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Application of the project based learning model to improve students' critical thinking skills in craft subject at SMP negeri 1 saling

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Abstract
21st century learning requires students to have a number of skills, one of which is critical thinking skills so that students are able to solve problems and make decisions. Teachers are required to be creative and innovative in implementing learning strategies to foster students' critical thinking skills, one of which is by implementing the Project based learning (PjBL) model. This research aims to: (1) Knowing the increase of students' critical thinking skills through the PjBL model in craft subject, namely artificial artificial soft material crafts at SMP Negeri 1 Saling and (2) knowing the aplication of PjBL model in craft subject namely artificial artificial soft material crafts at SMP Negeri 1 Saling. This research is a type of classroom action research. The subjects of this research were 33 students in class VII.4 for the 2023/2024 academic year who took craft subjects. The research results show: (1) the application of the PjBL learning model can improve students' critical thinking skills in craft subject namely soft materials crafts at SMP Negeri 1 Saling. The increase in students' critical thinking skills in cycle I to cycle II was 10% and in cycle II to cycle III the increase was 6%, (2) the application of the PjBL model in craft subject namely artificial artificial soft material crafts is good for application at SMP Negeri 1 Saling, because the application of the PjBL learning model can directly improve students' critical thinking skills.

Keywords: PjBL Learning, Critical Thinking Skills

Introduction

Education is a way of forming people to use their reason and thoughts as an answer to facing problems that arise in the future. Through education, it is hoped that this nation can keep up with developments in the fields of science and technology which are increasingly developing in the 21st century. Education in the 21st century aims to build students' intelligence abilities in learning so that they are able to solve problems around them, forming intelligence in the real world, not just knowing, but being able to solve problems faced in the environment in a meaningful, relevant and contextual way (Sonia R. 2022: 3) [6]. Regarding learning, the demands of the 21st century demand a change in the learning paradigm from teacher-centered to student-centered learning, changing from learning to memorize concepts to learning to discover and build concepts on your own, from classical individual learning to cooperative learning which does not only teach thinking skills. but also able to teach students other skills, so that they can develop the skills needed for themselves, society, nation and state.

Teachers have an important role in providing learning and developing education. A teacher bears a great responsibility in the educational process, because in providing knowledge to students it is necessary to create a learning atmosphere and learning process in which students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble morals, and skills. that is needed by himself, society, nation and state.

Teachers as those responsible for developing the teaching and learning process are expected to improve the quality of the teaching and learning process, not only trying to achieve learning outcomes, but also how to obtain the results or learning processes that occur in children. Teachers are required to be creative and innovative in implementing learning strategies to meet the demands that students have a number of skills from the 21st century era, namely creativity, independence in learning, and critical thinking skills so that students are able to solve problems and make decisions.

One of the ability expected in 21st century learning is critical thinking. Critical thinking is considered important for students to face life's challenges effectively in an increasingly complex world. Critical thinking needs to be habituated, trained gradually and continuously by conditioning students to find problems and find solutions to these problems. According to Nur (2011:17) [4], critical thinking is very important because critical thinking can grow students' ability to make rational decisions about what should be done. Critical thinking is the ability to think that uses the process of analysis and evaluation in a problem based on evidence and logical reasons so as to produce the right decision in solving the problem.

Critical thinking can be trained by exposing students to real problems and then looking for solutions to these problems so that students reach conclusions with correct concepts. Students who have critical thinking skills always want to know information to analyze and find solutions, so they can achieve understanding and goals in making decisions. Considering the importance of students having critical thinking skills, teachers are expected to be able to develop learning strategies that can provide learning experiences where students are trained to solve problems in real life through the learning process, so that students' critical thinking abilities grow.

Based on teaching experience and observations of researchers in craft subject activities, there are several problems that arise and are of concern to researchers, some of the problems include: teachers have developed various learning models, such as independent learning, groups and

assignments, but these methods have not been able to achieve learning objectives.

