

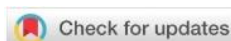
# Improving Student Learning Outcomes Using the Problem Based Learning (PBL) Model Assisted by QR Code Card Media in the Ipas Subject for Grade V Students at Elementary School

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## Abstract

This study aims to enhance students' cognitive learning outcomes using the Problem-Based Learning model assisted by QR Code Card media. The research method employed by the researchers is Classroom Action Research (CAR) with four main stages: (1) planning, (2) action, (3) observation, and (4) reflection. The research was conducted in grade V of SDN 37 Bengkulu City with 25 student participants. Data collection techniques included observation and tests. The improvement in cognitive learning outcomes of grade V students at SDN 37 Bengkulu City is evident from the pre-cycle results, where only 10 out of 25 students (40%) achieved mastery. In cycle I, the student's learning outcomes increased to 72% mastery; by cycle II, 92% of students achieved mastery. This research met the success indicator set by the researchers, which was 80%, with the final result in cycle II being 92%. From this research, it can be concluded that applying the Problem-Based Learning model assisted by QR Code Card media can improve the cognitive learning outcomes of grade V students at SDN 37 Bengkulu City.

## A. Introduction

Education is a crucial aspect for humanity to gain knowledge and character formation for the advancement of civilization. It is a conscious and planned effort to develop the abilities within individuals to lead a life in accordance with the progress of the times. Education is a deliberate endeavor to transmit culture from one generation to the next. It makes the current generation a role model by inheriting the teachings of previous generations (Firmansyah, 2019). Education encompasses lifelong learning experiences in all places and situations that positively influence the growth of every individual (Ujud et al, 2023). Education is carried out through a learning process conducted by humans. It becomes essential for shaping one's future because it helps individuals discover their potential (Rahmi et al, 2019).

Learning is a process of interaction involving two-way communication between teachers and students in an educational environment that aims to build skills, knowledge, and shape students' attitudes. It is the interaction between students, educators, and learning resources within a learning environment (Putri et al, 2022). Learning is a conscious effort in teaching activities where educators guide students to change their behavior, thereby enabling them to acquire new skills and knowledge (Hasanah et al, 2021). Teachers, as educators, play a critical role in education. Beyond delivering information, they serve as instructors, mentors, and trainers, equipping students with knowledge, skills, and moral values. In the Merdeka

curriculum, teachers are also expected to act as facilitators, guiding and meeting students' needs during the learning process.

Natural and Social Sciences is one of the subjects in Indonesia's primary education curriculum. The subject not only provides information related to the natural and social environment but also encourages students to think critically and develop character. Character formation is one of the most important outcomes in a curriculum and can be incorporated into subjects such as Natural and Social Sciences (Ramadhan & Santosa, 2023). The goal of the Natural and Social Sciences subject in Indonesia is to instill in students a sense of faith in the greatness of Almighty God and the order of His creations (Lovita et al, 2024). Therefore, teachers must be able to teach Natural and Social Sciences effectively. They should create active learning activities that focus not just on the teacher but on the students, ensuring that students gain a deep understanding. To achieve this, teachers need to innovate and create engaging, student-centered learning activities, using teaching media and models that foster active, student-focused learning.

A learning model is a framework that teachers can use to organize lessons to achieve learning objectives. It provides a systematic structure for teaching. One of the learning models teachers can use is the Problem Based Learning (PBL) model. PBL is an approach that uses real-world problems as a context in which students learn specific content by applying critical thinking and problem-solving skills to acquire essential knowledge and concepts (Sianipar et al, 2023). The PBL model focuses on problem-solving in everyday life. In this model, students are faced with real problems and must use their knowledge and understanding to resolve them. PBL provides an active learning environment for students (Jihanifa et al, 2023). It helps students think critically, using their knowledge and skills. In PBL, students are grouped and work together to solve problems, making the learning process student-centered. However, the implementation of PBL can be less effective if it is not supported by appropriate teaching media. Teaching media are important in attracting students' interest during the learning process. The Problem Based Learning (PBL) approach offers a number of benefits, such as: educating pupils in critical, analytical, creative, and holistic thinking. Improving the relevance of teaching in schools to real-world situations. Raising pupils' interest in and desire for learning. Assisting pupils in applying their knowledge to comprehend difficulties in the actual world. Helping pupils acquire new information and assume accountability for their education. Assisting pupils in refining their investigative and analytical abilities. Encouraging kids to develop as independent thinkers and thinkers.

