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The effect of make-a-match cooperative model on elementary school civic lecturers reviewed from students' critical and democratic thinking

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#### Abstract

This research aimed to determine the effect of critical and democratic thinking abilities on students using the 'make-amatch' learning model and those using the lecture model. The research sample was ninety-four students of the elementary school teacher education program classes. The research employed questionnaires and interviews as its primary research instruments. Based on the research results, there is evidence that the treatment (experiment) significantly affected the critical and democratic thinking skills of students who were given the treatment. Furthermore, the results of the paired t-test and comparison of the post-test scores of students who took part in the research using the make-amatch learning model were a score of 89.48, compared to the lecture/text learning model, with a score of 66.89. In conclusion, the make-a-match learning model affects the critical and democratic thinking abilities of prospective elementary school teacher students.

#### Keywords

Critical thinking, democratic, make-a-match, elementary school teacher education program students

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## Introduction

Colleges or universities allow students to improve their abilities /competencies, especially technological literacy. This is necessary for students to have a creative and critical attitude when filtering various information with technological advances. Besides, critical and creative thinking abilities are 21<sup>st</sup> century abilities that students must have to become superior individuals and survive increasingly fierce competition (Rahmawati et al., 2020; Rahmawati, 2020; Septikasari & Frasandy, 2018). This is proven based on empirical conditions in elementary school teacher education program students in Universitas Negeri Yogyakarta, who found that critical thinking abilities were still minimal in understanding elementary school civics subjects, as well as based on the analysis of quiz scores taken at the end of the lecture and the process of presenting material that was not yet complete and up to date according to journals and scientific articles (Farah & Patang, 2023; Mustika, 2023).

Additionally, from the discussion process, it was also found that the class tended to be monotonous in discussing civic lecture subjects in elementary schools, even though the aim of civic learning should improve high-level thinking, rationality, and innovation in responding to these problems. The current hot citizenship issue is democracy. Based on the results of unstructured student interviews, students have difficulty understanding interesting discussions and studying civic subjects that contain much theory, which tends to make students bored, fed up, and pay less attention to the learning process because they consider civic subjects quite dull, with group discussions and presentations in general. Regarding the quality of learning, especially critical thinking abilities, which can affect students' democratic attitudes (Magdalena et al., 2020). It was found that critical abilities affect the spirit of society and democracy. Furthermore, previous research shows that critical thinking abilities help students solve problems in tests (Angela et al., 2017; Anggraeni, 2020; Yuliastrin et al., 2023).

This is the basis for researchers to improve critical thinking abilities towards democratic prospective teachers to improve the quality of student learning through the make-a-match model. This technique encourages students to actively seek answers with their group mates, increasing enthusiasm and involvement in learning. Thus, student learning outcomes can be positively affected. In addition, this technique involves receiving material from the teacher and encourages discussion and collaboration between students (Ari & Wibawa, 2019; Wijendra, 2020).

## Literature Review

Facione and Gittens (2015) explained that critical thinking abilities can help students reflect on the current situation, analyze causes and effects, and find solutions. In basic civics subjects, students' questions focus more on problem-solving than memorizing texts (Ernawati et al., 2015). Students can interpret elementary school civics subjects through reflection, find relationships with social phenomena, and draw conclusions. One innovation that can be done is to vary the suitable models for students and deepen students' critical and democratic analytical thinking abilities in civic education courses through the make-a-match cooperative model. Students can engage and exchange ideas with peers in a collaborative make-a-match

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collaborative model, assisted by audio, visual, and audiovisual media (Munirah et al., 2020; Rani, 2021).

| Carpini and Keeter (1996) summarized several definitions/indicators of democratic attitudes.  | Facione and Gittens (2015) stated six indicators of critical thinking abilities.  |  |  |
|---|---|--|--|
| <ol> <li>Students have a friendly attitude.</li> <li>Students have an attitude of tolerance.</li> <li>Students have the ability to think critically in terms of attitude or behavior.</li> <li>Students have the ability to be responsive to things around them.</li> <li>Students have the ability to solve problems both for themselves and the environment.</li> <li>Students have the ability to respect other people's suggestions or ideas, even if they conflict with the ideas the student has.</li> <li>Students have the ability to convey ideas validly and coherently.</li> </ol> | <ol> <li>Students can identify/formulate questions.</li> <li>Able to find clear answers to every question.</li> <li>Accept suggestions from others to develop<br/>new ideas.</li> <li>Students can argue differently from their<br/>friends.</li> <li>Students can analyze a problem.</li> <li>Students can express their opinions in front of<br/>the class.</li> <li>Able to express opinions clearly and<br/>systematically.</li> <li>Able to face challenges with a strong<br/>foundation.</li> <li>Identify the reasons stated. Students have a<br/>friendly attitude.</li> <li>Look for connections between<br/>problems/experiences.</li> <li>Identify conclusions.</li> </ol> |  |  |
|   |   |  |  |

