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The Effectiveness of the Problem Based Learning Model in Forming Students' Thinking Skills in the Material of Cooperation and Mutual Cooperation

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ABSTRACT

The Effectiveness of the Problem Based Learning Model in Shaping Students' Thinking Skills on Cooperative and Cooperative Materials. This study aims to find out how effective the Problem Based Learning learning model is in shaping critical thinking skills in the Youth Pledge material. The method used in this study is a quasi-experiment with a nonequivalent control group design. The samples used were class VII A as the experimental class (n=32) and VII C as the control class (n=32). The data collection techniques used in this study are instruments in the form of questionnaires, observations and documentation studies that are analyzed with alternative tests paired sample test and independent sample t-test with results of 0.000 < 0.05 which means that the Problem Based Learning learning model is effective in shaping students' critical thinking skills. This is shown from the results of the n-gain present test of the experimental class of 61.81% and the results of the n-gain present test of the control class of 34.31%. The results of the effect size test obtained a value of 2.61 which is included in the high-impact category.

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1. INTRODUCTION

Learning in general can be interpreted as a behavioral process resulting from the interaction of individuals with the environment. This behavioral change process does not occur by itself, some are consciously planned and some occur automatically due to the maturation process. The process that is consciously designed to produce this behavioral change is called the learning process. This process is a psychological/mental activity that takes place in active interaction with the environment so as to produce relatively permanent and permanent changes. Learning is a complex process that occurs in everyone and continues throughout life. Because of the complexity of learning problems, there are many theories that explain how learning occurs. Behaviorists believe that learning occurs as a result of environmental conditioning followed by reinforcement. The behavioral school assumes that learning is a change in behavior that can (Etin Solihatin, 2012).

Learning activity is an activity that can bring changes to each person for the better. Student activity in the teaching and learning process will cause high interaction between teachers and students or with other friends. This results in a conducive classroom atmosphere where each student can involve their abilities as much as possible

(Nisa et al., 2021). Learning is a process organized by the teacher so that students can carry out learning activities. Learning activities are carried out based on a design that is more prepared by the teacher (Mayasari et al., 2022). In this design, the teacher determines all learning needs including learning objectives, approaches and learning models to achieve learning objectives. If the design becomes a whole unit, a learning model is formed. Based on the results of initial observations conducted at Junior High School 1 Padaherang, it shows that students in one class VII A lack critical thinking skills, out of 32 students in one class, there are only 7 students who are enthusiastic in following the learning process, both in terms of asking, answering, refuting and so on which results in low student independence. This study aims to determine the effectiveness of the problem based learning model in shaping students' abilities in the material of working together and working together at Junior High School 1 Padaherang.

1.1 Definition of Problem Based Learning

The problem based learning (PBL) learning model is a learning model that uses real problems encountered in the environment as a basis for gaining knowledge and concepts through critical thinking and problem-solving skills. Problem based learning is a collaborative process. Students will gain knowledge by creating a portfolio of all of their own experiences and everything they have learned as a result of interactions with others. their own experiences and everything they have learned as a result of interactions with others Through PBL, it is expected to be able to solve problems using various alternative problem solving and identifying the root causes of existing problems. That students will be able to solve problems using various alternative solutions and identify the root causes of existing problems (Riyanto et al., 2024)

1.2 Critical Thinking

Critical thinking is a thinking process in which all knowledge and abilities are used to overcome, solve problems, and take effective action. To draw conclusions, data is made after identifying and evaluating previously obtained information. Critical thinking skills are primarily related to their ability to make decisions that are closest to the truth. Critical thinking skills are abilities that need to be trained and developed because they are not innate. In the context of modern learning, students must have critical thinking skills, which are one of the high-level thinking skills. Learning in the twenty-first century demands that individuals have the ability to filter information and make wise decisions. Students who have critical thinking skills will avoid trusting sources of information that are not based on facts. Critical thinking is also defined as a problem-solving process with the aim of increasing knowledge through logical and reflective thinking (Badarudin et al., 2022)

According to (Ennis, 1993) there are five groups of indicators of critical thinking skills, namely:

1) Elementary Clarification.

Basic clarification is divided into three indicators, namely (1) identifying or formulating questions, (2) analyzing arguments, and (3) asking and answering clarifying questions and/or challenging questions.

2) Providing Reasons for a Decision (The Basis for The Decision).

This stage is divided into two indicators, namely (1) considering the credibility of a source and (2) observing and considering the results of observations.

3) Conclude (Inference).

The concluding stage consists of three indicators (1) making deductions and considering the results of deductions, (2) making inductions and considering the results of inductions, and (3) making and considering the value of decisions.

4) Advanced Clarification.

