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Improving Students' Critical Thinking Skills through Project-Based Learning Model for Grade V Students

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1. Abstract

This research is motivated by the low critical thinking skills of fifth grade students of SDN Kota Yogyakarta. This is shown based on the results of observations and interviews with fifth grade teachers of SDN Kota Yogyakarta. This study aims to describe the learning process using the project-based learning model and describe the improvement of critical thinking skills using the project-based learning model. This research is a type of classroom action research. This research was conducted in two cycles, each of which consisted of four stages, namely: (1) planning, (2) implementation, (3) observation, and (4) reflection. The research site was SDN Kota Yogyakarta, DI Yogyakarta, Indonesia. The subjects in this study were grade V students of SDN Kota Yogyakarta, totalling 26 students. The data collection techniques used were tests, observation, documentation, and field notes. Data analysis techniques used qualitative and quantitative data analysis techniques to determine the percentage of students' critical thinking skills in cycles I and II. The results showed that after applying the Project Based Learning model in class V, students' critical thinking skills increased. This is indicated by the increasing value of student completeness in the pre-cycle of 33.3% with less critical criteria, increasing in cycle I by 56.27% in fairly critical criteria and increasing again in cycle II which reached 86.3% with very critical criteria.

Keywords: *Critical Thinking, Project Based Learning.*

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2. Introduction

In the digital era with fierce competition like today, a teacher as the spearhead of education is required to be able to make students to have the ability to think critically and creatively. If students are not able to think critically, they will be left far behind and not develop. Therefore, teachers must be able to create learning that can hone children's ability to always think critically and creatively. Critical thinking ability is a thinking process with the aim of being able to make rational decisions in deciding a problem or case that occurs in social life.

Critical thinking ability according to Halpen in (Putri et al., 2017: 122) is empowering cognitive skills or strategies in determining goals. The process is passed after determining the goal, considering, and referring directly to the target. According to Greenstein (Fitri et al., 2018) that in the 21st century the critical thinking skills needed are critical thinking, creativity, and problem solving. According to Unaenah in Winarti (2022) Critical thinking is a skill in thinking by using the process of analysing and evaluating a problem so as to produce the right decision in solving the problem. Kustiah (2021) explains that critical thinking is one side of being a critical person where thoughts must be open, clear, and based on facts.

Based on observations in class VB of SDN Golo, it shows that when the teacher gives students the opportunity to ask about material they do not understand, students are silent and tend to be passive. As a result, learning becomes monotonous and students' critical thinking skills are low. Then during the explanation and at the end of learning, students are unable to make conclusions from the learning that is carried out. When asked for opinions by the teacher, students have not been able to give opinions. When the

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teacher asks questions, students cannot answer them.

This is supported by the results of the interview with the VB class teacher who said that during the learning process the teacher had provided a stimulus to students in the form of questions so that students would quickly accept learning. But in reality, the method given by the teacher did not work well. This indicates that students' critical thinking skills are still low.

Some of the criteria that indicate low critical thinking skills are that they cannot evaluate the actions/decisions taken, cannot explain the usefulness of information and the reasons for making decisions that have been made, and cannot find alternatives or other solutions in solving problems (Restiaji, 2021). One way teachers can improve students' critical thinking skills is by applying a learning model that is appropriate to the material being taught (Yusmanto, 2017).

There are various kinds of learning models that can improve students' critical thinking skills, one of which is a learning model that is in accordance with critical thinking skills, namely Project Based Learning (PjBL). According to (Fahrezi et al., 2020) Project-based learning model is a learning model that applies problems to be the first step in acquiring new knowledge based on the experience of concrete life activities. According to Natty (2019) the Project Based Learning learning model is a model of classroom activities that is different from usual. Daryanto (2014: 27) explains the steps of Project Based Learning, namely: 1) Determination of Fundamental Questions 2) Designing Project Planning 3) Developing a Schedule 4) Monitoring Learners and Project Progress 5) Testing results 6). Evaluating the Experience.