In the learning process, students' critical thinking skills have not been deliberately programmed. The teacher has tried to invite students to be actively involved in learning by inviting students to have question and answer discussions, but only a few students can provide answers and reasons for answering questions from the teacher. Students are less active in the learning process, resulting in less training of students in understanding, absorbing or responding to material and everyday problems, causing students' critical thinking skills to not be trained. Apart from that, students are still dependent on teachers as the main source of information, students are less likely to try to find information themselves, causing a lack of student involvement in learning, such as students not being brave enough to convey their opinions or ideas, less able to work together in groups and learning motivation is also still low, making skills their critical thinking is less than optimal.

Teachers need to implement a learning model that can stimulate students' thinking to be more active by presenting concrete or real problem situations in their daily lives, to increase students' understanding and involvement in the material being taught. One learning model that can answer the above problems is the project based learning (PjBL) model.

The PjBL model is a learning method that places students at the center of the learning process. This learning model uses problems as the first step in collecting and integrating new knowledge based on their experiences in real activities. PjBL allows students to be able to reflect on their own ideas and opinions, and make decisions that influence the outcome of the project and the learning process in general ends with presenting the final product.

The PjBL model provides opportunities for students to freely carry out experimental activities, study literature in the library, browse on the internet, and collaborate with teachers. Therefore, learning resources become more open and varied, including exploring the environment. In its implementation, this model provides ample opportunities for students to make decisions in choosing a topic, conducting research, and completing a particular project.

According to Wena (2010: 138) [8] learning using the PjBL model is learning that provides teachers with the opportunity to manage classroom learning by involving project work. Project work can be seen as a form of open-ended contextual activity based learning, and is part of the learning process which places a strong emphasis on problem solving as a collaborative effort, which is carried out in the learning process over a certain period. Sulaeman (2016: 5) [7] stated that PjBL learning is project-based learning, where students are given the task of developing themes/topics in learning by carrying out realistic project activities.

According to John Thomas (in Hosnan, 2014: 321) [2] PjBL is learning that requires complex tasks, based on challenging questions/problems, which involves students in designing, solving problems, making decisions, or investigative activities, giving students the opportunity to work collaboratively. independently over a period and culminate in a realistic product or presentation.

Based on the opinions above, it can be concluded that the PjBL model is an innovative learning that focuses on students learning knowledge by solving their own problems and honing skills that produce real work or projects. These projects encourage abilities in cognitive and psychomotor aspects and determining their own goals and can increase cooperation in groups and students can organize their own activities in completing the project.

The PjBL model is one option to encourage the growth of students' critical thinking in the learning process. This learning model can improve students' thinking power, students are required to be able to think critically because they actively participate in creating solutions to the experiences they experience. The application of this model is also an answer to the challenges of learning in the 21st century and helps students to develop long-term learning skills.

The PjBL model is effective for learning because it can encourage creativity, independence and critical thinking in student learning. This is proven by research that has been carried out previously. The first research was conducted by Dewi Insyasiska, Siti Zubaidah and Herawati Susilo (2017) [3], the results of this research showed that PjBL could influence critical thinking skills to increase by 34%.

This paper discusses the application of the project based learning (PjBL) model to improve students' critical thinking skills in craft subject at SMP Negeri 1 Saling.

Method

This research was carried out at SMP Negeri 1 Saling. The research time is in the even semester of the 2023/2024 academic year which is adjusted to the schedule of teaching and learning activities in craft subject. Data collection will be carried out for two and a half months, from January to March 2024, in each cycle with four meetings, using cycle I, cycle II and cycle III. The subjects of this research were 33 students in grade VII.4 for the 2023/2024 academic year, consisting of 19 male students and 14 female students with different abilities.

The aim of this research is to: (1) knowing the increase of students' critical thinking skills through the PjBL model in craft subject, namely artificial artificial soft material crafts at SMP Negeri 1 Saling and (2) Knowing the aplication of PjBL model in craft subject namely artificial artificial soft material crafts at SMP Negeri 1 Saling.

This type of research is classroom action research which aims to measure the increase in students' critical thinking skills using the PjBL model. Classroom action research is divided into four stages, namely planning, action, observe, and reflect.