This stage is divided into two indicators, namely (1) identifying terms and considering definitions and (2) referring to unstated assumptions.

5) Supposition and Integration.

This stage is divided into two indicators (1) considering and thinking logically about premises, reasons, assumptions, positions and other proposals that they do not agree with or that make them feel doubtful without letting the disagreement or doubt disturb their thoughts, and (2) combining other abilities and dispositions in making and defending a decision.

2. METHODOLOGY

a. The Effectiveness of the Problem Based Learning Model in Shaping Students' Thinking Skills on Cooperative and Cooperative Materials

This study uses a qualitative approach with a quasi-experimental study type using the Pretest-Posttest Nonequivalent Control Group Design research design where in this design there are two groups, namely the control group and the experimental group which are not selected randomly (Creswell & Creswell, 2017).

Experimental Class: O_____X_____O
Control Class: O_____V_____O

(Isnawan, 2020)

The data collection technique in this study uses tests/test questions, questionnaires, observations and documentation studies.

The research instruments used are divided into two parts, namely problem-based learning instruments and instruments to measure students' critical thinking skills. Based learning learning instruments. The critical thinking ability instrument is manifested in the initial test (pretest) and final test (posttest) of learning which are described in the form of multiple-choice questions for the control class and in the form of questions for the experimental class which are multiple-choice questions. The data analysis techniques used in this study are divided into 1) Normality Test; 2) Homogeneity Test; 3) Hypothesis Test (Sugiyono, 2013). Data analysis using n-gain test to determine the difference between the Pretest value and the posttest value. N-Gain test to determine the effectiveness of the Problem Based Learning learning model compared to the Discovery Learning model and using effect size is a measure of the effectiveness of a variable relative to other variables. Effect Size test is used to determine the effectiveness of the Problem Based Learning learning model on critical thinking skills.

3. FINDINGS AND DISCUSSIONS

The learning process of the problem based learning model between before and after treatment and at each meeting experienced an increase. This can be measured from the results of observations in the learning process and can be measured through a Likert scale questionnaire which contains statements related to the steps in the problem based learning model. According to (Rusmono, 2012) there are five steps in the problem based learning process, namely:

1. Phase 1 (Providing orientation about the problem to students)

The teacher starts by asking students to sit in a circle, after which the teacher distributes a piece of paper containing several pictures and reading texts related to the material on working together and working together, the teacher invites students to observe and read the available reading texts, and ask questions with fellow friends. After students have finished reading and asking questions, the teacher reads the available text and invites students to ask questions. In this phase, students have begun to be introduced to critical thinking skills, namely building the ability to ask questions and provide simple explanations.

2. Phase 2 (Efforts to Organize Students to be Able to Learn)

The teacher divides students into 5 groups fairly and equally, then the teacher carries out simple activities according to the instructions and distributes student worksheets to each group and the teacher gives students time to discuss with their group mates. In this phase, students are introduced to discussion skills with friends.

3. Phase 3 (Guiding Group and Individual Experience)

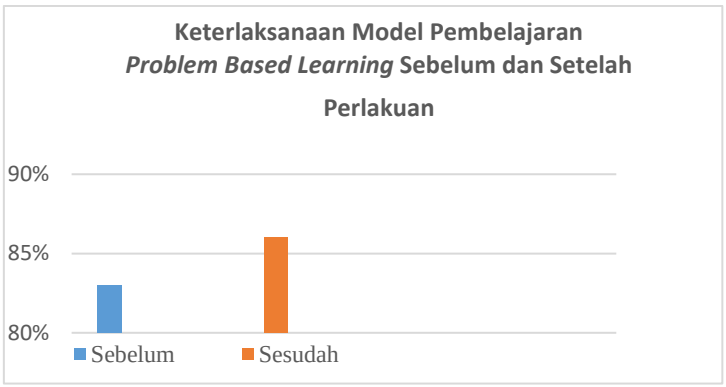
In this phase, the teacher provides an explanation to students for each question on the worksheet, the first to fourth questions are related to the application of cooperation, the fifth question students explain the benefits of working together. The teacher directs students to provide an explanation of the results of the discussion that has been carried out with their fellow group members. At this stage, students are accustomed to being responsible and able to complete tasks.

4. Phase 4 (Developing and Presenting Work Results)

In this phase, the teacher directs students to present the results of the discussion in front of all classmates, then there will be students who do not want to participate in presenting the results of their discussions. In addition, the teacher also directs other students to ask questions to the group that is presenting the results of their discussions. The findings in this phase are related to indicators of critical thinking skills, students are introduced to how to provide further explanations and organize strategies and tactics in solving problems.