Table 1. Indicators of democratic attitudes and critical thinking abilities

#### Methodology

#### Research design, site, and participants

This research uses experimental research to determine the effect of model treatment on students' critical and democratic thinking abilities. The method used in experimental research is with a treatment group (model application) and a control group (without strategy application). According to Creswell (2013), experimental research is a research strategy that seeks to determine whether treatment affects research results.

Through the methods given to the class before and after treatment, is there an influence of the cooperative make-a-match model on students' critical and democratic thinking abilities? The research is carried out at elementary school teacher education program in Universitas Negeri Yogyakarta. The sample in this research was two people from elementary school teacher education program classes F and E, even semester, Universitas Negeri Yogyakarta, with a population is 86 students.

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Table 2. The sample of the research

| Class                     | (    | Number of |          |
|---------------------------|------|-----------|----------|
|                           | Male | Female    | students |
| elementary school teacher | 7    | 41        | 48       |
| education program F 2022  |      |           |          |
| elementary school teacher | 4    | 42        | 46       |
| education program E 2022  |      |           |          |

Source: elementary school teacher education program of universitas negeri yogyakarta student data

This research uses total sampling because the population is less than 100. The samples of this research are elementary school teacher education program F 2022 students (experimental class) and elementary school teacher education program E 2022 students (control class), with a treatment design like the previous model. In addition, the experimental group received treatment with the make-a-match cooperative model in elementary school civic lectures.

## Data collection and analysis

Data was collected using a structured questionnaire to assess students' needs related to the make-a-match model through offline learning in democratic critical thinking. The questionnaire consisted of 20 statements categorized into 11 factors: learning objectives, topic needs, teaching material requirements, assessment needs, make-a-match syntax needs, support system needs, and accompanying learning impact needs. Quantitative data from the questionnaires were analyzed using descriptive statistics to summarize each questionnaire's frequency and percentage of responses. The research flow is described as follows:



Figure 1. Research flow

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## Findings

This research used an experimental method with a non-equivalent control design. The make-a-match learning model is used in the experimental class, and the class still uses the lecture method, or there is no different treatment from normal learning. Furthermore, the research results were obtained by observing student activities and tests.

## Observation results of student activities

The activities that occur in each student's learning activities were recorded during the study. Student activities were obtained from observation sheets or elements of each learning process of teaching meetings used to determine changes in student attitudes toward learning activities. The presentation of observations of the learning process is shown in the following table.

| No | Indicator aspects  | Experimental class |         | С | ontrol cla | ISS |   |
|----|--|--------------------|---------|---|------------|-----|---|
|    | -  | -                  | Meeting |   | Meeting    |     |   |
|    | -  | 1                  | 2       | 3 | 1          | 2   | 3 |
| 1  | Students have a friendly attitude  | 3                  | 3       | 4 | 3          | 3   | 4 |
| 2  | Students have an attitude of tolerance   | 3                  | 3       | 4 | 3          | 3   | 4 |
| 3  | Students have the ability to think critically in terms of attitude or behavior   | 3                  | 3       | 4 | 2          | 2   | 3 |
| 4  | Students have the ability to be responsive to things around them   | 3                  | 3       | 4 | 2          | 3   | 3 |
| 5  | Students have the ability to solve<br>problems both for themselves and the<br>environment  | 2                  | 3       | 3 | 2          | 3   | 3 |
| 6  | Students have the ability to respect<br>other people's suggestions or ideas even<br>if they conflict with the ideas the<br>student has | 2                  | 3       | 4 | 2          | 2   | 2 |
| 7  | Students have the ability to convey ideas validly and coherently.  | 2                  | 3       | 4 | 2          | 3   | 3 |

| Table 3. Analysis | of democratic | attitudes in | the experimental | and control | classes of | elementary | school i | teacher |
|-------------------|---------------|--------------|------------------|-------------|------------|------------|----------|---------|
| education         | program       |              |                  |             |            |            |          |         |

Note: 4 = Democratic, 3 = Fairly Democratic, 2 = Need for guidance

The analysis of meetings 1-3 showed that the learning atmosphere of basic civics was based on a cooperative model, making competition more democratic. The opposite can be seen in the learning atmosphere in the experimental and control classes. In the experimental class, creating a democratic learning atmosphere experienced a relatively high increase, namely the fulfillment of six indicators of a democratic learning atmosphere. This is progress that is considered very good in the elementary civics course.

