Implementation of Design Thinking Learning Model to Improve Critical Thinking in Pancasila and Civic Education Subjects Students at SMP Negeri 4 Banda Aceh

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Abstract. Critical thinking can be interpreted as a skill that students must have in this 21st-century era. This study aimed to test the effectiveness of the design thinking learning model to improve the ability of SMP Negeri 4 Banda Aceh students in critical thinking. This research uses a quantitative approach with a type of experimental research. The population in this study is all grade VII students of SMP Negeri 4 Banda Aceh. The sample in this study was 32 students of grade VII-1 as an experimental class and 31 students of grade VII-2 as a control class, with a total of 63 students. In sample selection, purposive sampling techniques are used. In this study, instruments were used as tests consisting of pre-test and post-test. The data analysis was carried out using the independent sample t-test technique. The research results proved that class VII-1, an experimental class applying the design thinking learning model, showed better learning outcomes than the control class, which only used conventional learning methods.

Keywords: Critical Thinking, Design Thinking, Learning Model, Learners, PPKn.

1 Introduction

To prepare a competent generation in the present, education aims to transfer knowledge and prepare students to face the demands of the globalization era. There are three skills that learners must master. These skills include thinking critically, creatively, and problem-solving (1). Critical thinking ability also called critical thinking, is included in the components needed to form excellent and intelligent citizens. Critical thinking is also one of the abilities students must have in facing an increasingly global life. Critical thinking is thinking that is reasonable, reflective, and carried out systematically on all information or problems obtained so that they can make the right decisions (2). According to Susanti and Risnanosanti (3), critical thinking in students is still relatively low to meet every crucial thinking indicator, especially in the hands of analysis, evaluation, and inference analysis, which are still very low where students must be able to analyze the material and understand the material well.

This condition occurs due to the lack of optimal concepts that are awakened in students and their tendency to make decisions without conducting adequate analysis and evaluation. Critical thinking indicators that have not been honed in students are the ability to connect and integrate information, express reasonable and quality ideas, and respond to arguments. This low ability arises because the previous learning process adopted a passive approach, where students only act as recipients of teacher explanations. In addition, students are also less trained to concentrate their minds and conclude their own opinions. This can be seen from the OECD 2019, which

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states that the PISA results in 2018, Indonesia's position is ranked 7th from the bottom (4). The results of the data presentation by PISA show that students can solve problems that require critical thinking skills, which is still very low.

A potential method to improve one's critical thinking skills is to expose students to computational thinking concepts. This involves using problem-solving techniques to break down complex problems into simpler components (5). Research conducted by Pusparatri (6) shows that learning strategies carried out by educators can significantly affect students' critical thinking skills. This indicates that choosing the correct teaching method is integral to improving the ability to think critically. So many teaching models are available, each with unique benefits. Kurniasih (7) argues that individuals with critical thinking skills can evaluate problems, identify appropriate, logical, and practical solutions, and quickly apply those solutions in real-world scenarios. Therefore, every student must have good critical thinking skills. Critical thinking is an aspect of higher-order thinking Skills (HOTS) when individuals face complex problems requiring in-depth analysis. Learning methods focusing on HOTS must be applied and integrated into the learning process to increase student readiness to meet the challenges of the Industrial Revolution 4.0 era toward Society 5.0. Thus, students are expected to be able to improve their ability to think critically and be ready to face future challenges.

Education in the 21st century emphasizes the development of creativity and innovative skills (8). To achieve this goal, students must integrate knowledge at all levels and develop training that develops problem-solving, critical, and creative thinking skills. These traits can be acquired through practice, and students are taught to explore, question, discover, and solve problems early (9). When a child is encouraged to develop critical thinking skills, he will tend to evaluate, judge, and learn things that require in-depth analysis. Pancasila and Civic Education (PPKn) is one of the subjects that has an essential role in producing quality and good citizens. PPKn is not just a field of study but plays an active role in educating citizens and their societal role. Civic Education (Civics) aims to encourage the active participation of civil society in constitutional democracy (10). Preparing the younger generation is as essential as injecting prosperity into the future because the younger generation is a reflection of the end and requires special attention. Without adequate preparation, the younger generation will become apathetic, selfish, and unaware of its rights and responsibilities as citizens.

Educators, especially teachers, must be able to develop learning strategies that can improve students' critical thinking skills in finding information independently. In addition, teachers must also be able to create cognitive structures in students to learn actively and effectively (11). To improve students' ability to think critically, there are several stages to optimize its application. This stage includes interactive learning, where students are treated as active thinkers and not just as objects to be taught. In addition, teachers act as mediators, facilitators, and motivators who help students to learn, not just teach. The purpose of this study was to analyze students' skills in critical thinking. The role of teachers is significant in designing appropriate learning accompanied by improving students' skills in thinking critically. Therefore, this research can significantly contribute to education development in Indonesia.

