

Application of Problem Based Learning Model to Improve Students' Critical Thinking Skills

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1. Abstract

The background of this classroom action research is due to low critical thinking skills in learning. The purpose of the study was to improve students' critical thinking skills by using the Problem Based Learning model. This class action research was carried out according to the model of Kemmis & Mc. Targgart. The research process is carried out in two cycles, each cycle there are two learnings. The stages of each cycle are planning, execution, observation, and reflection. The instruments used are post-test to determine critical thinking skills and observation sheets to determine teacher activities, student activities and student responses to the application of the Problem Based Learning model. The object of research is grade IV elementary school students in one of the cities of Yogyakarta. The result of this study is that students' critical thinking skills increased from the initial condition (pre-cycle) which is 43.2 (less category) to 80.25 (good category) at the end of cycle II condition. The conclusion of these results is that the application of the Problem Based Learning learning model can improve students' critical thinking skills.

Keywords: *critical thinking skills, problem based learning*

2. Introduction

The current education process is influenced by many factors, including: student input, educational facilities and infrastructure, teaching materials, administration, human resources that are able to support the creation of a conducive atmosphere. The educational process that pays attention to the educational component is expected to produce quality

students. Education plays an important role in producing quality generations. So, teachers have the responsibility to improve the quality, creativity, and potential development of learners.

Learning takes place as a process that influences each other between teachers and students in teaching and learning activities. The ability to think critically is one that must be trained in students so that students' critical thinking skills are very important in ensuring learning success (Sulistyowarni et al, 2019). Learning is said to be able to improve critical thinking skills if students are actively involved, both physically, mentally and socially in the learning process. The importance of developing critical thinking skills, in fact, has not been in line with current learning conditions. One of the problems faced in Indonesia is the weakness of the learning process, students are not encouraged to improve their thinking skills, and learning in class only memorizes material without requiring students to remember what they learned before (Amijaya et al, 2018). Based on the above, teacher efforts in developing students' critical thinking skills are very important, because students' critical thinking skills are decisive for the success of the learning carried out.

According to Fatriani & Sukidjo (2018), critical thinking is defined as a way of thinking that combines skill ideas such as using, analyzing, synthesizing, evaluating, and generalizing. Critical thinking demands a hard effort to examine every belief or assumptive knowledge based on its supporting evidence and the follow-up conclusions resulting from the analysis (Mahardiningrum & Ratu, 2018). Critical thinking allows students to find the truth and choose the right information to use in everyday life (Cahyani & Saptoru, 2021). So, it can be concluded that critical thinking is the ability of students in critical thinking to analyze, express and solve a problem.

One way to make classroom learning fun and achieve learning goals is to use a learning model. The learning model needed is an active, creative, innovative, effective and

fun learning model. The selection of learning models must be in accordance with the material to be discussed so as to attract students' attention to active learning and try to optimize all the abilities they have to achieve the expected learning goals and help students develop critical thinking skills in solving problems (Prasetyo & Kristin, 2022). One of the models used in learning to improve students' critical thinking skills is the Problem Based Learning model because the application of the Problem Based Learning model can train students to think critically and how to solve problems in real life.

Anugraheni (2018) explained that the Problem Based Learning learning model is a learning model that involves students in learning activities and uses problem solving and critical thinking as a basis for acquiring knowledge and concepts. This problem occurs everywhere, whether at school, at home, or in the community. Using a problem-based learning model, teachers can activate learning activities and provide students with problems that require critical thinking to solve and solve.

Research conducted by Saputri (2020) found that the use of the Problem Based Learning model can improve critical thinking skills. In line with Nurkhasanah's research, Wahyudi & Indarini (2019) also revealed that applying Problem Based Learning which is used to stimulate critical thinking gets positive results, namely an increase occurs after carrying out the second cycle. Based on several studies, it can be concluded that the use of the Problem Based Learning model can improve students' critical thinking skills.

Based on the results of observations made on grade IV students at one of the Yogyakarta City Elementary Schools, during the learning process it was known that learning still did not involve students. Teachers are still dominant in the learning process. Teachers have not provided opportunities in learning to encourage students to think critically. In addition, students in the learning process are less active and lack the courage to express their opinions. Because the learning process carried out by the teacher is more directed

towards lectures. Meanwhile, from the pre-test results, critical thinking skills are in the less critical category with a value of 43.20.

