

ENHANCING CRITICAL THINKING SKILLS THROUGH PROJECT-BASED LEARNING IMAGE-ASSISTED IN ELEMENTARY SCHOOL

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Abstract

This research aims to improve students' critical thinking skills using the Project Basead Learning Model in social science learning in elementary schools. Project-based learning model directs students to complete it directly and places responsibility on students during the learning process by generating critical ideas. It is studied using classroom action research with two cycles, each consisting of two meetings with four stages. Continuous, namely planning, implementation, observation, and reflection. The data collected includes teacher activities, student activities, and data that can provide conclusions about critical thinking skills. The research results show that project-based learning can improve the critical thinking skills of fifth-grade students in elementary schools; this is proven by calculating the first cycle classical completeness score of 69%. Moreover, there was an increase of 27.59% to 97%. This success was supported by changes and improvements to the learning process following the reflection results in the previous cycle.

INTRODUCTION

Education is one way to improve human quality (Waseso, 2017), which is an encouragement for the survival of a pluralistic society according to the content of education and learning, especially in facing the 21st century, which emphasizes talent, cognitive, psychomotor, and practical as well as mastery of technology (Barrot, 2019; Bernhardt, 2015; Liang et al., 2022; Muhamad & Seng, 2022; Xu & Zhou, 2022). Likewise, it supports and encourages students to be socially skilled, communicative, collaborative, and contributive (Boholano, 2017; González-pérez & Ramírez-montoya, 2022).

Technological developments are so fast, especially after Covid 19, that it has encouraged changes in systems in various lifelines, including learning (Bos et al., 2022; Hämäläinen et al., 2021). As one of the learning demands of the 21st century, technology is an item that needs to be considered in managing quality learning (Bolibekova et al.,

2020; Liklikadze, 2023) with improved learning outcomes (Gluchmanova, 2021). One of the benefits of technology in learning is that it facilitates the development of critical thinking skills (Nussbaum et al., 2021); strengthens argumentation skills (Demircioglu et al., 2022); and et al. (Arabloo et al., 2022). Some weaknesses when critical thinking skills are not stimulated include difficulty in solving problems, adapting, and difficulty developing creativity (Asyhar, 2023; Farida, 2022; González-pérez & Ramírez-montoya, 2022; Nusarastraya, 2013).

There has been much research on critical thinking skills. The topics studied are also varied, including multidisciplinary project-based learning to increase critical thinking and collaborative skills (Trisdiono et al., 2019); Critical Thinking Development via Project-Based Learning (Wang, 2022); Teachers' Views on the Impact of Project-Based Learning on Improving Critical Thinking in Upper Basic Students (Issa & Khataibeh, 2021); The Effect of Project-Based Learning on Critical Thinking in a US History Class (Cash, 2017). In basic education, the themes often studied are Project Based Learning Model Learning Tools Development To Improve Primary School Students' Critical Thinking Abilities (Hartini, 2017). The search for the literature review above strengthens the researcher to choose a relatively popular theme with the fifth grade as the research object.

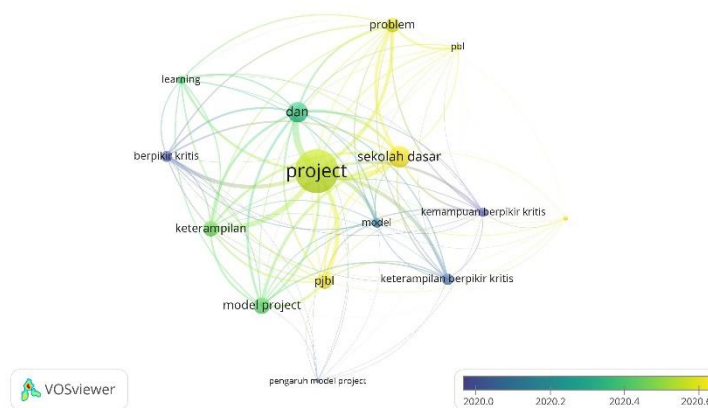


Figure 1. Vosviewer data analysis results

Figure 1 above shows that researchers have studied critical thinking skills. Project-based learning has a strong relationship with critical thinking, but it is still rare in some topics, especially the research focus in primary education. Likewise, regarding problems and their influence in elementary schools. This is the rational basis for why researchers are interested in conducting studies on this research. The data above is also supported by empirical information or observation data (OD-1) in class V at Elementary school

which states that there are still many students who feel nervous when answering teachers' questions, ask questions and do not dare to express opinions (OD1, 2023). Departing from these conditions, learning methods are needed to optimally involve students in the learning process, one of which is using the PjBL method.

