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Improving IPAS Learning Outcome using the Problem-Based Learning Model in Elementary School

Migdes Christianto Kause[1], Halani F. Sunbanu[1*],Yefris A. Selan[2], Reza Maulana[2]

[1]EmentaryTeacher Education, Institut Pendidikan Soe, Soe, Indonesia
[2]EmentaryTeacher Education, Universitas Pamulang,Pamulang, Indonesia
[*]e-mail: 29migdeskause@gmail.com

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Abstract: The low level of Mastery of Minimum Competencies among students is caused by students still experiencing difficulties in developing their critical thinking skills. In classroom learning, students still have difficulty understanding literacy and numeracy. The aim of this research is to determine the increase in the ability to master minimum competencies in elementary school students using the Problem-Based Learning model. The method used in this research is quantitative research, with an experimental research design. The experimental method has several designs, one of which is the quasi-experimental method (quasi-experimental). The sample in this research was students at Cibadak Elementary School, Bogor. The sampling technique used is non-random sampling, where the research sample is taken not at random. The research results show that there is an increase in students' mastery of minimum competencies by using the Problem-Based Learning model. This is shown by the calculated t value obtained being greater than the t table with the calculated T value of 2.46, while the T table value is 1.65; this result shows that there is an increase in the use of the PBL model in improving students' Minimum Competency Assessment (MCA) abilities. Meanwhile, the results of calculating the N-Gain value obtained a value of 0.73% in the high category. This is because the use of the Problem-Based Learning model can facilitate students to be actively involved in learning, so that students' understanding of literacy and numeracy questions can increase.

Keywords: Learning Outcome; Minimum Competency Assessment (MCA); Problem-Based Learning.

Introduction

The government sets national education standards as part of efforts to improve the quality of education. This standard contains minimum standards regarding educational elements, enabling each level and pathway of education to develop education optimally in accordance with the characteristics and particularities of its program. According to PP 19 of 2005, "there are eight National Education Standards as stated in Article 2 Paragraph (1), which include graduate competency standards, content standards, process standards, education and education personnel standards, facilities and infrastructure standards, management standards, financing standards and assessment standards." In addition, the government takes other steps to ensure the quality of education [1]. One important element of the educational component is educational evaluation. However, not all types of evaluation are suitable for assessing how far educational goals have been achieved. The evaluation measuring tools used must be appropriate and able to measure all objectives; otherwise, the results will be inaccurate or even completely wrong. Educational success can be measured using relevant measuring tools. For all levels, units and types of education, evaluations can be carried out on students, institutions and educational programs in both formal and non-formal channels. Therefore, every evaluation process must be based on the principle of improving the quality of education, so that every evaluation is an effort to improve the quality of education. Evaluation is an integral component of planning and implementing learning. They also function as a measure of the level of achievement of learning indicators and as information that shows students' development in various aspects [2]. Evaluation results not only show the results or value of learning but also show the success of the school during the learning process.

One of the metrics used in the independent curriculum is assessment using manual work tools. Minimum Competency Assessment (MCA) is an assessment of basic competencies or abilities carried out on students so that they can develop their abilities and implement them in everyday life. In this case, the basic competencies assessed in MCA are reading literacy and numeracy [3]. MCA is designed to educate students to face the 21st century, they must have four abilities: critical thinking and problem solving, creativity, communication and collaboration. The competency domain in MCA is structured around three abilities, namely determining, understanding and reflecting, with questions presented in the form of multiple choice, complex multiple choice, matching, short essay and description. The MCA competency domain consists of three abilities: determining, understanding, and reflecting. The questions presented include multiple choice, complex multiple choice, matching, short answers, and descriptions. Minimum Competency Assessment is the application of the use of assessment tools to obtain as much information as possible about the extent to which students have succeeded in mastering certain competencies. The Minimum Competency Assessment (MCA) is held to obtain information to improve the quality of learning, so that it is

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hoped that it will also improve student learning outcomes. The assessment not only measures mastery of knowledge material according to the curriculum, but is specifically designed to determine the overall quality of education and make improvements to the quality of education that is felt to be lacking. The focus of MCA is on fulfilling reading literacy and numeracy literacy skills in students [4].