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| NT  | т 1' ,  |       | • • 1              | 1    |         | $C \rightarrow 1.1$ |      |
|-----|---|-------|--------------------|------|---------|---------------------|------|
| No. | Indicator aspects                                   | Expe  | Experimental class |      |         | Control cla         | ISS  |
|     |   |       | Meeting            |      | Meeting |                     |      |
|     |   | 1     | 2                  | 3    | 1       | 2                   | 3    |
| 1   | Students can identify/formulate questions           | 33    | 36                 | 42   | 25      | 24                  | 27   |
| 2   | Able to find clear answers to every question        | 30    | 34                 | 30   | 25      | 26                  | 27   |
| 3   | Accept suggestions from others to develop new ideas | 40    | 40                 | 42   | 34      | 33                  | 32   |
| 4   | Students can argue differently from their friends   | 36    | 47                 | 38   | 34      | 35                  | 37   |
| 5   | Students can analyze a problem                      | 36    | 38                 | 43   | 34      | 38                  | 34   |
| 6   | Students can express their opinions in              | 43    | 45                 | 47   | 23      | 27                  | 34   |
|     | front of the class                                  |       |                    |      |         |                     |      |
| 7   | Able to express opinions clearly and systematically | 35    | 44                 | 48   | 34      | 39                  | 40   |
| 8   | Able to provide real examples                       | 33    | 43                 | 36   | 43      | 44                  | 34   |
| 9   | Able to face challenges with a strong               | 30    | 46                 | 40   | 38      | 35                  | 36   |
| 10  | Identify the reasons stated                         | 34    | 47                 | 46   | 35      | 37                  | 38   |
| 11  | Look for connections between                        | 42    | 46                 | 46   | 38      | 42                  | 44   |
|     | problems/experiences                                |       |                    |      |         |                     |      |
| 12  | Identify conclusions                                | 47    | 46                 | 44   | 38      | 44                  | 42   |
|     | Score obtained                                      | 439   | 512                | 502  | 401     | 424                 | 425  |
|     | Average value                                       | 36.5  | 42.6               | 42.3 | 33.4    | 35.3                | 35.4 |
|     | Percentage  | 77.4% | 90%                | 88%  | 71%     | 75%                 | 75%  |

Table 4. Analysis of critical thinking in experimental and control classes

Figure 2. Comparison graph of student learning activities



The results above explain that the score in the experimental class was 484 while the control class was 416. With an average score of 40.4 and a percentage of 88% and 34.7 with a percentage of 75

%, the conclusion is that experimental class students did more activities than control class students. This shows that there is a fairly good comparison between the treatment groups.

## Analysis of results in descriptive statistics

Descriptive analysis of experimental and control classes leads to the acquisition of student scores obtained after conducting a pre-test, treatment, or post-test. Referring to the result, the pre-test score for the experimental class was 45.75, while the average post-test score was 89.48. The score achieved by students from the lowest pre-test score was 21, and the highest score was 67, with a range of 46. The lowest post-test score was 75, and the highest score was 100, with a range of 25. The pre-test standard deviation was 12.740, while the post-test standard deviation was 6.182.

Meanwhile, the average pre-test score for the control class was 43.17, while the average post-test score was 66.89. The value achieved by students with the lowest pre-test score was 21, and the highest score was 58, with a range of 37. The lowest post-test score was 50, and the highest score was 83, with a range of 33. The standard deviation score of the pre-test was 9.900, while the standard deviation of the post-test was 7.908. The important information from the experimental class obtained better learning outcomes than students in the control class.