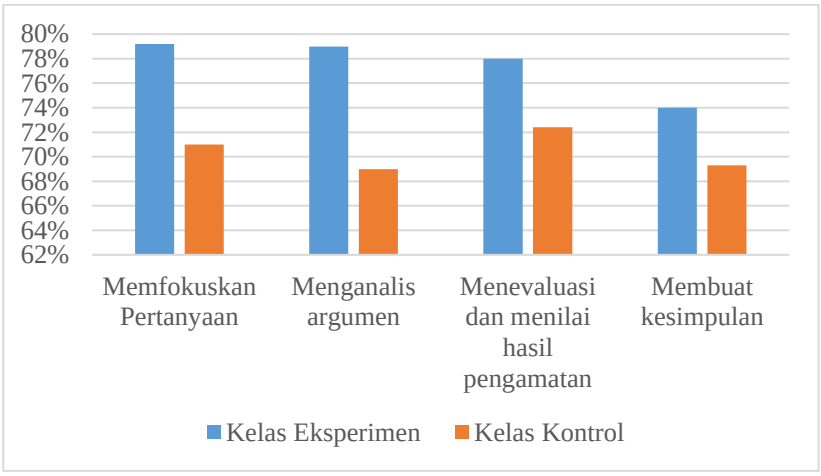
5. Phase 5 (Conducting assessment and evaluation)

In this phase, the teacher provides reinforcement related to the answers that have been presented and together with the students concludes the learning material that has been studied. The findings at this stage related to critical thinking skills are that students are introduced to the ability to conclude.



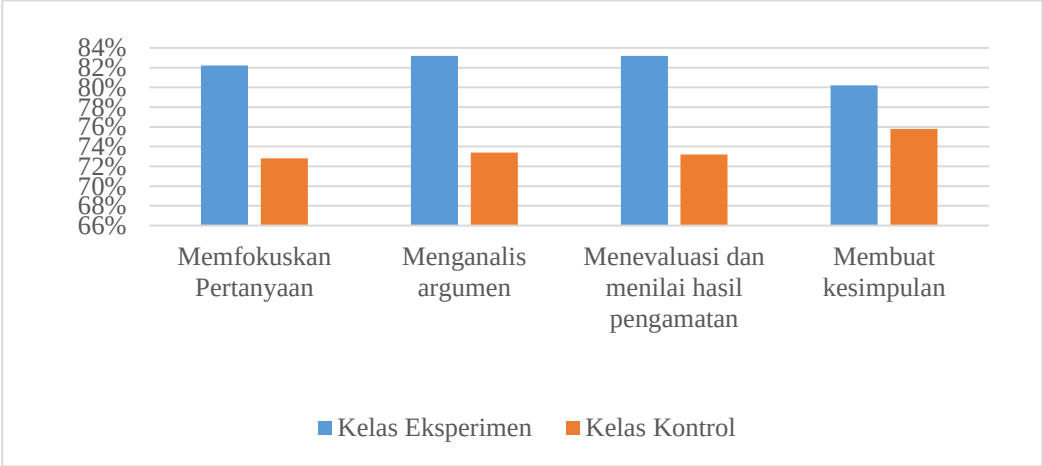
Graph 1. Regarding the Implementation of the Problem Based Learning Model Before and After Treatment

The graph explains that the experimental class before the treatment obtained an average of 83%, while after the treatment it obtained an average of 86%. This means that the treatment process of the problem-based learning model has an impact on students, as evidenced by the average after the treatment being higher than before the treatment.



Graph 2. About Students' Critical Thinking Skills Before Treatment

The graph shows that students use the discovery learning model for the control class. In the indicator of focusing on questions, the experimental class obtained an average of 79.2% while the control class obtained an average of 71%, in the indicator of analyzing arguments, the experimental class obtained an average of 79% while the control class obtained an average of 69%, the indicator of being able to evaluate and assess the results of observations, the experimental class obtained an average of 78% while the control class obtained an average of 72%, in the indicator of making conclusions, the experimental class obtained an average of 74%

