

Problem Based Learning Assisted by Sangkar Bumi Props to Improve IPAS Learning Activity and Outcomes for Grade V Elementary School Students

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Abstract

Education is a cornerstone in shaping the future of the younger generation and a conscious effort to optimally develop individual potential. This study aimed to improve fifth-grade students' learning outcomes in Science and Social Studies (IPAS) on Indonesia's geographical location through the implementation of the Problem Based Learning (PBL) model assisted by Sangkar Bumi teaching aids. This Classroom Action Research (CAR) employed the Kemmis and McTaggart spiral model, consisting of planning, acting, observing, and reflecting. The participants were 32 fifth-grade students at SDN Pare 3, Kediri Regency. Data were collected through observation sheets, learning outcome documentation, and multiple-choice tests, then analyzed using descriptive qualitative and quantitative methods. The findings revealed that the PBL model assisted by Sangkar Bumi teaching aids effectively improved both the learning process and student achievement. The average learning outcome score increased from 60.31 in the pre-cycle (15.63% mastery) to 72.97 in Cycle I (50.00% mastery), and further to 83.84 in Cycle II with 100% classical mastery. Student learning activity also improved from 62.28% (Fair) in Cycle I to 87.61% (Very Good) in Cycle II, while teacher implementation increased from 71.43% to 92.86%. These results indicate that the PBL model supported by Sangkar Bumi teaching aids effectively enhances students' engagement and learning outcomes in geographical location topics.

Keywords

Geographical Location, Learning Outcomes, Problem Based Learning, Sangkar Bumi.



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INTRODUCTION

Education is a cornerstone in shaping the future of the younger generation and a conscious effort to optimally develop individual potential. In the current era of the Merdeka Curriculum, optimizing the learning process has become a crucial aspect that requires educators to develop methods capable of enhancing students' active participation and academic achievement (Nasir et al., 2023; Zen, 2025). Learning in elementary school, particularly in fifth grade, is greatly enhanced when conducted using real-world media or

teaching aids, as students are cognitively transitioning from the concrete operational stage to the formal operational stage (Imanulhaq & Ichsan, 2022; Susanto & Wulandari, 2024). Therefore, innovations in learning tools must emphasize the connection between subject matter and real-life contexts to make the learning process more meaningful and improve learning outcomes (Rahman et al., 2020; Suhermi et al., 2025).

At the elementary school level, the Natural and Social Sciences (IPAS) subject plays a strategic role in equipping students to understand natural and social phenomena in an integrated manner (Letemulu et al., 2026). One of the essential topics in fifth-grade IPAS is the geographical location of Indonesia, which focuses on understanding position, orientation, and the interaction between humans and the environment. Learning this material requires a high level of spatial visualization skills. However, IPAS instruction often faces challenges in the form of low student motivation toward social studies topics and a lack of visual aids capable of bridging the gap between abstract concepts and concrete understanding (Agusta et al., 2025; Efendi et al., 2026; Ma'rifah et al., 2025; Rahayu & Sukma, 2026).

The actual conditions at SDN Pare 3 show that most fifth-grade students still struggle to understand the concept of geographic location in a contextual manner. Learning activities are still dominated by a conventional, teacher-centered approach (lectures), without the support of adequate visual media or teaching aids. This causes students to lack focus, tend to be passive, and merely memorize information without truly understanding the material. The impact is evident in low learning outcomes: during the pre-cycle phase, only 15.63% of students met the Minimum Competency Criteria (KKM), with a low class average score of 60.31. This issue highlights the urgent need for innovative learning strategies that actively engage students (Rajaram, 2023; Wardat, 2024).

The Problem-Based Learning (PBL) model is a relevant alternative for addressing this issue because it positions students as active problem-solvers through real-world scenarios (Aziza et al., 2025; Ramadhani et al., 2024). PBL fosters the development of critical thinking skills, collaboration, and independent learning (Husna et al., 2025). To support this model in teaching geographic location, teaching aids are needed as tangible media that help connect abstract concepts with concrete experiences. The "Sangkar Bumi" teaching aid is specifically designed to help students understand Indonesia's geographic position through a three-dimensional visual representation that students can manipulate directly.

Several previous studies have demonstrated the effectiveness of PBL in improving social studies learning outcomes in elementary schools (Assa et al., 2024; Lisnawati et al., 2022; Sari & Rosidah, 2023). However, the integration of the PBL model with concrete spatial media such as the "Sangkar Bumi" model in thematic social studies curriculum at the elementary school level still requires further testing to assess its impact on overall learning activities and outcomes. The use of concrete media not only supports conceptual understanding but also strengthens the quality of interactions during the collaborative inquiry process.