Some research similar to this research, including research conducted by Winarti, et

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al (2022) and Research from Kristiyanto's journal (2020) Both researchers focused on the learning process and student learning outcomes, the research was limited to student learning outcomes, not concerned with indicators of critical thinking. Therefore, in this study, through the application of project-based learning model, it is expected that students' critical thinking skills can increase, where students have the skills to ask questions, argue and discuss, make a conclusion and find alternatives or other solutions in solving a problem.

From the statement above, the project-based learning model is expected to improve students' critical thinking skills by increasing questioning skills, creativity, independence, sense of responsibility, self-confidence, and critical thinking skills. To implement it, planning is needed that is adjusted to the characteristics and background of students.

3. Methods

3.1. Participants and context

This research uses the type of Classroom Action Research conducted at SDN Golo, Umbulharjo District, Yogyakarta City, Yogyakarta Special Region Province. The subjects of this study were all VB class students totalling 26 students with a composition of 14 males and 12 females. This research was conducted in semester II / Even in the 2022/2023 school year. This classroom action research consists of two cycles, each cycle consists of two meetings. Each cycle consists of planning, action & observation, and reflection. Cycle termination is carried out if the research results are in accordance with the predetermined success indicators. While the focus of this research is the ability to think critically using the project-based learning model in class VB SDN Golo.

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3.2. Material

The research procedure was carried out in two cycles where each cycle consisted of two meetings, but if one cycle had not reached the target, it was continued with the next cycle. This PTK is a Classroom Action Research (PTK) model according to Kemmis and Mc Taggart which consists of four components, namely planning, acting, observing, reflecting. (Kemmis and MC, 1982: 8). The action research design used is the Kemmis & Mc Taggart model. This model consists of three stages, namely planning, action & observation, and reflection. Data collection techniques and instruments used in this study were observation with observation sheet instruments, test sheets, and documentation.

3.3. Data Collection and analysis

The data collection techniques used in this class action research are test techniques and non-test techniques (observation, documentation, field notes). The test technique according to Arifin (2013: 118) is a technique or method used in order to carry out measurement activities, in which there are various questions, statements, or a series of tasks that must be done or answered by students to measure aspects of student behaviour. Tests are used to measure critical thinking skills from student evaluation results. Observation according to Kunandar (2009:143) is an observation (data collection) activity to photograph how far the effect of action has reached the target. Observation, to observe student and teacher activities during learning by applying the project-based learning model in class VB in thematic learning. Documentation, according to Sugiyono (2015: 326) states that "documents are records of events that have passed". Documents can be in the form of writings, images, or monumental works of a person. Documentation in this study is in

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the form of photos and videos of learning as evidence of research. Field Notes in this study will be used to record unexpected events.

Data analysis is used to determine the level of student success after the teaching and learning process. This research uses quantitative data analysis and qualitative data analysis. Qualitative data analysis was used to analyse data in the form of descriptive text during learning by using project-based learning model in class VB. For quantitative data analysis in the form of analysis of observation results and evaluation test results. The following calculates the observation analysis of the learning process with the project-based learning model.

3.4. Ethical Considerations

The results of this reflection are used as material for planning learning in the next cycle. If the expected results have not been achieved, improvements will be made in cycle II until the indicators are achieved. This is done to find out the strengths and weaknesses observed in cycle I, namely learning by applying the project-based learning model and students' critical thinking skills.

3.5. Limitations to the Study

The limitation of the research conducted in class VB is that all students in class VB of SDN Golo have not participated due to other factors. The number of students who participated in the research in cycle I was 21 students out of 26 students, while in cycle II there were 24 students. So that the observation in the observation aspect was carried out classically. Another limitation was that the research was conducted when the time was

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approaching the end of the learning year so that the time was divided with other lessons.