Students' ability to find information is often needed in everyday life. At this cognitive level, students hope to be able to find, identify and describe an idea or explicit information in the text. The ability to find specific information is a basic ability needed by students when reading an informational text. If students master this competency, they can find information explicitly in the text. Students' ability to understand text, interpret and integrate [5]. At this cognitive level, students hope to be able to process what they have read so that understanding arises within themselves from the text (interpret and integrate). To be able to understand the text, students must describe and integrate the information found by comparing ideas or information in a text. Students' ability to evaluate and reflect, the highest cognitive level in reading, is to evaluate and reflect. Students who reach this stage can use knowledge, ideas or attitudes that are outside the text to make judgments on the text or reflect on it. The competency possessed by students who are able to evaluate and reflect is the ability to analyze, predict and assess language content and elements in Cahaya texts [6]. One learning model that can be used in elementary school learning is Problem-Based Learning.

The problem-based learning model uses problems as the main source for teaching students. The aim of this model is to help students gain knowledge through critical thinking and problem solving [7]. This means that the Problem-Based Learning model is a model that can be used to teach students about problems, so that they can develop and train themselves to be active and think critically to deal with shared problems. This is in accordance with the purpose of the MCA, which is designed so that students can develop 21st-century skills. The problem-based learning model emphasizes the problem-solving process, giving students more responsibility for learning. In this learning model, problems, questions, and facilitation of inquiry are the teacher's job. Problem-based education is not possible without teachers creating a classroom environment that supports the open exchange of ideas [8].

Basic education has an important role in building the foundation for learning at a higher level. At this stage, children are introduced to various fundamental scientific disciplines, including natural science education. Through basic education, students are invited to understand the environment around them in an interesting and interactive way so that learning is more meaningful. Science learning is an activity of finding out about nature systematically. ScienceJ is not just the mastery of transferring several theories, formulas, laws and principles from teachers' books to students' books. Science learning emphasizes providing direct experience to develop competencies so that learning is more meaningful [9]. Students become more active in proving hypotheses or theories in the book, while the teacher acts as a facilitator and motivator who guides students when learning. The scope of science study materials for elementary schools includes material about force, and within force, there are sub-materials on gravitational force, frictional force and magnetism.

The aim of science learning in elementary schools is to foster students' love of natural phenomena and their environment. Exploratory and experimental activities teach students good observation skills, which help them observe and analyze changes that occur in nature. Students are expected to gain a better understanding of scientific concepts and critical thinking skills needed to solve various problems with these skills. By understanding the basic concepts in science, they are expected to be able to relate scientific knowledge to everyday life. This will form a positive attitude towards science and encourage them to continue learning and exploring further [10].

Problems can be proposed or given by the teacher to students, from students together with the teacher, or from students themselves, which are then used as discussions and solutions are sought as student learning activities. Thus, PBL, Problem-Based Learning, is a learning model that focuses on tracking the root of the problem and solving the problem so that students are able to improve critical thinking skills. The results of observations at SD Cibadak Bogor showed that the low MCA was due to the students' literacy and numeracy skills still being very low.

Research Methods

The method used in this research is quantitative research with an experimental design. The experimental method has several designs, one of which is the quasi-experimental method (quasi-experimental).

Table 1. Research Design

Class	Pretest	Treatment	Postest
Experiment	O1	X	O3
Control	O2	-	O4

Table 2. N-Gain Classification

Value Range	Classification
$g > 0.70$	High
$0.30 \geq g \geq 0.70$	Currently
$g < 0.30$	Low

The experimental class will be given treatment, namely using the Problem-Based Learning model, while the control class will use conventional learning. In the experimental class, an initial test (Pretest) will be given to determine the students' initial understanding. After that, they will be given treatment using the Problem-Based Learning model, and a final test (Posttest) will be given. The population in this study were students at SD Cibadak Bogor, with the sample in this study being class IV students. The sampling technique used in this research was random sampling. The independent variable in this research is the Problem-Based Learning model, while the dependent variable in this research is MCA. The instruments used in this research were tests and observations. The data analysis techniques used in this research are prerequisite tests (Homogeneity Test and Normality Test), t-test and N-Gain test. The t-test is used to test the research hypothesis, whether the research hypothesis is rejected or accepted, while the N-Gain test is used to see the increase in MCA using the

Problem-Based Learning model. Table 2 is the N-Gain classification table:

Results and Discussion

From the research that has been carried out, the results of data normality testing are shown in Table 2. Table 3 shows the results of the data normality test using SPSS. The test results show that the data is normally distributed. Meanwhile, the results of the Homogeneity test in this study are shown in Table 4. Table 4 shows the results of the data homogeneity test using SPSS. The test results show that the data is homogeneous. Table 5 shows the results of hypothesis test calculations using SPSS.