Based on the issues outlined above, this study focuses on improving the quality of students' learning processes and outcomes through the application of the Problem-Based

Learning (PBL) model, supported by the “Sangkar Bumi” teaching aid, in the context of Indonesia’s geographic location. The primary focus of this study is to describe the implementation of this model and to measure improvements in social studies learning outcomes among fifth-grade students at SDN Pare 3 so that they meet the criteria for mastery and effectiveness at the class level.

METHODS

The type of research used in this study is Classroom Action Research (PTK) or Classroom Action Research. The Classroom Action Research approach was chosen to improve the quality of the learning process and outcomes through systematically planned actions within the classroom setting. The CAR model applied was the Kemmis and McTaggart spiral model, which consists of four main stages in each cycle: planning, acting, observing, and reflecting (Siregar, 2025). This study was conducted at SDN Pare 3, Pare Subdistrict, Kediri Regency, during the even semester of the 2025/2026 academic year. The research subjects were 32 fifth-grade students, consisting of 14 boys and 18 girls.

The research procedures were carried out over two cycles to achieve the predetermined success indicators. The intervention involved the application of the Problem-Based Learning (PBL) model integrated with the use of the “Sangkar Bumi” teaching aid. This teaching aid serves as a concrete visual medium to help students understand the abstract concept of Indonesia’s geographic location. In Cycle I, instruction focused on problem identification and the use of the medium in group settings. The results of the Cycle I reflection were then used to revise the plan for Cycle II, including restructuring group roles, increasing the time allocated for inquiry, and refining features of the “Sangkar Bumi” teaching aid.

The data collection techniques in this study utilized three main instruments: observation, tests, and documentation. Observations were conducted using a student activity observation sheet covering seven indicators, such as engagement, group collaboration, and the use of teaching aids. The test instrument consisted of 20 multiple-choice questions administered as a post-test at the end of each cycle to measure students’ cognitive competencies. Documentation was used to collect authentic evidence in the form of activity photos, Lesson Plans (RPP), and student work samples.

Data analysis was conducted continuously using both qualitative and quantitative descriptive methods. Qualitative data analysis followed the Miles and Huberman model, which consists of data reduction, data presentation, and drawing conclusions to describe student activities and teacher performance (Miles et al., 2014). Meanwhile, quantitative data analysis was used to calculate the class average score (Petscher et al., 2013) rate using the formula:

$$P = \frac{\text{Number of successful students}}{\text{Total students}} \times 100\% \qquad \bar{X} = \frac{\sum X}{N}$$

Quantitative data analysis was used to calculate the class-wide mastery rate using the formula:

The success indicators for the intervention were defined as follows: at least 85% of students must achieve the Minimum Passing Score (KKM) of 72; teacher implementation of instruction must reach at least 85%; and student learning activities must fall into the “active” category ($\geq 80\%$).

FINDINGS AND DISCUSSION

Findings

The implementation of the Problem Based Learning (PBL) model assisted by Sangkar Bumi teaching aids was carried out through two classroom action cycles. The learning process showed continuous improvement in teacher implementation, student participation, and learning achievement. The overall results are summarized in **Table 1**.

Table 1. Summary of Research Findings

Indicator	Pre-cycle	Cycle I	Cycle II
Average Score	60.31	72.97	83.84
Classical Mastery	15.63%	50.00%	100.00%
Student Activity	-	62.28%	87.61%
Teacher Implementation	-	71.43%	92.86%

Source: Research Data (2026)

The findings indicate a consistent improvement across all measured indicators. The average learning score increased by 23.53 points, from 60.31 in the pre-cycle to 83.84 in Cycle II. Classical learning mastery improved dramatically from 15.63% to 100%, indicating that all students achieved the minimum mastery criterion after the second cycle. Student learning activity also increased from 62.28% (Fair) to 87.61% (Very Good), while teacher implementation improved from 71.43% to 92.86%, reflecting better classroom management and more effective implementation of the PBL stages. These findings demonstrate that integrating PBL with Sangkar Bumi teaching aids positively influenced both the learning process and student achievement.

