Problem-Based Learning Model to Increase Students' Critical Thinking

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Abstrak

Penelitian ini bertujuan untuk mendeskripsikan penerapan model pembelajaran berbasis masalah (PBL) terhadap keterampilan berpikir kritis siswa kelas V Sekolah Dasar. Metode yang digunakan dalam penelitian ini adalah penelitian tindakan kelas. Dalam penelitian ini terdapat dua data yaitu data verbal dan data nonverbal. Subyek penelitian ini adalah siswa sekolah dasar kelas 5 di kota Madiun. Pengumpulan data menggunakan teknik observasi, wawancara dan tes. Instrumen dalam penelitian ini menggunakan angket dan tes. Teknik analisis data dalam penelitian ini adalah analisis data kuantitatif dan kualitatif. Analisis data kualitatif menggunakan data angket dan observasi, sedangkan data kuantitatif menggunakan hasil tes. Hasil penelitian ini menunjukkan adanya peningkatan kemampuan berpikir kritis siswa pada pembelajaran tematik dari siklus 1 dan siklus 2. Peningkatan kemampuan berpikir kritis siswa pada siklus I sebesar 30%, siswa yang lulus KKM, dan 60% siklus kedua di setiap siklus. Semakin banyak siswa mengalami peningkatan kemampuan berpikir kritisnya.
Kata Kunci: Keterampilan berpikir kritis, Pembelajaran berbasis masalah, Pembelajaran tematik.

Abstract

This study aims to describe the application of problem-based learning (PBL) models to the critical thinking skills of 5th graders at Elementary School. The method used in this research is classroom action research. In this study, there are two data, namely verbal data and nonverbal data. The research subjects were elementary school students in grade 5 in the city of Madiun. The collecting data was using observation techniques, interviews, and tests. The instrument in this study used a questionnaire and a test. The data analysis technique in this research is quantitative and qualitative data analysis. Qualitative data analysis uses questionnaire data and observation, while quantitative data uses test results. The results of this study indicate an increase in students' critical thinking skills in thematic learning from cycle 1 and cycle 2. An increase in students' critical thinking skills in cycle 1 is 30%, for students who pass the Minimum Completeness Criteria, and 60% for the second cycle each cycle. The more students experience an increase in their critical thinking skills.
Keywords: Critical thinking skills, Problem-based learning, Thematic learning.

INTRODUCTION

In the era of the 21st century, competition in the world of work is getting tougher. For students to have high competitiveness, students need to be equipped with high-level thinking skills. It is based on the fact that when entering the workforce, students lack higher-order thinking skills, the ability to diagnose and solve problems, apply their skills to new, unfamiliar problems, and work effectively in groups. Higher-order thinking skills need to be developed by teachers in the implementation of learning activities for several reasons; first, currently, students are entering the information age where students are surrounded by complete information. In addition, the information around students is not necessarily true, so in this case, students need to be equipped with skills in processing and applying the information obtained to become smart citizens and participate in the life of a democratic society.Higher-order thinking skills have a higher level of thinking than memorizing facts or retelling something heard. Memorizing facts or retelling are included in low-level thinking skills because students are similar to robots that only repeat what they get and do what they are told so that they don't do it through a deep thinking process, (Yuliati & Lestari, 2018). HOTS is more an act of concluding, connecting with facts and other concepts, manipulating, categorizing, combining in new ways, and applying them to find new solutions to new problems, (Wiyaka et al., 2020).

Several problems exist in the world of education, namely the problem of the weakness of the learning process. Students are less encouraged to develop thinking skills in the learning process, especially students' critical thinking in solving a problem well. Critical thinking skills demand how students get real and relevant insights. It must use reflection, responsibility, and expertise in critical thinking, (Fetra Bonita Sari, Risda Amini, 2020). Critical thinking skills need to be grown as early as possible. This is important because, In real everyday life, humans are always faced with various problems that require appropriate solutions to not interfere with the comfort in carrying out their lives, (Aisyah, 2019).