Actions that educators can take to improve students' ability to think critically are to apply design thinking in the learning process. Design thinking, as a mode of creative thinking, is involved in learning environments as a new approach to the design process. This approach emphasizes the end user as the focus of problem-solving. Design thinking is a systematic approach to generating ideas, solving problems, and encouraging innovation. The design thinking approach in the learning process is a way of thinking and strategies to improve collaboration and problem-solving skills. The design process involves identifying challenges, gathering information, developing ideas, and testing solutions. By creating learning projects designed by teachers, the design thinking method can be applied flexibly to students and all subjects, resulting in an

innovative learning process. Related design thinking techniques have been used as a suitable tool to teach the ability to think critically as one of the most important skills (12). Design thinking is included in the stages for a solution-based approach to solving various problems and enhancing the ability of creative, critical, and innovative individuals (13). This problem-solving approach is user-centric. The stages of design thinking consist of five stages: highlight, prototype, ideate, test, and define. This method can be applied in various fields and scientific fields. Based on Riti's previous research (14), the project-based learning model using the design thinking method has proven feasible and practical. In addition, this learning model is recognized as effective in achieving and developing students' critical thinking ability. The difference between this study and previous research is that this study aims to see the results of applying design thinking in Pancasila and Civic Education subjects. In contrast, design thinking was previously only limited to science subjects.

Based on these various descriptions, it can be concluded that learning Pancasila and Civic Education (PPKn) emphasizes knowledge rather than skills. This can lead to reduced students' critical thinking skills. This is evidenced by the results of a 2018 study conducted by the Programme for International Student Assessment (PISA), which shows that the ability of Indonesian students to think critically is still very low. In addition, PPKn learning is still stuck on conventional learning methods that are not student-centred. Therefore, researchers are interested in further researching the influence of the design thinking learning model on PPKn subjects in improving critical thinking skills at SMP Negeri 4 Banda Aceh.

2 Literature Review

2.1 Learning Model

In education, the term "learning model" refers to a form of learning presented typically by teachers from beginning to end. The word "model" itself can be interpreted in various ways, for example, as a guideline for carrying out a particular activity, a system that systematically describes an object or event, a simplified design of a working system, or a reduced representation used to convey a movement that is like its original form (15). According to Aunurrahman (16), the learning model includes "all learning activities designed and implemented by teachers which must lead to the occurrence of student learning processes." It is important to note that the application of the learning model must be adjusted to the learning specifications and teaching materials used. As a result, an active learning process that can achieve learning in the cognitive realm of students will be performed. Students will quickly understand the material taught without any obstacles in education. Thus, these learning activities can run effectively and efficiently.

2.1 Design Thinking

Design Thinking is a method used in overcoming problems, designing solutions, and shaping issues. In addition to being used to solve problems, this method is also used to develop and shape problems. In its application, Design Thinking focuses on humans. Each stage in Design Thinking is based on and intended for human interests (17). As an innovation process, design thinking focuses on understanding end users' needs in detail. The goal is to know the problem and develop an effective solution (18,19). The value of design thinking and its theoretical foundation stems from the importance of one's experience and perception. The framework's design emphasizes phenomenological aspects in a collaborative approach to problem identification and solving.

2.3 Critical Thinking

One of the activities by manipulating and changing information in memory is called thinking. We think of forming concepts, considerations, critical thinking, making decisions, thinking creatively, and solving problems. According to Susan and Anthony (20), healthy critical thinking and reflective thinking (focusing on deciding what to believe and what to do) are essential. Critical thinking has many definitions. Facione (21) also states that a person who thinks critically is a person who can self-regulate when making decisions to interpret, analyze, evaluate, and reason, as well as the ability to use evidence, concepts, methodologies, standards, or situational considerations to formulate a basis for decision making. Ennis (22) adds that critical thinking is the ability to think reflectively and focus only on something that is believed or done. In critical thinking, of course, there are basic clarification skills, reasoning, decision-making principles, estimation and integration, providing a further explanation, and other abilities.

2.4 Design Thinking Theory

Design thinking theory solves problems and develops innovative ideas through certain stages. This approach has begun to be applied in learning and teaching to develop creativity and innovation abilities in students. According to Brown and Katz (23), design thinking consists of five stages: empathize, define, ideate, prototype, and test. This approach solves complex problems by developing innovative and targeted solutions. In the context of learning, Design Thinking can be used to develop creativity and innovation abilities in students. Nelson and Stolterman (24) also suggest that the design thinking approach can help teachers and learners solve complex problems by profoundly understanding users and developing innovative solutions. This approach can be applied in learning to develop learners' critical and creative thinking skills. In design thinking, education not only creates products but also creates designs by prioritizing three central values: first, many eyes, namely collaborating various expertise to achieve planned goals; second, Customer View Point, namely researchers as designers must be able to respond and understand students to the problems experienced during the learning process, and third, tangibility, the manufacture of prototypes by designers to test whether the prototype that has been designed can answer the problems experienced during learning if it can solve the issues then the prototype is considered perfect (25).