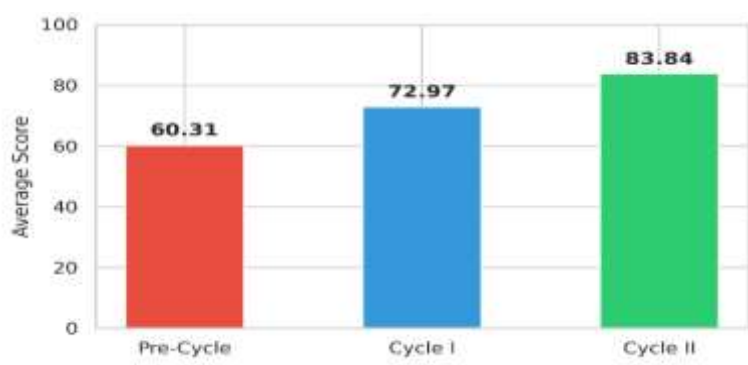


Figure 1. Improvement of Average Learning Scores (Pre-cycle, Cycle I, Cycle II)

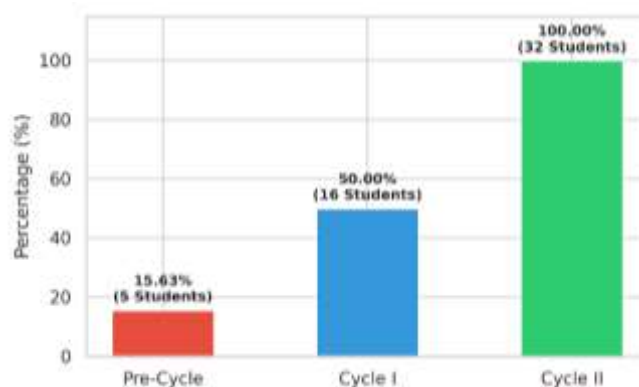


Figure 2. Improvement of Classical Mastery

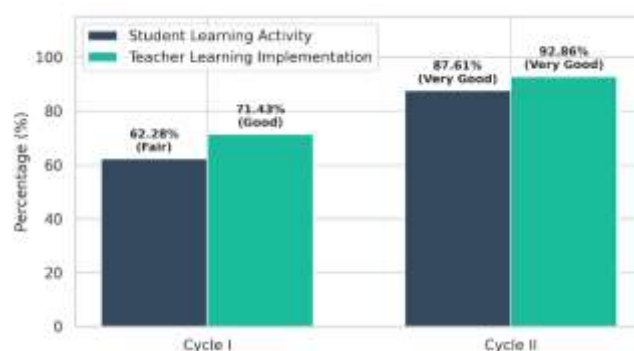


Figure 3. Improvement of Student Activity and Teacher Implementation

Discussion

The findings demonstrate that the implementation of the Problem Based Learning (PBL) model assisted by Sangkar Bumi teaching aids effectively improved both students' learning outcomes and the overall quality of classroom learning on the topic of Indonesia's geographical location. The improvement was not limited to students' academic achievement but was also reflected in the progressive enhancement of learning implementation throughout the two action cycles. In the first cycle, students were still adapting to collaborative learning and inquiry-based activities. Classroom observations revealed that several groups required intensive teacher guidance, time management was not yet optimal, and not all students actively participated in discussions. Consequently, although the average score increased compared with the pre-cycle, classical mastery had not yet reached the expected target. Reflection on these limitations became the basis for improving instructional strategies in Cycle II, including clearer task distribution, more structured group facilitation, and more effective utilization of the Sangkar Bumi teaching aids. These improvements resulted in a more systematic learning process, increased student participation, and ultimately achieved 100% classical mastery. This pattern indicates that the effectiveness of PBL is strengthened when continuous reflection and refinement are incorporated into the learning process, as emphasized in classroom action research.

The substantial increase in learning outcomes from the pre-cycle to Cycle II also

suggests that students benefited from learning experiences that encouraged problem solving, collaboration, and active knowledge construction rather than passive information reception. During the learning process, students were required to analyze geographical problems, discuss possible explanations within their groups, manipulate the Sangkar Bumi teaching aids to identify Indonesia's geographical position, and present their findings to the class. Such activities encouraged learners to actively construct concepts through interaction with peers and learning resources, making geographical concepts more meaningful and easier to understand. This finding supports previous studies reporting that PBL improves learning outcomes by promoting critical thinking, collaborative learning, and meaningful learning experiences (Assa et al., 2024; Lisnawati et al., 2022; Sari & Rosidah, 2023). Furthermore, Husna et al. (2025) and Aziza et al. (2025) argued that problem-based learning encourages students to develop higher-order thinking skills because they are directly involved in investigating authentic problems and generating solutions collaboratively.

Another important finding is the considerable improvement in students' learning activity, which increased from 62.28% in Cycle I to 87.61% in Cycle II. This increase demonstrates that students became progressively more engaged throughout the learning process. Observation results indicated that students showed greater willingness to ask questions, participate in discussions, collaborate with group members, utilize the Sangkar Bumi teaching aids, and present their ideas confidently. Increased participation suggests that the learning environment shifted from teacher-centered instruction toward student-centered learning, where students assumed greater responsibility for constructing their own understanding. Such findings are consistent with Wardat (2024), who emphasized that innovative instructional approaches promote learner engagement, critical thinking, and lifelong learning competencies. Similarly, Rajaram (2023) explained that future-oriented learning strategies require students to become active participants who collaboratively solve contextual problems rather than merely receive information from teachers.