Learning Media are tools that can be used to facilitate the learning process, making it more effective and optimal (Fadilah et al, 2023). Learning media refers to anything used by an educator to deliver information during the learning process, ensuring that the learning experience is effective. The role of media in the teaching and learning process is a key component of instruction. The use of media should be an integral part of learning activities that require careful attention, as learning media allows participants to interact actively by utilizing their full potential (Sianipar et al, 2023). Learning media can assist teachers in creating engaging and effective lessons, making students more interested in learning activities. As educators, teachers must innovate in developing learning media that can enhance students' interest in learning, ensuring that educational objectives are achieved.

Schools, as educational institutions, must be equipped with adequate facilities and infrastructure to support learning activities for both teachers and students. Teachers must also be able to create and select learning media that suit students' needs, as learning media is one of the essential elements in the learning process. Innovative and engaging learning media can help achieve learning goals effectively. Based on observations conducted by the researchers at SDN 37 Bengkulu City, it was found that students' learning outcomes in the Natural and Social Sciences subject were still low, as seen from the pre-cycle learning results during the guided cycle. Many students had low learning outcomes and had not yet met the Learning Objective Completion Criteria, which was set at 70. One of the contributing factors was that teachers were still using conventional teaching methods and simple media, such as printed pictures. The use of conventional methods and simple media failed to motivate students, resulting in passive participation during lessons, which in turn affected their learning outcomes. Therefore, teachers must be able to develop engaging learning media and choose teaching models that meet students' needs.

One of the teaching models that can be used by teachers to create student-centered learning is the Problem Based Learning (PBL) model. PBL emphasizes critical thinking to solve real-world problems. This model encourages students to be active participants in learning, which can improve their learning outcomes, especially in the IPAS subject. The use of the PBL model in teaching the Natural and Social Sciences subject can be enhanced by incorporating appropriate learning media, such as technology-based media like QR Code cards. A QR Code (Quick Response Code) is a two-dimensional barcode introduced in 1994 by the

Japanese company Denso Wave. The advantage of QR Codes is that information can be stored both horizontally and vertically. QR Codes function as links that can store addresses, URLs, phone numbers, text, and SMS, and are used in magazines, advertisements, business cards, and other media (MKM et al, 2023). QR Codes are two-dimensional matrix images or symbols capable of storing data, such as text, URLs, and other information, aimed at quickly conveying information. With QR Codes, students can receive information swiftly. A QR Code card contains a scannable QR Code that links to images related to the lesson material. Using the PBL model, supported by QR Code card media, can capture students' interest in the learning process, making them more active participants and, consequently, improving their learning outcomes.

Based on this background, the researcher has conducted a classroom action research titled: "Improving Student Learning Outcomes Using the Problem Based Learning (PBL) Model Assisted by QR Code Card Media in the Natural and Social Sciences Subject for Grade V Students at SD Negeri 37 Bengkulu City."

## B. Research Methods

This research was conducted in Grade V, first semester, during the 2024 academic year at SD Negeri 37 Bengkulu City, focusing on the Natural and Social Sciences subject. The subjects of this study were 25 Grade V students from SD Negeri 37 Bengkulu City. The improvement procedure was designed to be implemented in two cycles. The research model chosen for this study is a classroom action research model, structured into four components: planning, action implementation, observation, and reflection.