The Problem Based Learning model can be a solution to overcome students' low critical thinking skills. Using this, model students are taught how to solve a problem. In solving problems there are steps that demand students' ability to think critically. Simanjuntak & Sudibjo (2019) explained that the use of problem-based learning models can improve critical thinking skills if applied correctly in accordance with the principles and syntax that have been prepared and adjusted to the learning to be carried out. By applying the Problem Based Learning learning model, students will also know how to solve a problem. This method of solving problems can be applied to solve problems in real life.

Based on the description above, researchers are interested in applying the Problem Based Learning model to improve students' critical thinking skills.

3. Methods

This type of research is classroom action research (PTK). Classroom action research is an activity to learn something using certain rules to get useful information and aims to improve the quality of learning (Noviana & Huda, 2018). This study used models from Kemmis & Mc. Taggart. The stages of the Kemmis & Mc Taggart model PTK include: planning, implementation and observation (act & observe), and reflection (Machali, 2022). At the planning stage, researchers make all learning tools, including, lesson plans (RPP), instruments, and observation sheets for the implementation of teacher and student activities to observe the implementation of the learning process.

At the implementation stage, researchers apply learning models that have been integrated into the lesson plan (RPP), and at the observation stage, researchers provide observation sheets on the implementation of teacher and student activities to observe the implementation of the learning process. At the end of the action, students' critical thinking

skills are assessed through essays that are done individually. In the reflection stage, the researchers reviewed the findings obtained from applying the action each cycle.

The research was carried out in two cycles according to the steps of PTK according to Kemmis & Mc. Taggart. The subjects of this study were grade IV elementary school students in one of the cities of Yogyakarta, totaling 28 students with implementation time in the second semester of the 2022/2023 academic year. The data obtained in this study includes qualitative data and quantitative data where qualitative data includes data obtained through observation sheets of the implementation of teacher and student activities in each cycle, while quantitative data includes the results of tests of students' critical thinking skills. The value of students' critical thinking skills is analyzed using the following formula.

$$Value = \frac{\text{Scored Obtained}}{\text{Maximum Score}} \times 100$$

With the following criteria for critical thinking skills:

Tabel 1. Criteria for Critical Thinking Skills

Gain Scale	Category
81,25-100	Very Good
62,50-81,25	Good
43,75-62,50	Currently
25,00-43,75	Less
<25,00	Very Less

Setyowati et al (in Ratnasari et al, 2019)

Indicators of critical thinking ability are in the range of 62.50-81.25, which is a good category. If the class has not reached these indicators, then action research is continued

in the next cycle. The actions selected in this cycle are planned based on the results of reflections of the actions of the previous cycle.

4. Results and Discussion

Pre-cycle activities are used to determine the initial state of the object of research, in this case grade IV elementary school students in one of the cities of Yogyakarta. Pre-cycle activities are carried out by conducting interviews with class teachers, making observations during learning and providing test questions to find out students' abilities. In this activity, researchers found that critical thinking skills were in the less critical category with a value of 43.20. Furthermore, researchers prepare learning tools in the form of learning implementation plans (RPP), student worksheets (LKPD), teaching materials, teaching media, and evaluation questions for activities in cycle I and cycle II.

Cycle I is carried out by doing 4 steps in accordance with the research model that has been implemented. In this cycle, researchers conduct two lessons, and at the end of the second learning an evaluation of students' critical thinking skills is carried out. Learning is carried out by applying the Problem Based Learning model. The steps of the Problem Based Learning learning model include orienting students to problems, organizing students to learn, assisting independent and group investigations, developing and presenting works, and analyzing and evaluating problem solving (Shofiyah & Wulandari, 2018). The students' critical thinking skills obtained after giving evaluations still did not meet the success indicators in this study, which was in the medium category with a value of 61.10.