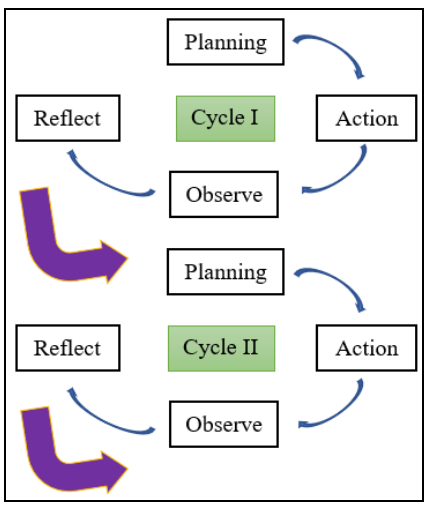

Fig 1: Classroom Action Research Cycle Model

The actions in this research consist of the pre-cycle stage and the research implementation stage. The pre-cycle stage is the stage before starting the cycle in classroom action research. Meanwhile, the research implementation stage consists of cycle I and cycle II.

Data collection techniques use observation, questionnaires and documentation techniques. Observations are used to obtain data on collaboration or cooperation between students in groups. This research documentation includes the syllabus, student attendance list, modules, and photos of learning process activities. The research instrument used was an observation sheet of students' critical thinking skills.

After all the data was collected, several analyzes were carried out, including analysis of observations of teacher and student activities, then calculating the average score of teacher and student activities using the formula (Arikunto, 1019:13):

Average presentation = $\frac{Jn \quad ns}{S \quad M} x\ 100\%$

Description of the average score

90%-100% = very good
80%-90% = good
70%-80% = pretty good
0%-70% = not good

To assess students' critical thinking abilities in solving problems, can use the following levels:

Less creative = (1)
Quite creative = (2)
Creative = (3)
Very creative = (4)

Result

Pre Cycle

In the pre-cycle activities, observations were carried out with the aim of finding out the problems that teachers usually face when learning in class. Observation results show that some students still pay little attention to the learning process, some students are less active in listening to the teacher and are even busy playing and they are less interested in learning. It was also found that students were less agile in solving problems in learning, indicating that students' critical thinking abilities were still low so they needed to get attention by changing the learning model with project based learning. Before conducting the research, a review of basic competencies was carried out according to the syllabus for craft subjects in the even semester, so that the material that would be taught using the project based learning model was artificial artificial artificial soft material crafts.

Cycle I

At the planning stage, activities were carried out to create teaching modules according to the learning outcomes of craft subjects, namely soft-made material crafts. Prepare research instruments, namely observation sheets for students' critical thinking skills. Apart from that, it also prepares a list of group names and documentation tools.

The implementation phase of cycle I is on Tuesday, January 9 – 23 2024 in grade VII.4 of SMP Negeri 1 Saling. Implementation of actions in accordance with the planned learning plan.

The results at the observation stage show that students' critical thinking has not reached the indicators of success as evidenced by the average critical thinking ability score of 75%.

Table 1: Percentage of Critical Thinking Skills Observations of Cycle I.

No	Indicator	Percentage (%)
1.	Focusing questions	73
2.	Ask and answer questions	75
3.	Consider whether the source is trustworthy or not	66
4.	Observe and consider observation reports	75
5.	Create and determine the results of considerations	75
6.	Determining an action	87
7.	Interact with other people	73
	Average	**75**

The average value of students' critical thinking skills of cycle I was 75%. In general, in cycle I, some students didn't have the critical thinking skills in the learning process. The indicator "considering whether the source is trustworthy or not", students still have not achieved the expected success indicators.

Reflection of cycle I, students were less able to process the sub-matter given. So the improvement plan for cycle I is if the teacher provides explanations and questions, students ask questions and refute if there is a statement that refutes it.

Cycle II

The planning stage was carried out based on cycle I reflection. At this stage, teaching modules were created in accordance with the learning outcomes of craft subjects, namely soft-made material crafts. Prepare research instruments in the form of observation sheets for students' creativity, independence and critical thinking abilities. Apart from that, it also prepares a list of group names and documentation tools.