Table 3. Data Normality Test Results

Tests of Normality[a]								
	Pre control	Kolmogorov-Smirnov[b]			Shapiro-Wilk			
		Statistic	df	Sig.	Statistic	df	Sig.	
Preexp.	30	.314	3	.	.893	3	.363	
	40	.283	4	.	.863	4	.272	
	50	.173	8	.200*	.933	8	.542	
	60	.300	5	.161	.883	5	.325	
	70	.260	2	.				

Source: IBM SPSS

Table 4. The results of the data homogeneity of variances

MCA		
Levene Statistic	df1	df2	Sig.
4.903	1	48	.032

Source: IBM SPSS

Table 5. T-test Results

Independent Samples Test

		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference		
									Lower	Upper
MCA	Equal variances assumed	4.90	.032	2.41	48	.020	8.80	3.64	1.477	16.123
	Equal variances not assumed			2.41	40.11	.020	8.80	3.64	1.439	16.161

Source: IBM SPSS

Table 5. Shows the results of the t-test using SPSS. The test results show that the calculated t value is 2.41 while the T table value is 1.65. These results show that there is an increase in the use of the PBL model in improving students' MCA abilities. Meanwhile, the results of calculating the N-Gain value obtained a value of 0.73% in the high category.

This increase occurred because the Problem-Based Learning model, in its application in the classroom, can make students more active in learning. The problems given can train students' thinking abilities. Learning with the Problem-Based Learning model can also give rise to student learning activities, in the learning process students are more actively involved in carrying out their learning tasks, have more courage to ask questions, work together in groups to solve problems, have the courage to respond or give opinions on the work of other students or groups, and present the results of their work in front of the class. The emergence of students' learning activities can increase their understanding of the material and make it more memorable because they experience the learning process themselves. Learning with students' own activities, the impression will not just pass by, but will be thought about and processed, later released again in a different form [11]. Students will ask questions, submit opinions, or discuss with the teacher, carry out orders, carry out assignments, make graphs, diagrams, and the essence of the lessons presented. If students become active participants, then they have knowledge or good knowledge. The Problem-Based Learning model can provide a meaningful experience for students to experience the learning process through group investigation activities to solve contextual problems posed by the teacher. The learning process experienced by students will result in changes in individual behaviour due to interactions between individuals and their environment, so that they are able to interact with their environment.

The Minimum Competency Assessment is an assessment of the fundamental competencies required by all students to be able to develop their own capacities and participate positively in society [12]. There are two fundamental competencies measured by MCA, namely reading literacy and numeracy literacy [13]. Competencies assessed include logical-systematic thinking skills, reasoning skills using concepts and knowledge that have been learned, and skills in sorting and processing information. MCA presents problems in various contexts, which students are expected to be able to solve using their reading literacy and numeracy competencies. Aims to improve reasoning abilities by using literacy and numeracy as well as strengthening MCA character education to obtain information to find out students' achievements in the competency to produce information which triggers

improvements in the quality of teaching and learning, which in turn can improve student learning outcomes [14]. Reporting MCA results is designed to provide information regarding students' competency levels. This level of competency can be utilized by teachers of various subjects to develop effective and quality learning strategies according to the level of student achievement, the role of the PBL model in the style of material designed by considering the level of achievement of students who are critical of mastering the material or competencies in the MCA questions.

The Problem-Based Learning model can improve numeracy literacy through problems that can be solved by applying various knowledge into everyday life [15-17]. Providing problems in learning can help students solve MCA questions. In line, Problem-Based Learning is a learning approach that uses problems in everyday life as a context for students to be able to learn to develop critical thinking and problem-solving skills, whereby using critical thinking skills, students can solve MCA questions [18-20].

Conclusion

The conclusion of this research is that there is an influence of the Problem-Based Learning model on increasing MCA's abilities in class IV style material. The results of students' MCA abilities in science-style material have increased; these results are shown by testing the Hypothesis. The average value of students' MCA abilities has increased by 0.73% in the high category. The results are shown by calculating N-Gain. This increase occurred because the use of the Problem-Based Learning Model can make students develop critical thinking skills, which influence students' ability to solve MCA questions. Apart from that, problem-based learning can be used by teachers to improve students' abilities in solving problems in MCA questions.

Author's Contribution

Migdes Christianto Kause: Responsible for the main idea, research design, data analysis, and article drafting. Halani F. Sunbanu: Data collection and data processing. Yefris A. Selan: Editing according to the journal template. Maulana: Editing according to the journal template.

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