### Results of inferential; statistical analysis

Inferential statistical analysis involves testing prerequisites before data analysis, including normality, homogeneity, and hypothesis tests. The normality test is used to evaluate whether the research data is normally distributed, assuming that sig is more than 0.05 indicates a normal distribution, and vice versa, if sig is less than 0.05, which indicates an abnormal distribution.

|           |                           | Kolmog     | gorov-Sn | hirnov a | Sh         | apiro-W | ilk   |
|-----------|---------------------------|------------|----------|----------|------------|---------|-------|
|           | Class                     | Statistics | Df       | sign     | Statistics | Df      | Sign. |
| Students' | Pre-test of               | .113       | 48       | .159     | .956       | 48      | .070  |
| learning  | experimental class        |            |          |          |            |         |       |
| outcomes  | Post-test of              | .137       | 48       | .024     | .949       | 48      | .056  |
|           | experimental class        |            |          |          |            |         |       |
|           | Pre-test of control class | .103       | 46       | .200 *   | .956       | 46      | .080  |
|           | Post-test of control      | .125       | 46       | .069     | .968       | 46      | .241  |
|           | class                     |            |          |          |            |         |       |

## Table 5. Normality test for experimental and control class

\*. This is the lower limit from its true meaning.

a. Correct Significance of Lilliefors

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The SPSS output results in Table 5 test the normality of the data in the research have Sig 0.056 > 0.05, while the control post-test class data has a Sig of 0.241 > 0.05. Therefore, the experimental class post-test and control research data are normally distributed. A homogeneity test on the control and experimental classes of the research was done using SPSS version 25 to determine whether the population variance was the same. Data must be homogeneous if sig is greater than 0.05 and not if sig is lower than 0.05.

## Table 6. Homogeneity test

|                  |  | Levene Statistics | df1 | df2     | Sign. |
|------------------|--|-------------------|-----|---------|-------|
| Student learning | Based on average                           | 8.552             | 3   | 184     | 0.58  |
| outcomes         | Based on median                            | 8.226             | 3   | 184     | 0.55  |
|                  | Based on median score and with adjusted df | 8.226             | 3   | 151.269 | 0.58  |
|                  | Based on trimmed mean                      | 8.470             | 3   | 184     | .013  |

Through the output results of Table 6, in the data homogeneity test, it was found that the variance of the post-test results of experimental and control classes was the same or homogeneous, with the significance of the base on the average of more than 0.058 greater than 0.05. Therefore, the research data has the same or homogeneous variance.

## Testing the hypothesis

The make-a-match cooperative learning model affects students' critical and democratic thinking abilities, according to the paired t-test hypothesis. The data was processed with SPSS version 25, and the important output results were determined as follows.

- H0 = There is no effect of the make-a-match learning model on the critical and democratic thinking abilities of elementary school teacher education program Universitas Negeri Yogyakarta students.
- H1 = There is an effect of the make-a-match learning model on the critical and democratic thinking abilities of elementary school teacher education program Universitas Negeri Yogyakarta students.

The conclusion of this research explains that it is stated as significant if t-count > t-table at a significance level of 5% and the p-value < 0.05. The pre-test and post-test in the experimental and control classes are shown in the table below.

|        |  | Ν  | Correlation | sign. |  |
|--------|--|----|-------------|-------|--|
| Pair 1 | Pre-test and post-test in experimental class | 48 | .188        | .000  |  |
| Pair 2 | Pre-test and post-test in the control class  | 46 | .600        | .000  |  |

## Table 7. Pair sample correlation

Thus, H0 is rejected, and H1 is accepted because 0.00 < 0.05. In conclusion, the learning model applied with a make-a-match impacts the critical and democratic thinking abilities of students in elementary school teacher education program of Universitas Negeri Yogyakarta students.

### Discussion

This research was conducted in the elementary school teacher education program of Universitas Negeri Yogyakarta, with a population of 60 students, using total sampling. The two classes in research design were divided into experimental and control classes, and a quasiexperimental design control class with different control class group designs. Class F has 48 students in the experimental class, and Class E has 46 students in the control class. The experimental class is a class that uses the make-a-match learning model, while the control class is a class that applies to the model in general. This research was conducted three times in the experimental class and three times in the control class. After that, the post-test was given. The first and second meetings in the experimental class began with a pre-test, and the make-amatch learning model was used for treatment. Meeting 3 continued the lecture process, and a post-test was carried out. Meetings 1 and 2 in the control class began with the provision of a pre-test and then continued with conventional lectures; meeting 3 continued with the learning process, and then a post-test was carried out. Before treatment was given, the researcher conducted a pre-test at the initial meeting. At the end of the meeting, a post-test was administrated to obtain student learning outcomes data. Therefore, the results of introductory civic lectures in mastering the concepts, theories, and principles of the curriculum, with the treatment of different models, are better than the learning results using the previous model.