The PjBL method involves students in direct learning. Project-based learning is a high intellectual level that guides students to determine concepts independently and helps students develop critical thinking (S. et al. et al., 2022; Samnidze, 2022; Zhao & Li, 2022). In addition, PjBL provides an exciting and meaningful learning experience, this is because students have different learning styles (K. Chen, 2023; Li & Pei, 2023; Wang, 2022). Likewise, PjBL provides space for exploration through collaborative experimentation (Miguel & Carney, 2022; Rupavijetra et al., 2022; Utami et al., 2020).

Based on this background, researchers are interested in conducting research titled "Application of the PjBL Model in Social Sciences Subjects to Improve the Critical Thinking Ability of Fifth Grade Students in Elementary Schools." This research aims to answer the question of how to improve critical thinking skills in elementary schools through the PjBL model.

LITERATURE REVIEW

PjBL in Elementary School

PjBL is a learning method that uses projects to implement learning activities. This learning model requires students to learn and produce work because this project-based learning method can generate learning motivation, and problem solving, and increase student cooperation in work groups in producing work (Saputro & Rayahub, 2020). The characteristics of PjBL are a) investigation within a set time, b) student direction, c) motivating critical thinking, d) reducing teacher control, e) commenting on colleagues and facilitators, f) working collaboratively, g) having management skills, h) connecting ideas with skills new, and g) performance appraisal (S. et al. et al., 2022; Maros et al., 2021).

The PjBL steps are carried out in the following stages: 1) determining the basis of questions, 2) designing the project, 3) making plans and projects, 4) paying attention to project progress, 5) assessing the project, and 6) project assessment (Nida Winarti et al.,

2022). The advantages of PjBL include asking, solving problems, being collaborative communicative, managing resources, organising projects, and obtaining information. The disadvantages are that it requires much time, money, and equipment, and the possibility that students are not active in learning (Mihic & Zavrski, 2017; Samnidze, 2022; Shpeizer, 2019). The PjBL stages go through the stages of describing the concept, determining the problem, studying the problem, determining the solution, planning the project, concluding, evaluating and reflecting (Abdelfattah et al., 2021; Sugihartini & Yudiana, 2018).

CT in Elementary School

Critical thinking is the desire to deeply examine a problem reaching one's experience (Fisher, 2009). Critical thinking is reasonable and speculative thinking that focuses on deciding what to believe or do (L. Huang et al., 2021). Strengthening critical thinking skills is internalised in learning issues to strengthen dispositions (Ennis, 2018).

There are three conditions needed to have critical thinking skills. These three requirements are 1) using deep thinking in solving problems with existing experience, 2) knowledge of methods with logical reasons, and 3) skilled in applying these methods. Effective mediators in developing critical thinking skills include (1) classroom interactions, including dialogue and questioning techniques; (2) the use of thinking language; and (3) story-based approaches (O'Reilly et al., 2022). The main points in formulating problems in critical thinking are 1) expressing existing facts, 2) choosing logical arguments, 3) detecting different points of view, and 4) concluding (Khasanah, 2022; Khasanah & Ayu, 2018).

METHODOLOGY

Research setting

This research uses classroom action research, which focuses on the fifth grade of elementary schools, where teachers and students are the research targets. In the implementation process, there are four stages that teachers go through, namely planning, implementation, observation and reflection. The instrument used is observation, which aims to analyse teacher and student activities. Next is a test, namely a series of questions

or exercises and other tools used to measure skills, knowledge, intelligence, abilities or talents possessed by individuals or groups.

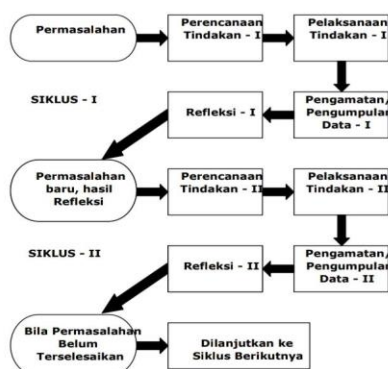


Figure 1. Classroom Action Research Cycle

Data analysis and reflection

Data analysis is a process of managing and interpreting data to place various information according to its function so that it has clear meaning, meaning and conclusions by the research objectives (Anas, 2019). Data analysis aims to find ways to improve students' critical thinking abilities. Data analysis in this research is qualitative descriptive data analysis, which is used to describe the application of the project-based learning model in improving critical thinking skills. The processed data includes teacher and student activities using the following formula:

$$P_s = \frac{\sum s}{n} \times 100$$

Noted:

PS = Observation of student or teacher activities

$\sum S$ = Number of scores observed

N = The total number of scores observed

The success rate with the criteria is excellent if it reaches a percentage of 86%-100%, good 76%-85%, quite good 60%-75%, not good 55%-59% and not very good ≥ 54 . As for the analysis of students' critical thinking data using the following formula:

$$P = \frac{m}{n} \times 100$$

Noted:

P = Presentation of students' critical thinking

M = The number of students' critical thinking test scores obtained

N = the maximum score on a student's critical thinking test.