The learning process in thematic learning in elementary schools in Madiun lacks variety in transmitting knowledge. The application of unattractive learning models causes students to be bored and not enthusiastic about participating in learning activities. As a result, the class becomes passive, and students' higher order thinking levels cannot develop. With higher-order thinking, students can improve their learning outcomes. It is the learning model that must be developed in thematic learning and the teacher's way of teaching in the classroom. The selection and use of the right learning model can be a success factor in forming students' critical thinking skills. With the applied learning model, it is expected to form and develop critical thinking skills. One of the learning models that are thought to facilitate students' critical thinking processes is the problem-based learning model.

The PBL method asks students to acquire and develop core learning concepts through collaborative projects that require learning and application of contextual knowledge, (Brata & Mahatmaharti, 2020). The problem-based learning model is a method that requires finding a sound or practical solution to a particular problem through conducting research. PBL is integrated with inquiry-based learning through mentors who trigger higher-order thinking and act as facilitators who help improve the learning process to arrive at the information needed, (Ansari et al., 2015). PBL is an instructional method in which relevant problems are introduced early in the instruction cycle and provide context and motivation for subsequent learning, (Buheji & Buheji, 2020). The PBL model is a learning model that uses real-world problems as a context for students to learn about critical thinking and problem-solving skills and acquire knowledge and concepts that are the core of the subject, (Aydin, 2014). The teacher actively and collaboratively carries out PBL learning activities so that students have more opportunities to exchange ideas and criticize various opinions submitted by friends to solve the problems presented.

Thus, without the need to memorize knowledge, students will gain the ability to conceptualize learning. One approach that targets learning through self-experience and finding knowledge uses a problem-based

learning model. The learning process using a problem-based learning model is formed in groups, where there is a small collaborative group consisting of 6 or 8 students with guidance from the teacher. They solve problems or problems that must discuss by the teacher. The PBL learning model positively affects students' academic achievement and attitudes towards learning and developing students' concepts and misconceptions in the classroom, (Hairuddin et al., 2018). The PBL learning model is the key for students to transfer the knowledge and skills they learn in math class to real life and solve everyday problems, (Nazir Md. Zabit et al., 2020). Problem Based Learning requires students to be more active in the learning process because students rely on the teacher as a source of information and take advantage of other learning resources. The facts show that problem-based learning can effectively facilitate students' argumentation skills, control variables, and theoretical reasoning skills,(Lile & Kelemen, 2014). PBL has the characteristics of collaborative, communicative, and cooperative learning. Students work in groups, interact, work together (peer teaching) and make presentations, (Hussin et al., 2018).

Overall the results of this study are different from previous studies. In particular, research conducted by (Septiyowati & Prasetyo, 2021) Which states that the problem-based learning model learning has more effect on increasing students' critical thinking skills than the model Brainstorming learning. Also different from the results of research conducted by (Lestari et al., 2017) PBL was able to improve students' critical thinking in vocational learning. PBL can lead students to solve problems and live through the process of discovering, learning, and thinking independently. Also different from the results of research conducted by (Arensd, 2019) PBL model can improve student learning outcomes in aspects of cognitive, affective, and psychomotor. PBL applies more concepts, process learning, and problem-solving in the world for students.

The PBL learning model provides opportunities for students to acquire skills in problem-solving so that they can be developed higher-order thinking skills, (Jarrar, 2020). The difference between the first work with the author's writing is that this paper reviews all applications whether they can create a learning atmosphere effectively, and improve students' critical thinking in thematic learning by using problem-based learning models. The novelty of this research is to develop students' critical thinking in the classroom using a problem-based learning model. Therefore, this study aims to close this gap by examining the effect of the PBL learning model on higher order thinking skills. The results of this study contribute as useful insights for teachers to develop high-order thinking skills of elementary school students.