The implementation phase of cycle II class actions was held on Tuesday, January 30 – February 13 2024 in grade VII.4 of SMP Negeri 1 Saling. Implementation of actions in accordance with the planned learning plan.

H The results at the observation stage show that students' critical thinking has not yet reached the indicators of success as evidenced by the average critical thinking ability score of 85%.

Table 2: Percentage of Critical Thinking Skills Observations of Cycle II.

No	Indicator	Percentage (%)
1.	Focusing questions	**78**
2.	Ask and answer questions	89
3.	Consider whether the source is trustworthy or not	85
4.	Observe and consider observation reports	81
5.	Create and determine the results of considerations	90
6.	Determining an action	88
7.	Interact with other people	83
	Average	**85**

The average value of critical thinking skills of cycle II students is 85%. In general, some students already have critical thinking skills in the learning process. Several indicators of students' critical thinking skills have reached the expected indicators of success.

Reflection of cycle II, Some students have not been able to find a way out of the problems given because they are

embarrassed to ask questions, as evidenced by the results of observations there are still indicators of critical thinking skills whose percentage value is <80%, therefore it is necessary to carry out cycle III with the note: Implementation of action The Visiting the Problem stage in cycle III was changed, where the teacher was active in visiting each group asking about the difficulties they were facing. The teacher also provides paper if you want to ask a written question, so that students dare to ask.

Cycle III

The planning stage was carried out to ensure that there is an increase in cycle II and cycle III, so that it is true that there is an increase due to the implementation of project based learning. Create teaching modules according to the learning outcomes of craft subjects, namely artificial soft material crafts. The learning media used are learning modules. Prepare research instruments, namely observation sheets of students' critical thinking skills. Apart from that, it also prepares a list of group names and documentation tools.

The class action implementation stage in cycle III was held on Tuesday, February 20 – March 5 2024 in grade VII.4 of SMP Negeri 1 Saling. Implementation of actions in accordance with the planned learning plan.

The results of the observation stage show that students' critical thinking skills are in line with the indicators of success as evidenced by the average score for critical thinking skills of 91%.

Table 3: Percentage of Critical Thinking Skills Observations of Cycle III.

No	Indicator	Percentage (%)
1.	Focusing questions	90
2.	Ask and answer questions	92
3.	Consider whether the source is trustworthy or not	90
4.	Observe and consider observation reports	88
5.	Create and determine the results of considerations	94
6.	Determining an action	92
7.	Interact with other people	91
Average		**91**

The average value of critical thinking skills of cycle III students is 91%. In general, some students already have critical thinking skills in the learning process. Indicators of student independence have reached the expected indicators of success.

Reflection of cycle III, indicators of students' critical thinking skills are optimal. These results prove that the project based learning model can improve critical thinking skills in craft subjects, artificial soft material craft.

Discussion

Implementing the Project Based Learning (PjBL) Model Can Improve Students' Critical Thinking Skills

In implementing the project based learning model, the average percentage of critical thinking skills of cycle I was 75%. From the results of the reflection, improvements were made for cycle II. The average percentage of critical thinking skills of cycle II was 85%. Then proceed to cycle III to prove that there has been an increase in critical thinking skills due to the application of the project based learning model. The average percentage of critical thinking skills of cycle III is 91%.

Table 4: Observation Results of Critical Thinking Skills from Each Aspect of each cycle

No	Indicator	Percentage (%)		
		Cycle I	Cycle II	Cycle III
1.	Focusing questions	73	78	90
2.	Ask and answer questions	75	89	92
3.	Consider whether the source is trustworthy or not	66	85	90
4.	Observe and consider observation reports	75	81	88
5.	Create and determine the results of considerations	75	90	94
6.	Determining an action	87	88	92
7.	Interact with other people	73	83	91
Average		**75**	**85**	**91**

The average indicator for focusing questions of cycle I was 73%. In cycle II it increased to 78%. Then in cycle III it increased again to 90%. The average indicator for ask and answe questions of cycle I was 75%, increased to 89% in cycle II, then increased again to 92% in cycle III. The average indicator for considering whether the source is trustworthy or not of cycle I was 66%, increased to 85% in cycle II, then increased again to 90% in cycle III.