4. Results and Discussion

The results of research that has been carried out in cycle I and cycle II with the aim of improving students' critical thinking skills by using the Project Based Learning model in class VB students of SDN Golo. This research was conducted starting from the pre-cycle and ending in cycle II. Each cycle in the learning process observes teacher activities, student activities, and conducts tests to measure students' critical thinking skills using the project-based learning model. According to Made Wena (2012: 144) explains that "Project Based Learning is a learning model that provides opportunities for teachers to manage learning in the classroom by involving project work". Project work contains complex tasks that require students to design, solve problems, make decisions, conduct investigations and provide opportunities for students to work independently.

Based on the results of observations made on teacher activities and student activities using the project-based learning model, it shows an increase in students' critical thinking skills in the pre-cycle of 44.45% in the pre-cycle to 66.27% in the first cycle. Then, in cycle II it increased again to 83.86%. The results of the observation of the implementation of the project-based learning model can be seen in the following table:

Table 1. Improvement of learning implementation results in pre-cycle, cycle I and II

No.	Action	Percentage	Category
1.	Pra Siklus	44,45%	Simply
2.	Siklus I	66,27%	Good
3.	Siklus II	83,86%	Very good

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Based on table 1, it can be seen that teacher and student activities have increased from pre-cycle, cycle I to cycle II with the application of the Project Based Learning learning model. In the pre-cycle from the percentage results, it got a sufficient category, then in cycle I teacher and student activities obtained a good category. However, this is still said to have not reached the predetermined success indicators. In cycle II, teacher and student activities increased to very good. This has increased so that in this cycle it has been achieved.

Based on the evaluation test results, the increase in students' critical thinking skills is indicated by the increase in student completeness scores in the pre-cycle of 33.3%, increasing in cycle I by 56.27% and increasing again in cycle II, reaching 86.3%. The following table shows the improvement of students' critical thinking skills through evaluation tests:

Table 2: Improvement of students' critical thinking skills

Table 2. Comparison of students' critical thinking skills completeness scores

No.	Action	Percentage	Category
1.	Pra Siklus	33,3%	Less Critical
2.	Siklus I	56,27%	Critical Enough
3.	Siklus II	86,3%	Very Critical

Based on table 2 regarding student test results, it is known to have increased from pre-cycle, cycle I, and cycle II. From the test results in the pre-cycle obtained a less critical category, this has not yet reached the predetermined success indicators. In cycle I, the results of the thinking ability test still did not experience achievement because it still did not reach the predetermined achievement indicators because the category obtained in this cycle was a fairly critical category, so it still needed improvement in cycle II. After making

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improvements in cycle II, student test results experienced a significant increase to a very critical category.

The results showed a significant increase in the application of the Project Based Learning model on students' critical thinking skills. The Project Based Learning model can be applied to improve students' critical thinking skills because in the learning model there are activities that train students to think. In line with the thinking process that continues to be trained, students are able to improve their critical thinking skills. With the application of the Project Based Learning model in improving critical thinking skills to help students in solving a problem they face. In the Project Based Learning learning process there are stages where students discuss each problem together. This research is similar to research conducted by Winarti (2022), that this research focuses on the project-based learning model and students' critical thinking skills, in this study from pre-cycle, to cycle II always experienced a significant increase so that the specified success indicators were achieved. Thus, it can be concluded that the application of the project-based learning model can improve students' critical thinking skills.

5. Conclusion

Based on the results of data analysis and discussion, the class action research that has been carried out shows that the project-based learning model can improve the critical thinking skills of students in class Vb SDN Golo. This can be proven from the results of observations of teacher and student activities during the learning process by applying the Project Based Learning model to thematic learning in class VB SDN Golo in the very good category. The increase in students' critical thinking skills is indicated by the increase in student completeness scores starting from pre-cycle, to cycle I, and increasing in cycle II.

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Thus, students' critical thinking skills are increasing after applying the project-based learning model in each cycle.

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