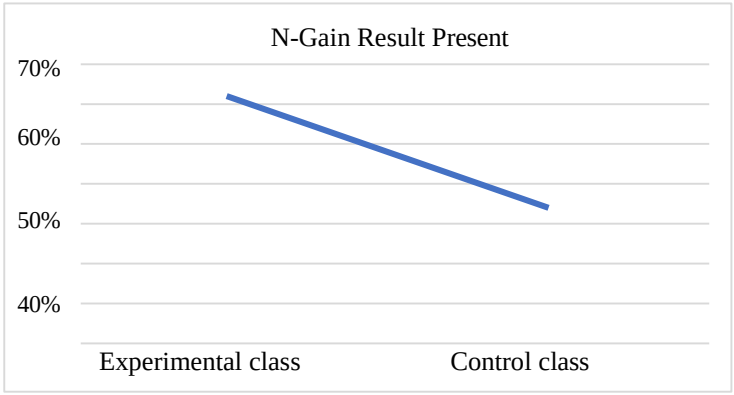


Graph 3. About Students' Critical Thinking Skills After Treatment

The graph explains that after the treatment of the problem based learning model for the experimental class and the discovery learning model for the control class. In the indicator of focusing on questions, the experimental class obtained an average of 82.2% while the control class obtained an average of 72.8%, in the indicator of analyzing arguments, the experimental class obtained an average of 83.2%. While the control class obtained an average of 73.4%, which shows that the observation results can be assessed, the experimental class obtained an average of 80% while the control class obtained an average of 75.8%, which is an experimental indicator for drawing conclusions. The experimental class obtained an average of 80% while the control class obtained an average of 73.2%.

Both graphs show that there is a difference in student responses to critical thinking skills in the material of working together and working together before and after treatment, students in the experimental class who applied the problem based learning model obtained higher scores compared to students in the control class who used conventional learning models. According to the opinion that explains the problem based learning model, one of the advantages is that it can develop students' ability to think critically and develop the ability to adapt to new knowledge.

In the aspect of critical thinking knowledge after the hypothesis test was conducted, an n-gain score test was conducted. The comparison of the n-gain present of the experimental class and the control class is as follows:



Graph 4. About Comparison of N-Gain Present in Experimental Class and Control Class

The graph explains the results of the n-gain present test for the experimental class of 62% included in the fairly effective category while the control class of 34% in the ineffective category. The effectiveness of using the Problem Based Learning learning model can be seen from the gain score value. The gain score in the experimental class has an average of 0.62 while in the control class it has an average of 0.34, meaning that the experimental class obtained a higher average than the control class. In addition, the comparison of the pretest and posttest results in the two classes is as follows:

Kelas	Pretest	Posttest	N-gain	Kategori
Eksperimen	77	91	0,63	Sedang
Kontrol	68	80	0,32	Kurang

Source: Research Data

The table explains that the experimental class obtained a higher average compared to the control class. The average pretest score of the experimental class was 74, while the pretest score of the control class was 68. The results of the posttest score of the experimental class showed an average score of 90 while the posttest score of the control class showed an average score of 80. In addition, the magnitude of the effectiveness of the problem-based learning model in forming critical thinking skills was 3.1, which according to (Tamur et al., 2020) is included in the high influence category.

This explanation proves that the problem-based learning model is effective in forming critical thinking skills in students. The learning model that can improve students' critical thinking skills is the problem-based learning model. Several factors that determine the success of the learning process and the achievement of learning objectives are one of which is determined by the existence of a learning model. From this explanation, it can be proven that the learning model is very influential in the learning process. Based on this explanation, it is proven by the data obtained in the experimental class using the problem-based learning model, the average score and average n-gain test results were higher than the control class.

Meanwhile, in the control class, students' critical thinking skills tended to be lower than in the experimental class. The control class itself used a learning model that made students less interested in observing the learning process. In addition, students were less enthusiastic about participating in the learning process, indicating low critical thinking skills in students. According to (Kiranadewi & Hardini, 2021), critical thinking skills in PPKn learning are still low, so a learning model is needed that can train critical thinking skills in students.

The problem based learning (PBL) learning model can be a solution to solve the problem of low critical thinking skills of students in PPKn learning, because this learning model can make the learning atmosphere more active, as evidenced by the enthusiasm of students in asking, answering, discussing and presenting discussion results and the problem based learning (PBL) learning model is effective in the learning process so that all students are involved and start from identifying problems, analyzing and assessing as a critical thinking process.

In this study, it can be seen that the problem based learning model is quite effective in developing students' critical thinking skills in the material on working together and working together at SMP Negeri 1 Padaherang. This is shown based on the results of the comparison between the experimental class and the control class, where the experimental class obtained an n-gain score of 0.62 and the control class obtained an n-gain score of 0.34, meaning that the experimental class obtained higher results compared to the control class.

4. CONCLUSIONS

The problem based learning model is effective in forming critical thinking skills in students. As shown by the results of the comparison between the experimental class and the control class. The experimental class obtained a higher n-gain test result of 0.62 and n-gain present of 62% included in the fairly effective category while the control class was 0.34 and n-gain present of 34% included in the ineffective category. In addition. The problem based learning model has a high influence in forming critical thinking skills in students, as can be seen from the results of the effect size of 2.61218. This study includes students and teachers. Therefore, teachers are advised to use the problem based learning model to form critical thinking skills in students.

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