Based on the results of observations in the first cycle, several shortcomings were found during the learning process, namely the lack of student response when the teacher allowed to give responses to material that was not understood, students were less accustomed to expressing their opinions. This was also encountered during the discussion. From the shortcomings found in cycle I, there is a need for reflection and the need for

cycle II. The solution to the problems found is to stimulate students to express their opinions, the teacher guides and directs and holds rewards in the form of points for activeness. As described by the stimuli given in the form of additional point rewards, and praise for their courage to express their opinions, making students more responsive. For the provision of material that is poorly understood, the teacher reciprocates students to find out indicators that have not been understood and need to re-explain.

Cycle II is carried out by carrying out 4 steps in accordance with the research model that has been implemented. In this cycle, researchers conduct two lessons, and at the end of the second learning an evaluation of students' critical thinking skills is carried out. Learning is carried out by applying the Problem Based Learning model. The students' critical thinking skills obtained after giving an evaluation have met this success indicator, which is in the good category with a value of 80.25. So, it has met the critical thinking ability indicator, which is vulnerable 65.0-81.25 of all students who took the test. For more details, the comparison between the results of the pre-cycle, cycle I and cycle II critical thinking evaluations can be seen in the following bar chart:

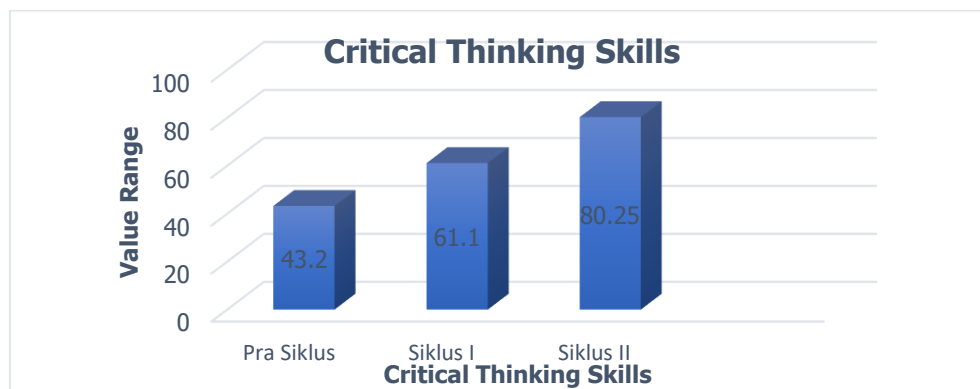


Figure 1. Average Percentage of Completion of Each Cycle

Based on the picture above, it can be seen that there was an increase in students' critical thinking skills starting from the pre-cycle, namely in the less category with a value of 43.2, in the first cycle in the medium category with a value of 61.10 and in the second cycle in the good category with a value of 80.25. Thus, the application of the Problem Based Learning learning model to grade IV elementary school students in one of the cities of Yogyakarta can improve students' ability to analyze, solve problems, conclude and evaluate. This is in line with the critical thinking indicator by Rositawati (2019), which is able to analyze, synthesize, recognize and solve problems, conclude and evaluate.

In addition, the results of this study are supported by previous research conducted by Saputri. With the title "Application of the Problem Based Learning Model to Improve the Critical Thinking Ability of Grade V Elementary School Students" the results of this study show that the use of the Problem Based Learning learning model can improve critical thinking skills. The results of this study are also in line with the research of Nurkhasanah, Wahyudi & Indarini with the title "Application of Problem Based Learning Model to Improve Critical Thinking Skills of Grade V Elementary School Students". The results of the study concluded that the application of the Problem Based Learning model can improve students' critical thinking skills.

Students' critical thinking skills improve through guiding individual as well as group inquiry activities. In this activity, students are very instrumental in thinking about the best way to solve problems. In accordance with Anugraheni's opinion (2018) about the learning model, Problem Based Learning involves students in learning activities and uses critical thinking and problem solving as a basis for acquiring knowledge. This increase occurs because the Problem Based Learning model requires students to exist in a problematic situation and solve the problem. The more students find solutions to problems, the more thinking they learn.

5. Conclusion

Based on the results of research that has been conducted, it can be concluded that the application of the Problem Based Learning model can improve the critical thinking skills of grade IV elementary school students in one of the cities of Yogyakarta from the initial state of 43.2 to 80.25.