The average indicator for observe and consider observation reports of cycle I was 75%, increased to 81% in cycle II, then increased again to 88% in cycle III. The average indicator for create and determining the results of considerations of cycle I was 75%, increased to 90% in cycle II, then increased again to 94% in cycle III.

The average indicator determining an action of cycle I was 87%, increased to 88% in cycle II, then increased again to 92% in cycle III. The average indicator for interact with other people of cycle I was 73%, increased to 83% in cycle II, then increased again to 91% in cycle III.

The average percentage increase students' critical thinking skills from cycle I to cycle II was 10%, while from cycle II to cycle III it increased by 6%. In cycle III, the average percentage of critical thinking skills obtained had reached the expected success criteria. Students of cycle III have begun to adapt to the learning model used, students are also used to discussing and exchanging information with their group members.

Application of the Project Based Learning (PjBL) Model in the Handicraft Subject of Artificial Artificial soft material crafts at SMP Negeri 1 Saling

In implementing the project based learning (PjBL) model in the crafts subject, namely artificial soft material craft at SMP Negeri 1 Saling, in each cycle it can be seen that from cycle I to cycle III there was always an increase. Results of literature study research on several articles on craft learning in junior high schools using the project based learning (PjBL) model. Several studies show that the project based learning (PjBL) model can be applied well in specialist learning in junior high schools.

Research conducted by Altaftazani *et al*. (2020) [1] that the project based learning model is quite well applied for learning to make works of art. Based on the responses of teachers interviewed, the PjBL model requires students to produce a certain product. An example is making sculptures from soap. Then from the students' responses, students felt happy with the application of the PjBL model in learning to make sculptures because they could produce certain products. Apart from that, students are also able to find new ideas to carve the best possible statues.

In line with research conducted by Wayba *et al*. (2018) which shows that the project based learning (PjBL) model has a good effect on craft learning, namely making works of art. In the experimental class the PjBL model was used in making sculptures, while in the control class the direct learning model was used. This proves that the results of learning to make works from student-made soft materials using the project-based learning model are better than using direct learning.

Based on research conducted by Setiawan & Wahyuningtyas (2019) [5], it shows that the application of the PjBL model has a significant difference in influence on student activities and learning outcomes in craft learning for teaching materials for making handicrafts from leaf bones. This can be proven through the results of the control class gain index of 0.399 (Medium), and the experimental class gain index of 0.701 (High). The learning activity of experimental class students is much higher than that of the control class.

This research is also strengthened by Wirawan (2021) showing that the Project Based Learning model can improve the quality and learning outcomes of students' crafts. This is proven by the research results, namely the teacher skill score in cycle I was 43 (good), 60 in cycle II (good), and 69 in cycle III (very good). The total student activity score in cycle I was 16 (good), 24 in cycle II (good), and 28 in cycle III (very good). The percentage of completeness of student learning outcomes was 64.29% in cycle I, 82.14% in cycle II, and 100% in cycle III.

Based on some of the literature above, it can be concluded that the project based learning model is good to be applied at SMP Negeri 1 Saling, specifically in craft subjects, namely artificial soft material crafts, because the application of the project based learning (PjBL) model can directly improve students' critical thinking abilities.

Conclusion

From the results of data processing and discussion, it can be concluded that: (1) The application of the project based learning (PjBL) model can improve students' critical thinking skills in craft learning, namely artificial soft material crafts at SMP Negeri 1 Saling. This is based on observation data from all indicators that have been determined to get results in cycle I was 75%, increased to 85% in cycle II, and increased to 91% in cycle III. The increase of students' critical thinking skills from cycle I to cycle II was 10% and increased from cycle II to cycle III was 6%, (2) The application of the project based learning (PjBL) model in the craft subject, namely artificial soft material crafts, is good for application to SMP Negeri 1 Saling, in the craft subject, namely artificial soft material crafts because the application of the project based learning (PjBL) model can be done directly. improve students' critical thinking skills.

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