problem-Based Learning model is effectively applicable to Social Studies learning at the junior high school level and can serve as an alternative learning strategy to overcome the limitations of traditional, teacher-centered methods still widely used in schools. This success could serve as a foundation for developing curricula and instructional strategies that are more contextual, collaborative, and oriented toward 21st-century competencies.

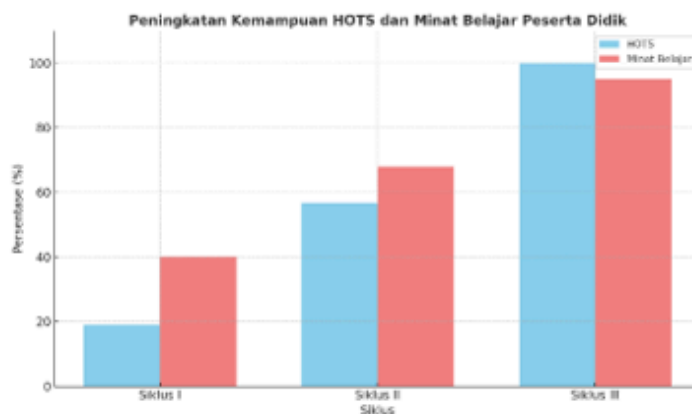


Figure 1. Graph of the Improvement in Higher-Order Thinking Skills and Learning Interest

Based on the figure above, it can be seen that in Cycle I, students' HOTS mastery was still very low (18.92%), and their learning interest was categorized as low (40%). After improvements were made to the learning process, a significant increase occurred in Cycle II, with HOTS mastery rising to 56.76% and learning interest increasing to 68%. The most optimal improvement occurred in Cycle III, where HOTS mastery reached 100% and learning interest rose to 95%.

This improvement indicates that the PBL model effectively shaped a learning process that encouraged students to think critically and logically, while also increasing their interest and motivation to participate in the lessons.

4. CONCLUSION

Based on the findings and discussion, it can be concluded that the Problem-Based Learning (PBL) model has proven to be effective in enhancing students' Higher-Order Thinking Skills (HOTS) and learning interest in Social Studies (IPS) at the junior high school level.

The improvement in higher-order thinking skills was evident through the increase in student mastery percentages—from 18.92% in Cycle I, to 56.76% in Cycle II, and reaching 100% in Cycle III. The problem-based learning process provided opportunities for students to think critically, analytically, and creatively in solving problems relevant to real-life situations. In addition, students' learning interest also increased significantly—from 40% in Cycle I, to 68% in Cycle II, and reaching 95% in Cycle III. Learning activities that emphasized active participation, group discussion, and contextual problem-solving effectively enhanced students' engagement, curiosity, and enthusiasm toward the learning process.

Thus, problem-based learning is effective not only in the cognitive domain but also in the affective aspects of students. The PBL model is worthy of being adopted as an alternative instructional strategy that is contextual, enjoyable, and oriented toward 21st-century skills development. These findings are expected to make a meaningful contribution to the development of instructional practices and serve as a reference for teachers, school principals, and curriculum developers in designing innovative and transformative learning models within schools.

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