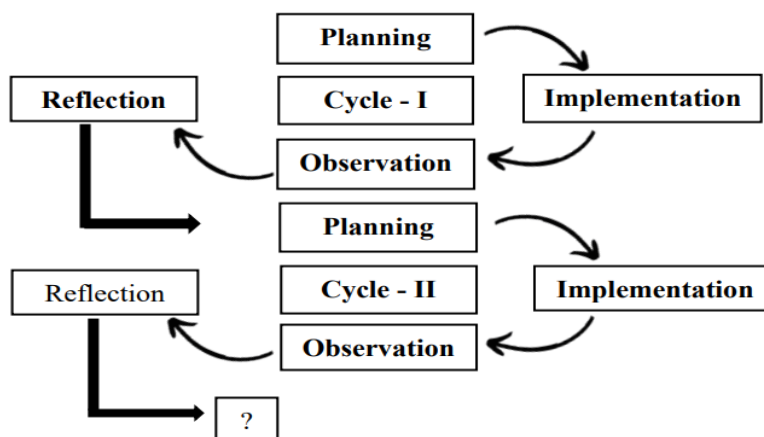


Figure 1. Research Cycle

The data collection techniques include observation, documentation, and tests. The observation technique involves data collection by using the senses to observe, with the results recorded to monitor and note significant events. The documentation technique is a method of searching for and collecting data in the form of writings, images, and historical artifacts. Quantitative data analysis on learning outcomes is conducted using the percentage formula from the Ministry of Education (Mutmainnah & Ningsih, 2023), as follows:

$$\text{Final Score} = \frac{\text{Score Obtained}}{\text{Total Score}} \times 100$$

The formula used to calculate the average learning outcomes of students is stated by Aqib (Gultom, 2023).

$$\bar{X} = \frac{\sum X}{n}$$

Information:

$\bar{X}$  = Average value

$\sum X$  = Total value of all students

$\sum N$  = Total number of students

Student learning completeness percentage can be calculated using the following formula (Harnedi, 2022):

$$\text{Average Score} = \frac{\sum \text{Student who completed the learning}}{\sum \text{All Students}} \times 100\%$$

In this study, the focus of the research is the evaluation results at the end of the cycle. With the success indicator if in cycle I the learning achievement of students reaches 80% of all students.

### C. Results and Discussion

The classroom action research using the Problem Based Learning model assisted by QR code cards had an overall positive impact on improving the cognitive learning outcomes of Grade V students at SDN 37 Bengkulu City. This improvement is evident from the data collected during the pre-cycle, Cycle I, and Cycle II phases. After conducting actions across two cycles, the research target, which includes both process and outcome goals, was achieved.

#### *Pre-Cycle*

During the pre-cycle, the researcher implemented conventional teaching methods to assess the initial conditions of the research subjects. This phase took place on July 16, 2024, with an allocated time of  $2 \times 35$  minutes. The pre-cycle was conducted to identify the baseline condition of the research subjects. The researcher employed conventional teaching methods using textbooks as the primary instructional material. The results of the pre-cycle can be seen in the table below:

**Table 1.** Pre-Cycle Learning Outcomes

No.	Score	Frequency	Total Score	Percentage	Remarks
1.	>70	10	860	40%	Pass
2.	<70	15	670	60 %.	Fail
<b>Total</b>		25	1.530	100%.	
<b>Average</b>			<b>61, 20</b>		

Based on the data, it can be seen that the percentage of students who scored above the Minimum Competency Criteria or passed was 40%, while the percentage of students who did not meet the KKM or failed was 60%. From this pre-cycle activity, it was evident that the students' learning outcomes were still low due to a lack of motivation in engaging with the learning process.