RESEARCH METHOD

The research used is Classroom Action Research (CAR). Classroom action research is an effort to observe the learning activities of a group of students by providing an action (treatment) that is deliberately raised" (Mulyasa, 2011: 11). The specific purpose of this CAR (classroom action research) is to provide improvements and improvements to teacher services in overcoming problems that exist in the teaching and learning process. Classroom action research collects data about the implementation of various activities, successes, and problems that arise, analyzes them, develops plans, and carries out improvement activities to improve the quality of classroom action research.

Data collection techniques used questionnaires and tests to determine students' critical thinking skills. This classroom action research can be successful if it can improve critical thinking skills in the thematic learning of fifth-grade students at SDN 1 Pilangbango. Suppose there is an increase of $\geq 50\%$ of all students (classically). In that case, I can be categorized that research on improving critical thinking skills in the thematic learning of fifth-grade students at SDN 1 Pilangbango using a problem-based learning model is successful. This research aims to use a problem-based learning model to improve critical thinking skills in thematic learning of fifth-grade students at SDN 1 Pilangbango. The subjects of this study were fifth-grade students of SDN 1 Pilangbango. The data analysis technique used qualitative and quantitative data analysis.

RESULT AND DISCUSSION

Based on the results of research with Problem Based Learning learning models on students' critical thinking skills, the comparison can be seen from the results of the assessment cycle 1 and cycle 2. This can be seen in the table and diagram below:

1. Implementation of Cycle I

Table 1
Critical Thinking Skills

Interval	Category	Cycle 1		Percent (%)		Average	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
0-30	Very low	5	3	16,1	9,66		
31-50	Low	5	2	16,1	6,44		
51-70	Currently	15	18	48,3	57,96	62	65
71-90	Tall	3	5	9,66	16,1		
91-100	Very high	2	2	6,44	6,44		

It seems that the critical thinking ability of students in thematic learning is that one student has very low thinking skills with a percentage value of 16.1%. In addition, some students achieve moderate thinking skills with a percentage value of 30%. The average pretest score showed a result of 63. Then the second cycle had to be carried out to find errors in learning that were predicted due to conceptual errors in applying the steps of the Problem-based learning model. Statistics on the results of students' critical thinking skills can be seen in the following diagram:

Figure 1. Frequency graph of critical thinking ability Cycle 1

2. Implementation of Cycle II

Table 2
Critical Thinking Skills

Interval	Category	Cycle 1		Percent (%)		Average	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
0-30	Very low	0	0	0	0		
31-50	Low	5	2	16,1	6,44		
51-70	Currently	6	10	19,32	32,2	75	85
71-90	Tall	18	17	57,96	54,74		
91-100	Very high	1	1	3,22	6,44		

Based on the research table above, it can seem that the critical thinking ability of students in thematic learning is that there is one student who has very low thinking skills with a percentage value of 0%. In addition, some students achieve moderate thinking skills with a process value of 32.2%. The average pretest score shows a result of 75, which indicates that students can use students critical thinking skills in thematic learning, judging by the average value of the class that has exceeded the KKM 70 from the indicators determined by the school. While the average post-test score of 85 means that all students have completed using the problem-based learning model with an increase in students' critical thinking skills in thematic learning. The average result of the percentage increase in student scores obtained is 60%. So it can be concluded that the application of the problem-

based learning model in cycle I mostly have medium and high categories. Statistics of student ability results can be seen in the following diagram:

Figure 2. Frequency graph of critical thinking ability Cycle 2

In cycle 1, researchers have applied the Problem Based Learning learning model; even though the implementation was not perfect, students with critical thinking skills increased to 30%. In cycle 2, the researchers and teachers improved all learning activities in the previous cycle. In cycle 2, the researchers asked the teacher to implement the problem-based learning model according to the revised learning steps. This affects increasing students' critical thinking skills, which is 61%. The increasing critical thinking skills of students in thematic learning. This can be seen in the results of the first cycle getting an average score of 30%, and in the second cycle, there is an increase by getting a score of 60%. In cycle 1, researchers have applied the Problem Based Learning learning model. Even though the implementation is not perfect, students with critical thinking skills increased to 30%. In cycle 2, the researchers and teachers improved all learning activities in the previous cycle. In cycle 2, the researchers asked the teacher to implement the problem-based learning model according to the revised learning steps. This affects increasing students' critical thinking skills, which are 61%. The increasing critical thinking skills of students in thematic learning. This can be seen in the results of the first cycle getting an average score of 30%, and in the second cycle, there is an increase by getting a score of 60%.

