APPLICATION OF THE PROBLEM-SOLVING *LEARNING MODEL* TO IMPROVE LEARNING OUTCOMES IN IPAS LEARNING IN GRADE IV STUDENTS SD N MATARAM

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Abstract: This research aims to improve student learning outcomes in science subjects through the application of the Problem-Solving learning model in grade IV of SDN Mataram. The main problem in this study is explicitly formulated as: *"Can the application of the Problem-Solving learning model significantly improve the learning outcomes of science students in grade IV of SDN Mataram?"*. The method used is a pseudo-experiment with One Group Pre-test and Post-test Design. The research sample was 20 students in grade IV. The data collection instrument is in the form of a multiple-choice objective test. The results of data analysis showed a significant increase between the average score of pre-tests (50.40) and post-test (85.40), with the level of learning completeness increasing from 0% to 90%. This confirms that the Problem-Solving learning model is effective in enhancing students' science learning outcomes in primary education settings. This research has practical implications for teachers in choosing active learning models that increase student participation and academic implications in enriching empirical references related to the effectiveness of the Problem-Solving model in primary education. Further research is recommended to apply this model to other subjects and with larger populations.

Keywords: Problem Solving, Learning Outcomes, IPAS, Active Learning

INTRODUCTION

Education is a key component in the development of the quality of human resources during this globalization era. Learning at the elementary school level is the core basis in shaping morals, skills, and critical thinking patterns from children from an early age. One of the subjects that has a strategic role in developing children's logical and scientific thinking skills is Natural and Social Sciences (IPAS). Through IPAS, students are given directions to understand several natural and social phenomena that occur in the surrounding environment and are able to

develop problem-solving skills in daily life.

However, in the reality of learning classes in elementary schools, including Mataram Elementary School, several obstacles were found in learning IPAS. From the initial results of observations and interviews with grade IV teachers, it was found that student learning outcomes were still relatively low. This is strengthened

by the low number of students who have not reached the Minimum Completeness Criteria (KKM) that have been set by the school. The low learning value is driven by several factors, including a lack of student motivation to learn, high active participation in the learning process, and the use of learning methods that are still conventional and teacher-centered.

This condition shows that there is an urgent need to implement a more innovative, active, and oriented learning model to develop students' thinking skills. One of the learning models that is relevant to this problem is the Problem-Solving learning model. This model is a student-centered learning approach, where students are encouraged to identify problems, analyze situations, design solutions, and evaluate the results of solving these problems.

The Problem-Solving learning model also has advantages in improving students' critical thinking skills, creativity, and higher order thinking skills (HOTS). By giving students the opportunity to be directly involved in the problem-solving process, it is hoped that students can build their own knowledge in a more in-depth and contextual way.

In addition, the Problem-Solving model is also in accordance with the learning paradigm in the Independent Curriculum which supports project-based learning and an emphasis on scientific thinking processes. This learning using this model is also very suitable for the type of cognitive development of elementary school students who are at a concrete operational level according to Piaget's theory, i.e. students still need real and contextual learning experiences to understand new concepts.

According to the above background, then the research centered on implementing Problem Solving learning model as an attempt to enhance learning achievement of IPAS students of grade IV of SDN Mataram. So this research question was can the application of the Problem-Solving learning model significantly improve outcomes of students in grade IV of SDN Mataram? This study then aims to find out how effective the application of the Problem-Solving learning model is in improving the learning outcomes of social studies of grade IV students of SDN Mataram.

RESEARCH METHODOLOGY

Types and Approaches to Research

This study uses the Quantitative by the eksperimen semu (quasi- experimental research). This type of research was chosen because the researcher could not randomly randomize classes, but instead used existing classes as research subjects. The research design used is One Group Pretest-Posttest Design, where the research subjects were given a pre-test to measure initial ability, then given a treatment in the form of learning with the Problem-Solving model, and ended with a final test (post-test) to measure the improvement of learning outcomes.

The population in this study is all grade IV students of SDN Mataram which totals 20 students. Sampling technique using **sampling jenuh**, where the entire population is used as a research sample due to the relatively small number of students and easy access for researchers.

The main instruments in this study are **Learning Outcome Test** shaped **Multiple Choice** with a total of 13 questions. The questions have gone through a validation process by subject matter experts and have been tested on students outside the research sample to ensure the level of validity, reliability, differentiation, and difficulty of the questions.

Data collection techniques include:

1. **Written Test (Pre-test and Post-test):**
   The pre-test is conducted before learning with the Problem Solving model, while the post-test is carried out after the learning is completed.
2. **Observation:**
   Used to observe the learning process and student activities during the learning process.
3. **Documentation:**
   Used to collect additional data such as attendance lists, photos of learning activities, and student grade records.

Data Analysis Techniques

Data analysis was carried out in two stages, namely:

1. **Descriptive Statistics:**
   Used to calculate grade point average, standard deviation, highest grade, lowest grade, and percentage of learning completion.
2. **Inferential Statistics:**
   Hypothesis testing was performed with **a normality test (Chi-squared)** to ensure normal data distribution, as well as **hypothesis testing using a single-sided Z-test**, to determine if there was a significant improvement in learning outcomes after treatment.

The analysis steps include:

a. Calculate the average of pre-test and post-test results.
b. Calculates standard deviations and standard errors.
c. Calculating the value of Zcalcul.
d. Comparing the value of Zcal with Ztabel at a significance level of 5% ($\alpha = 0.05$).