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7. References

- Amijaya, L. S., Ramdani, A., & Merta, I. W. (2018). Pengaruh Model Pembelajaran Inkuiri Terbimbing terhadap Hasil Belajar dan Kemampuan Berpikir Kritis Peserta Didik. *Jurnal Pijar Mipa*, 13(2), 94-99.
- Anugraheni, I. (2018). Meta Analisis Model Pembelajaran Problem Based Learning dalam Meningkatkan Keterampilan Berpikir Kritis di Sekolah Dasar [A Meta-analysis of Problem-Based Learning Models in Increasing Critical Thinking Skills in Elementary Schools]. *Polyglot: Jurnal Ilmiah*, 14(1), 9-18.
- Cahyani, H. D., Hadiyanti, A. H. D., & Saptoro, A. (2021). Peningkatan sikap kedisiplinan dan kemampuan berpikir kritis siswa dengan penerapan model pembelajaran problem based learning. *Edukatif: Jurnal Ilmu Pendidikan*, 3(3), 919-927.
- Fatriani, E., & Sukidjo. (2018). Efektivitas Metode Problem Based Learning Ditinjau dari Kemampuan Berpikir Kritis dan Sikap Sosial Siswa. *Jurnal Ilmu Sosial*, 15(1), 11–26.
- Machali, I. (2022). Bagaimana Melakukan Penelitian Tindakan Kelas Bagi Guru. *IJAR*, 1(2).

- Mahardiningrum, A. S., & Ratu, N. (2018). Profil Pemecahan Masalah Matematika Siswa SMP Pangudi Luhur Salatiga Ditinjau dari Berpikir Kritis. Mosharafa: *Jurnal Pendidikan Matematika*, 7(1), 75-84.
- Noviana, E., & Huda, M. N. (2018). Penerapan model pembelajaran kooperatif tipe STAD untuk meningkatkan hasil belajar PKN siswa kelas IV SD Negeri 79 Pekanbaru. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, 7(2), 204-210.
- Nurkhasanah, D., Wahyudi, W., & Indarini, E. (2019). Penerapan Model Problem Based Learning Untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Kelas V Sd. *Satya Widya*, 35(1), 33-41.
- Prasetyo, F., & Kristin, F. (2020). Pengaruh model pembelajaran problem based learning dan model pembelajaran discovery learning terhadap kemampuan berpikir kritis siswa kelas 5 SD. *Didaktika Tauhidi: Jurnal Pendidikan Guru Sekolah Dasar*, 7(1), 13-27.
- Ratnasari, N., Sarwanto, S., & Prayitno, B. A. (2019). Profil Awal Keterampilan Berpikir Kritis IPA Peserta Didik Kelas Viii-A MTS PSM Tanen-Rejotangan. In *Prosiding SNPS (Seminar Nasional Pendidikan Sains)* (pp. 239-243).
- Rositawati, D. N. (2019). Kajian berpikir kritis pada metode inkuiri. In *Prosiding SNFA (Seminar Nasional Fisika Dan Aplikasinya)* (Vol. 3, pp. 74-84).
- Saputri, M. A. (2020). Penerapan model pembelajaran *Problem Based Learning* untuk meningkatkan kemampuan berfikir kritis siswa kelas V sekolah dasar. *Jurnal Pendidikan Dan Konseling (JPDK)*, 2(1), 92-98.
- Shofiyah, N., & Wulandari, F. E. (2018). Model problem based learning (PBL) dalam melatih scientific reasoning siswa. *Jurnal Penelitian Pendidikan IPA*, 3(1), 33-38.
- Simanjuntak, M. F., & Sudibjo, N. (2019). Meningkatkan Keterampilan Berpikir Kritis dan Kemampuan Memecahkan Masalah Siswa Melalui Pembelajaran Berbasis Masalah [Improving Students' Critical Thinking Skills and Problem Solving Abilities Through

Problem- Based Learning]. *JOHME: Journal of Holistic Mathematics Education*, 2(2), 108.

Sulistyowarni, P. A. D Prahani, B. K., Supardi, Z. A. I., & Jatmiko, B. (2019, February). The effectiveness of OR-IPA teaching model to improve students' critical thinking skills on senior high school physics subject. *In Journal of Physics: Conference Series* (Vol. 1157, No. 3, p. 032011). IOP Publishing.