#### *Cycle I*

During the implementation of Cycle I, the researcher conducted lessons using the Problem Based Learning model assisted by QR code cards. Before executing this, the researcher first discussed the Problem Based Learning model with QR code cards with the teacher. Cycle I was conducted on August 6, 2023, with an allocated time of  $2 \times 35$  minutes. When the researcher introduced the Problem Based Learning model assisted by QR code cards, the students were very enthusiastic about following the explanation, as they had never used this model before. The results of Cycle I can be seen in the table below:

**Table 2.** Cycle I Learning Outcomes

No.	Score	Frequency	Total Score	Percentage	Remarks
1.	>70	18	1580	72%	Pass
2.	<70	7	400	28%.	Fail
<b>Total</b>		25	1.980	100%.	
<b>Average</b>			<b>79,20</b>		

Based on Table 2 above, the results obtained in Cycle I show that 18 out of 25 students scored above the Minimum Competency Criteria for Learning Objectives (KKTP), with a success rate of 72%, while 7 students scored below the KKTP, representing 28%. The total score of students' learning outcomes in Cycle I was 1.980, with an average score of 79, 20.

#### *Cycle II*

During the implementation of Cycle II, the researcher followed the same learning steps as in Cycle I, using the Problem Based Learning model assisted by QR code cards. The planning for Cycle II was based on the reflections from Cycle I, allowing for improvements to address the shortcomings from the first cycle. Cycle II was conducted on August 19, 2024. The table below shows the results obtained in Cycle II:

**Table 3.** Cycle II Learning Outcomes

No.	Score	Frequency	Total Score	Percentage	Remarks
1.	>70	23	2.120	92%	Pass

No.	Score	Frequency	Total Score	Percentage	Remarks
2.	<70	2	120	8%.	Fail
<b>Total</b>		25	2.240	100%.	
<b>Average</b>			<b>89,60</b>		

Based on the table, it can be seen that the percentage of students who scored above the Minimum Competency Criteria for Learning Objectives (KKTP) or passed is 92%, with 23 students achieving this. Meanwhile, the percentage of students who did not pass or did not meet the KKTP is 8%, with 2 students in this category. Therefore, the success rate in Cycle II is 92%. This indicates that the learning implementation in this cycle using the Problem Based Learning model assisted by QR code cards was successful.

This research is guided by journals (Dulyapit, et al, 2023) Application of the Problem Based Learning (PBL) Model to Improve Student Learning Outcomes in Class V at UPTD SD Negeri Tapos 5, Depok City, this title focuses more broadly on the application of the PBL model itself to enhance learning outcomes in fifth grade, without specifying the use of any additional media or subjects. The focus is on the general implementation of the PBL approach at a school in Depok City. Whereas Improving Student Learning Outcomes Using the Problem Based Learning (PBL) Model Assisted by QR Code Card Media in the IPAS Subject for Grade V Students at SD Negeri 37 Bengkulu City, This title emphasizes the use of QR Code Card Media as an assistive tool for implementing the PBL model in improving student learning outcomes specifically in the Science subject for fifth-grade students at a school in Bengkulu City. It highlights the integration of digital technology (QR codes) into the learning process. Key Differences: 1) Media Integration: the first title includes QR Code Card Media, while the second does not specify additional tools. 2) Subject Specificity: The first title is specific to the IPAS subject, whereas the second is general across subjects. 3) Context: Both address the implementation of the PBL model, but in different regions and with varying scopes of focus.

#### D. Conclusion

Based on the research results, it can be concluded that the Problem Based Learning (PBL) model can improve the cognitive learning outcomes of students. The improvement in cognitive learning outcomes of fifth-grade students at SD Negeri 37 Bengkulu City is evident from the pre-cycle activity, where only 10 out of 25 students passed, with a success rate of 40%. In Cycle I, the average achievement of students' learning outcomes increased, with a success rate of 72%. This further improved to 92% in Cycle II. The study has met the success criteria set by the researcher, which was 80%, with the final success rate in Cycle II reaching 92%. Therefore, the research process using the Problem Based Learning model supported by QR code media was successful and proceeded well according to plan.

Based on the conclusion, several recommendations can be made for teachers: a) To enhance student engagement, creativity, and learning effectiveness, it is recommended to implement the PBL model. b) To obtain accurate responses that align with the study's objectives, it is suggested to encourage students to express their opinions and reflections through questions that are more focused on the learning process using appropriate teaching methods.

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