RESEARCH RESULTS

Research This aims to determine the effectiveness of the application of the Problem-Solving learning model in improving the learning outcomes of social studies of grade IV students at SDN Mataram. The data collection process is carried out through the provision of pre-tests before treatment and post-tests after treatment. In addition, observations of student activity and participation during learning were also carried out to strengthen the research findings.

Pre-Test and Post-Test Results

1 . Pre-Test Results

The pre-test was given to 20 grade IV students before learning with the Problem-Solving model. The goal is to measure the student's initial level of knowledge related to IPAS material.

Yes	Aspects Assessed	Value
1	Highest Score	69
2	Lowest Score	31
3	Grade Point Average	50,40
4	Standard Deviation	13,57
5	Number of Students Completed (≥70)	0 students (0%)
6	The number of students has not yet been completed	20 students (100%)

Interpretation:

From the data, it can be seen that not a single student has reached KKM (70). This shows that students' understanding of the IPAS material is still low before treatment.

2. Post-Test Results

After students participated in learning with the Problem-Solving model during two core meetings, a post-test was carried out to find out the extent of the improvement in student learning outcomes.

Yes	Aspects Assessed	Value
1	Highest Score	100
2	Lowest Score	62
3	Grade Point Average	85,40
4	Standard Deviation	10,43
5	Number of Students Completed (≥70)	18 students (90%)
6	The number of students has not yet been completed	2 students (10%)

Interpretation:

There was a significant increase in the average student score, from 50.40 to 85.40, with the number of students who completed increased from 0% to 90% of students.

Discussion

The results of the study show that the Problem-Solving learning model is effective in improving the learning outcomes of grade IV students in science subjects. This can be seen from:

1. Improvement in Grade Average: There was a significant increase in the average student grade, indicating that students were able to understand the material better after being given learning with this model.

2. Increased Completion Percentage: Before treatment, no students achieved KKM, while after treatment, 90% of students managed to achieve scores above KKM, demonstrating the effectiveness of the interventions carried out.

3. Changes in Student Learning Behavior: Based on the results of observations during learning, students appear to be more active in discussing, more courageous in expressing opinions, and more involved in the process of identifying problems and finding solutions.

4. Strengthening Critical and Creative Thinking Skills: Through the stages in the Problem-Solving model, students learn to analyze problems, design solutions, and evaluate the results. This process directly improves students' critical thinking skills and problem-solving skills.

5. Conformity with Constructivist Learning Theory: These results are in line with Piaget and Vygotsky's constructivist theories which state that effective learning is learning that places students as active subjects who build their own knowledge through hands-on learning experiences.

6. Relevance to the Independent Curriculum: The Problem-Solving learning model also strongly supports the implementation of the Independent Curriculum which encourages project-based learning, is oriented to real problems in the surrounding environment, and requires students to think critically and collaboratively.

CONCLUSION

Based on the analysis, processing, and discussion of the data that has been carried out, it can be concluded that the application of the Problem-Solving learning model can significantly improve student learning outcomes in science subjects in grade IV students of SDN Mataram. This increase is very clearly reflected in the change in students' average scores which increased significantly from 50.40 in the pre-test to 85.40 in the post-test, with an increase in learning completeness from 0% to 90% of students who reached the Minimum Completeness Criteria (KKM).

The Problem-Solving learning model is able to create an active, communicative, and participatory learning atmosphere. Students become more involved in the learning process, starting from identifying problems, designing solutions, conducting analysis, to drawing conclusions about the given problems. This learning process directly trains critical thinking, analytical, and encourages students to become active learners.

This increase also supports the theory of constructivism which emphasizes that learning will have more meaning when students actively play a role in building their own knowledge through concrete and applicative learning experiences in the context of their lives. Thus, the use of the Problem-Solving model not only has a positive impact on students' cognitive achievements, but also on students' scientific attitudes, learning independence, and social skills.

Practically, this study presents empirical evidence that the implementation of the Problem Solving model is very effective in improving the quality of the IPAS learning process and outcomes. Teachers can apply this model as an alternative in designing more fun and meaningful learning. Meanwhile, academically, this study adds references in the development of active learning strategies based on problem solving at the primary education level.

Implications, Recommendations, and Directions for Advanced Research

Based on the results of the research and the limitations encountered during the implementation, some recommendations for further research are as follows:

1. **Sample Expansion and Research Location**: This study was only conducted in one class at SDN Mataram with a limited number of samples. Further research is suggested involving more schools and larger populations, both in terms of the number of students and the diversity of school backgrounds, to improve the generalization of outcomes.

2. **Application of Problem Solving Models to Other Materials**: The Problem Solving Model has great potential to be applied to other IPAS materials such as the life cycle of living things, environmental changes, or energy concepts. Further research can focus on the influence of this model on different IPAS materials.

3. **Measuring Impact on the Affective and Psychomotor Domains** This study only measures the cognitive domain (learning outcomes). It is suggested that further research develop instruments to measure the influence of the Problem Solving model on affective (learning attitudes, interests) and psychomotor (students' practical skills) aspects.

4. **Integration with Educational Technology**: The Problem Solving model can be combined with the use of technology-based media such as interactive videos, IPAS simulation applications, or e-learning platforms. Subsequent research can examine the effectiveness of this integration on student motivation and learning outcomes.

5. **Long-Term Research (Longitudinal Study):** This study was conducted in a relatively short time. It is recommended to conduct longitudinal research to determine the long-term impact of the application of the Problem Solving model on the development of critical thinking skills, problem solving skills, and academic achievement of students.

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