Meanwhile, to calculate the presentation of each student's critical thinking indicator using the following formula:

$$Pi = \frac{s}{N} \times 100$$

Noted:

Pi = Presentation of indicators for understanding the first aspect

S = The total score of the first aspect of critical thinking indicators

N = The maximum score for the first aspect of critical thinking indicators

Next, calculate the average percentage of critical thinking in each indicator using the following formula:

$$Ri = \frac{Pm}{K} \times 100$$

Noted:

Ri = average critical thinking presentation first indicator

Pm = first aspect of critical thinking presentation

K = several times the first indicator is measured.

Indicators of success in students' critical thinking, if $\geq 80\%$ of students' critical thinking is in the sound and excellent categories. Students' critical thinking test results reached $\geq 80\%$. If observations of teacher activities and student activities are $\geq 80\%$, they are in the good and excellent categories. Students are said to be critical if their scores are in the 86%-100% category, critical 76%-85%, moderately critical 61%-75%, less critical 51%-60%, and $\geq 50\%$.

RESULT AND DISCUSSION

In fifth grade, classroom action research was carried out with 16 male and 7 female students. The lesson material is focused on National Events during the Colonial Period. The data observed was in the form of teacher student activities and critical thinking data

analysis, carried out in two cycles. The results of research and analysis for each cycle are as follows:

1. Data analysis for cycles 1 and II

Cycle one goes through the stages of planning, implementation, observation and reflection. At the planning stage, this is done by developing a learning implementation plan and preparing teacher and student activity instruments. Meanwhile, the learning implementation stage is carried out according to the material prepared according to the learning scenario. The learning stages refer to the introductory, content and closing activities.

Observed aspect	Cycle 1		Cycle 2	
	Meet 1	Meet 2	Meet 1	Meet 2
Preparation	2	3	3	3
A perception and motivation	2	3	3	3
Student regulation activity	2	2	3	3
Picture project 1 activity	3	2	2	3
Picture project 2 activity	1	3	2	2
Result and evaluation test	2	2	2	3
closing the lesson	3	3	3	3
Total	15	18	18	20
Percentage	71%	85%	85%	95%
Category	Active enough		Active	
Average	78%		90% (Very Active)	

Table 1. Results of observations of student activities

Observed aspect	Cycle 1		Cycle 2	
	Meet 1	Meet 2	Meet 1	Meet 2
Preparation	2	3	3	3
A perception and motivation	2	3	3	3
Student regulation activity	2	2	3	3
Picture project 1 activity	2	2	2	3
Picture project 2 activity	2	2	2	3
Result and evaluation test	2	2	2	2
closing the lesson	3	3	2	3
Total	15	17	17	20
Percentage	71%	80%	80%	95%

Category	Active enough	Active enough	Active enough	Active
Average	87,5%		90% (Very Active)	

Table 1. Results of observations of teacher activities

The results of the analysis of critical thinking skills in cycle one averaged 69% and increased in cycle two by 97%. Considerations in cycle one are essential to continue to cycle 2 because they have not met the classical completeness criteria, and fulfil the criteria after carrying out learning in cycle two by referring to the success criteria, namely $\geq 80\%$ of all students have reached the classical completeness criteria (KKM).

2. Reflection

Reflections on cycle I illustrate that at the first meeting, there were still shortcomings, namely that students were less active in explaining national images and events during the colonial period. However, at the second meeting, these deficiencies were reduced, the students were active, but not all students could explain the picture of the arrival of the colonial period. Furthermore, things that need to be improved include providing opportunities for students to explain pictures and play an active role in learning activities; in this case, teachers need to provoke students to express their opinions.

The reflection in cycle II informs that the learning process was carried out by the syntax and recommendations for improvement in cycle I. The teacher has corrected deficiencies in the learning process, such as encouraging students to express opinions, conveying their thoughts and concepts and stimulating students in solving various problems.