The effectiveness of Sangkar Bumi teaching aids also contributed substantially to students' conceptual understanding. The topic of Indonesia's geographical location requires learners to comprehend spatial relationships that are often difficult to visualize through textbooks alone. By using concrete three-dimensional teaching aids, students were able to directly observe Indonesia's position relative to continents and oceans while discussing the geographical implications in collaborative groups. This concrete learning experience reduced the abstractness of geographical concepts and enabled students to establish stronger conceptual connections. The findings support Piaget's cognitive development theory, which states that elementary school students in the concrete operational stage understand concepts more effectively through direct manipulation of concrete objects (Imanulhaq & Ichsan, 2022; Susanto & Wulandari, 2024). Therefore, integrating PBL with Sangkar Bumi teaching aids successfully accommodated the cognitive characteristics of fifth-grade students by connecting abstract geographical concepts with observable learning experiences.

The findings further indicate that combining PBL with Sangkar Bumi teaching aids

created contextual learning experiences that linked classroom content to real-world situations. Rather than memorizing geographical facts, students explored why Indonesia's geographical location influences its climate, economy, and cultural diversity through collaborative investigation. This contextualization made learning more meaningful because students understood not only factual knowledge but also its practical implications. These findings are consistent with contextual learning theory, which emphasizes that knowledge becomes more meaningful when connected to learners' real-life experiences (Rahman et al., 2020; Suhermi et al., 2025). Similar evidence has also been reported by Efendi et al. (2026), Ma'rifah et al. (2025), and Rahayu & Sukma (2026), who found that visual and concrete learning media significantly improve students' understanding of Social Studies and IPAS concepts by facilitating conceptual visualization. Another noteworthy result is the improvement in teacher implementation, which increased from 71.43% in Cycle I to 92.86% in Cycle II. This finding indicates that the success of instructional innovation depends not only on students' responses but also on teachers' ability to manage learning effectively. Through the reflection process after Cycle I, the teacher refined classroom management strategies, improved facilitation during group discussions, optimized the use of learning media, and allocated learning time more efficiently. These adjustments contributed directly to better student engagement and improved learning outcomes. This finding aligns with Nasir et al. (2023), who emphasized that continuous school and instructional improvement is fundamental to enhancing educational quality. Likewise, Zen (2025) highlighted that effective classroom management enables teachers to create learning environments that maximize student participation and learning effectiveness.

Overall, the present study extends previous research by demonstrating that the effectiveness of PBL is substantially enhanced when combined with instructional media specifically designed to match students' developmental characteristics and the nature of the learning content. While previous studies have generally examined the effects of PBL or visual learning media separately, this research provides empirical evidence that integrating both approaches simultaneously improves instructional implementation, student engagement, and learning outcomes. These findings suggest that successful instructional innovation in elementary education requires not only the selection of an appropriate pedagogical model but also the integration of concrete learning media capable of transforming abstract concepts into meaningful and contextual learning experiences.

CONCLUSION

This study aimed to examine the effectiveness of implementing the Problem Based Learning (PBL) model assisted by Sangkar Bumi teaching aids in improving the learning outcomes of fifth-grade elementary school students on the topic of Indonesia's geographical location. The findings demonstrate that integrating PBL with concrete learning media successfully enhanced both the learning process and students' academic achievement. Beyond improving learning outcomes, the intervention also promoted greater student participation

and strengthened teacher performance in managing student-centered learning activities. These results indicate that combining inquiry-based learning with context-specific teaching aids provides a meaningful learning environment that supports conceptual understanding of geographical topics among elementary school students.

The main contribution of this study lies in demonstrating that the effectiveness of PBL can be strengthened through the use of a concrete instructional medium specifically designed for geographical learning. This integration extends previous research by showing that instructional innovation should not rely solely on learning models but also consider learning media that align with students' cognitive development and learning characteristics.

Despite these contributions, this research was conducted in a single classroom using a classroom action research design, limiting the generalizability of the findings. Future studies are recommended to involve larger samples across different schools and regions, employ experimental or quasi-experimental designs to compare instructional approaches, and investigate the long-term effects of integrating PBL with innovative teaching media on students' critical thinking, problem-solving skills, and learning retention. Further research may also explore the integration of digital or technology-based instructional media with PBL to support learning in broader educational contexts.

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