Based on the description above, applying the Problem Based Learning learning model in-class students of SDN 1 Pilangbango can improve students' critical thinking skills in thematic learning. The results of this study strengthen the previous research conducted by Wulandari & Shofiyah, 2018, the study results showed an increase in expressing opinions after the PBL learning model was applied. The ability to argue as a supporter of achievement increases. This increase is marked by student involvement in learning through opinion activities. Anxiety that affects a person's opinion can be eroded by increasing understanding of theories or concepts in the subject matter. The PBL learning model plays a role in developing thinking and problem-solving skills. The success of applying the PBL learning model in developing students' higher-order thinking skills is caused by several things. First, in applying the PBL learning model, the teacher uses real problems for students. The teacher asks students to find a solution that fits the existing problem through this problem. To overcome these problems, students will acquire higher-order thinking skills. In applying the PBL learning model, the teacher provides opportunities for students to be active and use their experience to solve the problems they face so that students can develop higher-order thinking skills.

The difference between the first work with the author's writing is that this paper reviews all applications whether they can create a learning atmosphere effectively, and improve students' critical thinking in thematic learning by using problem-based learning models. The novelty of this research is to develop students' critical thinking in the classroom using a problem-based learning model. Problem-based learning model also requires students to collaborate with other students to solve a problem. The results of this study are in line with previous research studies conducted by (Hussin et al., 2018), (Wulandari & Shofiyah, 2018) and (Ansari et al., 2015), that Problem-based learning model learning has a positive impact on efforts to improve skills students think critically. To realize learning-oriented critical thinking skills, education must be optimized through challenging learning for students so that the process of assimilation and accommodation can produce intellectual growth,

(Azis et al., 2016). In the learning process, there is a learning experience that students can well receive to improve learning outcomes and critical thinking skills in learning. It will be more structured to shape cognitive learning through psychomotor or affective aspects, (Utami et al., 2018); (Noprianda et al., 2019).

Problem-Based Learning more affects students' critical thinking skills than the learning model that has been applied in schools. In addition, other research states that Problem Based Learning is more effective than model classics. Problem Based Learning shows that many students like this model. This research is useful to provide an alternative thematic learning design through the Problem Based Learning model. It is hoped that it can improve the ability of teachers to encourage elementary school students to think critically and is expected to improve the thinking critical of students in the learning process. Based on the study results, it can conclude that the application of the problem-based learning model can improve students' critical thinking skills in thematic learning; by looking at the results of cycles 1 and 2, there is an increase in the process. Active teacher activities in the classroom can make the learning atmosphere more active and attract students' attention to learning activities.

CONCLUSION

Based on the research and discussion above, it can conclude that the application of the problem-based learning model can improve critical thinking skills in thematic learning at SDN 1 Pilangbango Madiun. It can be seen in the first cycle results with a value in the first cycle of 30%. Students who pass the Minimum Completeness Criteria and the second cycle 60%. Judging from Cycle I and Cycle II, which continued to increase and learning in the classroom experienced changes for the better. This can be proven when learning activities become more interesting and fun so that learning becomes more meaningful and trains student activity. Students' critical thinking skills that occur during learning are very visible. In carrying out the learning process, the teacher can apply the problem-based learning model to improve students' critical thinking skills. It is hoped that the problem-based learning model can be a means for active practice in the teaching and learning process.

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