DISCUSSION

PjBL teaching methods can help students enhance their critical thinking skills (Mutakinati et al., 2018). According to Trisdiono, dkk (2019) reseach, improving critical thinking skills in elementary schools can be developed through collaboration (Trisdiono et al., 2019). PjBL attracts students' attention and provides more benefits for the students themselves (Wang, 2022). According to Sagala, one of the advantages of using PjBL learning is developing students in all skills. The skills developed with this learning are

not only in the field of knowledge but attitudes and skills in learning activities are considered (Sagala, 2017). To have a positive impact on students' daily living habits.

PjBL has broad benefits in learning. The project-based learning model can train creative thinking and collaboration, improve English language skills, and be challenging, so it is suitable for Translation classes (Astuti et al., 2021). PjBL positively perceives the multimodal platform (Sukiawati, 2020). With Project Based Learning (PjBL) learning can provide ample opportunities for students to play an active role and be involved in every activity and delivery of ideas (Chi, 2023; S. et al., 2021; Intel, 2007; Sathappan & Gurusamy, 2021). PjBL is a learning strategy that can help students have creative thinking, problem-solving and interaction and assist in investigations that lead to solving real problems. So with this learning, it is not only possible to improve student learning outcomes, but students' critical thinking is also formed (Jirana et al., 2020; Yusikah & Turdjai, 2021; Zakiah & Fajriadi, 2020). This critical thinking can be in the form of students' ideas or ideas formed in solving a problem (Kiong et al., 2022; Liang et al., 2022).

In line with the views and research findings above, critical thinking skills are different in initial conditions because in this learning, students are given more opportunities to develop their critical thinking. With the ideas and idea they have, they can learn to gain knowledge, as well as work together to solve a problem. The results of observations and research carried out at Elementary school on social studies subjects showed an increase in the critical thinking abilities of class V students in the initial conditions up to cycle II. An increase in students' critical thinking can be seen when they start planning learning using image projects. Each student was enthusiastic in expressing his opinion about the drawing project that was being planned. This shows that students are active in learning activities. At the beginning or the first meeting, students can explore knowledge by asking essential questions from the teacher.

The results of students' critical thinking are very different from the initial conditions because in this learning, students are given more opportunities to develop opinions and think critically. With their ideas and ideas, they can learn to gain knowledge and work together to solve a problem, such as expressing an opinion about a given drawing project. Students are more active in developing abilities and expanding knowledge by exchanging

ideas with their peers. The drawing project they explain can develop students' critical thinking and increase students' more realistic picture of national events during the colonial period. The results of classroom action research conducted by researchers, the percentage of critical thinking students in the first cycle who had a pretty good category was 69%; in the second cycle, it rose to 97% who had an outstanding category.

The results of this research align with the theory put forward by Hosnan that project-based learning is a learning strategy that uses projects or activities as learning tools to achieve competency in attitudes, knowledge and skills. Attitude competence is formed when group and individual activities, such as cooperation, self-confidence and accuracy in completing projects. The skills possessed by this learning are skills in applying work performance, stages of making work steps, and punctuality. Meanwhile, the knowledge competency is obtained from students' real experience when directly involved in creating a project. The results of increasing learning motivation can be seen from the pre-test, which shows that the average student learning outcome is 44, which shows that students' critical thinking level is very low. After taking action using the PjBL learning model in cycle I, the average score was 70.00, indicating a high level but not yet reaching the classical standard. In cycle II, the student's average score was 80 and experienced a significant increase, showing that the classical completeness criteria were achieved.

With PjBL, there are no longer passive students in learning activities. Because students are given equal opportunities and have their roles, the benefits obtained for teachers can provide insight into developing ways of learning so that students are given space to express ideas to improve students' critical thinking. It is no longer the teacher who plays an active role, but the teacher only provides services to students to be active and develop themselves to express their ideas. Moreover, the benefits for school principals can motivate teachers to carry out critical learning. So that student learning outcomes increase, and they have critical thinking in solving problems.

CONCLUSION

Image-assisted PjBL can improve students' critical thinking skills in elementary schools. Research results from cycle prove this I 69% and cycle II 96.55%. The research was carried out in two cycles with planning, implementation, observation and reflection

stages. In general, student learning outcomes classically and individually did not meet the criteria in cycle one; then improvements were made in cycle two. Some of the student and teacher activities that are not yet optimal are that the teacher's ability to encourage students' self-confidence is still meager, so it requires more optimal effort. These deficiencies become considerations for improvement to continue to cycle two and achieve adequate completion criteria.

RECOMMENDATIONS

There are several recommendations for future researchers that the image media used should be flash cards to avoid students from interpreting ambiguously. Apart from that, you can combine learning using image media.

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