3 Method

3.1 Research Design

The approach used in this study is quantitative with the type of experimental research. This study used a classic experimental design design using a control group and an experimental group. The research design is presented in table 1:

Table 1. Clasical Experimental Design

R	O1	X	O2
	O3		O4

Information:
O1 = Pre-test data of the treatment group
O2 = Post-test data of the treatment group
O3 = control group
O4 = Control Group

3.2 Population and Sample

This study's population consisted of all SMP Negeri 4 Banda Aceh grade VII students. Quoting from (26), research sampling in class VII people using Purposive sampling techniques, a sampling method carried out by considering certain factors. The reason for selecting samples using purposive sampling techniques is that not all examples have criteria according to what the author determines; from this technique, researchers concluded that class VII-1, as many as 32 people acted as an experimental class, and class VII-2, as many as 31 people, namely working as a control class.

3.3 Research Instruments

The instrument used pre-test and post-test is a test of students' critical thinking skills in a multiple-choice test containing 20 HOTS questions. The question was developed from the grid of teaching materials for Pancasila and Civic Education class VII on the "Daerah Dalam Kerangka NKRI. " The results of the item analysis are shown in table 2:

Table 2. Item Analysis Results

Number	r-calculate	Information
1	0,439	Good discrimination power
2	0,676	Good discrimination power
3	0,430	Good discrimination power
4	0,552	Good discrimination power
5	0,582	Good discrimination power
6	0,464	Good discrimination power
7	0,582	Good discrimination power
8	0,722	Good discrimination power
9	0,629	Good discrimination power
10	0,709	Good discrimination power
11	0,745	Good discrimination power
12	0,792	Good discrimination power
13	0,606	Good discrimination power
14	0,386	Good discrimination power
15	0,838	Good discrimination power
16	0,673	Good discrimination power
17	0,503	Good discrimination power
18	0,704	Good discrimination power
19	0,494	Good discrimination power
20	0,466	Good discrimination power

Table 2 shows that all items have good discrimination power. The reliability test results show $\alpha = 0.908$, meaning that this instrument has high reliability.

3.4 Data Analysis Techniques

The normality test was performed with IBM SPSS Statistic 26 software. The basis for making this test decision is if the value of Sig. ≥ 0.05 data is declared normal, but if the value of Sig. < value of 0.05 data is declared abnormal. In contrast, the homogeneity test in this study used IBM SPSS statistic 26. If the value of Sig. ≥ 0.05, the data can be expressed as homogeneous data. However, if the Sig value < 0.05, the data can be described as inhomogeneous.
The test used the help of IBM SPSS Statistic 26 for the difference test. The t-test is carried out at the level of freedom α = 0.05 (5%) with test criteria if the value of Sig. (2-tailed) > 0.05, then it is stated that Ho is accepted and Ha is rejected. Conversely, if the value of Sig. (2-tailed) ≤ 0.05, then it is indicated that Ho is rejected and Ha is accepted.

4 Result

The results of the normality test, homogeneity test and t-test before treatment are presented in Table 3:

Table 3. Normality Test, Homogeneity Test And T Test Before Treatment

Class	Average Pre-test	Normality Test	Homogeneity Test	T-test
Experiment	34.8	(Normal) 0,200	Homogeneous 0.333	Insignificant 0.000
Control	35,9	(Normal) 0,061		

The results showed that the data were ordinary, homogeneous, and insignificant. Data analysis using a t-test proved that the value of Sig. (2-tailed) ≥ 0.05. These results showed that the ability of students (before being treated) in the experimental class with the control class was the same. Furthermore, the results of the normality test, homogeneity test and t-test after the experiment are presented in Table 4:

Table 4. Normality Test, Homogeneity Test And T Test after Treatment

Class	Post-test *Average*	Normality Test	Homogeneity Test	T-test
Experiment	77,9	(Normal) 0.200	Homogeneous 0.826	Insignificant 0,000
Control	62,8	(Normal) 0,108		

The results of data analysis show that the data is usually distributed and homogeneous. The results of the independent sample t-test test on the experimental class post-test data and the control class post-test obtained sig values. 2 (tailed) < 0.005, then H0 is rejected, and Ha is accepted, meaning that there is a significant difference between the results of the experimental class post-test and the control class post-test. Thus, the ability of students (before being given treatment) in the practical class with the control class was different. Based on the research results conducted on the control and experimental groups, data on students' critical thinking skills are shown in Figure 1.

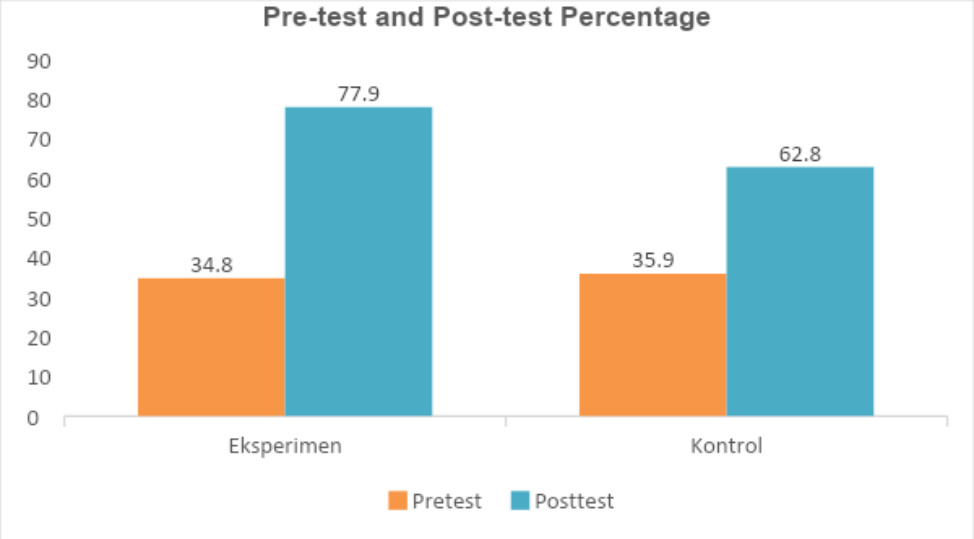

Figure 1. Average Scores of Experimental Class and Control Class

Based on the picture, can be concluded that there are differences on average's percentage among experiment group and control group. That is, the increase in the average score on the critical thinking ability of experimental class students after applying the design thinking learning model increased.

5 Discussion

Based on the research results, the average pre-test score of students' academic achievement in the control class was 35.9, and in the experimental class was 34.8. Meanwhile, the average post-test score of students' academic achievement in the control class was 62.8, and in the practical course was 77.9. The academic performance of both types improved significantly, with the control group increasing by 26.9 and the experimental group increasing by 43.1. From this, it can be concluded that both the experimental and control groups experienced a significant increase between the pre-test and post-test with design thinking learning models and conventional learning methods. To test student learning outcomes with substantial differences between students who use the design thinking learning model and traditional learning methods, the independent sample t-test is used. The results of this test showed that significance values were obtained at 0.00 < 0.05, so Ho was rejected, and Ha was accepted. Thus, experimental

classes that use the design thinking learning model have better learning outcomes than control classes that only use conventional learning methods (27).

This study's findings align with previous research conducted by Riti (14), which showed the feasibility and practicality of a project-based learning model that integrates design thinking methodology. This integration has also been proven to improve students' ability to think critically. In addition, Pratama (28) found that applying the design thinking method led to the development of a high-fidelity prototype for Japanese language learning media that was successfully tested and provided satisfactory results. This research places significant emphasis on preparing learning devices, ensuring they are student-oriented and student-centred to improve meaningful learning outcomes after completing the learning process. Applying the design thinking learning model in the experimental class is the factor that causes the difference in student learning influence between the design thinking learning model (practical course) and traditional learning methods (control class). This model helps students achieve learning goals effectively and efficiently to learn proactively and independently without relying on teachers. In addition, with the application of the design thinking learning model, students can discuss, work together, actively participate, and solve problems related to learning materials, increasing student learning independence. This shows that design thinking is very effective for improving student learning outcomes and can also foster students' thinking skills.

6 Conclusion

Based on the research results, the research findings show that by using the design thinking learning model in Civics subjects, students can obtain higher learning outcomes compared to the application of traditional learning methods. The statistical analysis results also show a significant difference between these two groups; namely, the design thinking learning model has a positive effect on increasing the ability of grade VII students of SMP Negeri 4 Banda Aceh to think critically. Therefore, the research and data analysis results show that the design thinking learning model is very relevant and effective for improving critical thinking skills in SMP Negeri 4 Banda Aceh. The implication is that applying the design thinking learning model in PPKn learning can help students gain a better and deeper understanding of concepts and issues related to the region in the context of a unitary state. Thus, this study makes an essential contribution to strengthening the evidence that the design thinking learning model has significant benefits in achieving and developing students' critical thinking skills, especially in PPKn subjects. These findings underscore the importance of using innovative and active learning approaches, such as design thinking, to enrich the learning experience of students and improve students' critical thinking skills.

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