The descriptive statistical data above shows increased student learning outcomes based on curriculum principles in elementary school civics courses. The increased post-test results data indicate a significant difference in learning outcomes. The results of observations of students who study using make-a-match show that students' enthusiasm for learning increases with the treatment or application of make-a-match. The class conditions in the learning process are also democratic and fun because, with the implementation of make-a-match, students can play while learning and connect the material in class to what happens in their daily environment. Students become more democratic and enthusiastic about learning and improving their critical thinking abilities.

The researchers conducted inferential statistical analysis, testing the normality of student learning data in elementary school civics learning in experimental and control classes that ran normally. Homogeneity test of post-test learning outcomes in treatment and before treatment of the model with the same or homogeneous results. Furthermore, a hypothesis test was carried out. In this case, the t-paired sample correlations test with SPSS output results of 0.00 < 0.05, the result. Creating a pair significantly affects the critical and democratic thinking abilities of students in elementary school teacher education program Universitas Negeri Yogyakarta. It is also the result of Nurani (2018). Applying this model will certainly increase student activity in the discussion process, allowing them to dare to express opinions, provide good input and suggestions, and respect the opinions of all students.

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In addition, in this research, the researchers summarized several factors that differentiate the needs of the treatment model from previous models. The first factor is that this learning invites students to learn democratically. As with research from Sariyyah and Abdullah (2023), make-a-match makes learning more active, especially for prospective teacher students, because they are invited to express opinions and debate in a friendly manner. It is also the same as Khofiyah (2020) found that changes in student learning outcomes from the make-a-match cooperative learning model, with the help of PowerPoint and groups that follow conventional learning, are caused by game elements in learning.

The second factor is that lectures in class attract more students to attend. Priatmoko and Dzakiyyah (2020) and Situmorang et al. (2021) also stated that learning activities were still focused on teaching staff before the make-a-match type of cooperative learning model. However, after implementing the make-a-match cooperative learning model in the experimental class, the learning process became more interesting and less boring compared to the control class with the conventional learning model. The make-a-match type of cooperative learning model helps students be more able to voice their opinions, be enthusiastic, play an active role and be cheerful in the learning process.

According to Saragih et al. (2022), a fun learning process means that students no longer come in and out during learning and no longer feel bored or stressed when following the learning process in class, bored or stressed-motivated to follow the learning and feel happy to increase students' interest in learning basic civics.

The third factor is collaboration between students and lecturers. According to Ari and Wibawa (2019), the make-a-match learning method has several advantages, including collaboration between fellow students, which can also be realized dynamically, and the emergence of dynamics. Cooperation is evenly distributed among all students. According to Situmorang et al. (2021), students also become more active and confident in helping their friends if they encounter difficulties and ask the lecturer for clarification if they do not understand. Susanto and Untari (2022) also stated that some teaching results using the make-a-match model are more enthusiastic in facing the learning process.

When cooperative learning models such as make-a-match are used, students are trained to master the material quickly, communicate, and collaborate well. For example, when a lecturer gives questions or answer cards to students. Students will also remember the material listed on the card to remember it when they do the next assignment.

The fourth factor is increasing student enthusiasm, student interaction in class with lecturers, and interactions with fellow students. This is also the same as Liana (2016), which makes students more enthusiastic and energetic and motivates students to learn. This research was conducted to allow students to exchange opinions using the make-a-match learning model during the learning process. Students can better analyze, express, and evaluate during learning. This can be seen in everyone being enthusiastic and always eager to learn. Trihandayani et al. (2023) showed that the make-a-match method can improve students' critical thinking abilities and interactions with lecturers and fellow students.

The fifth factor is providing opportunities for students to share opinions or ideas. In addition, Sidabutar (2024) and Putri and Salimi (2016) also stated that the thinking abilities of international relations students are more significant because the make-a-match type cooperative learning model provides opportunities for students to express their opinions or

ideas. Students' knowledge will increase with the contribution of students' thoughts when creating questions and answering/providing other answers, as well as guidance from researchers.

### **Conclusion and Recommendations**

The researchers conclude the results of the make-a-match learning study in the elementary school civics lecture process that affects the critical and democratic thinking abilities of students in elementary school teacher education program Universitas Negeri Yogyakarta. In the t-test analysis, namely the post-test scores for the experimental and control classes, the Sig value (2-tailed) was obtained at 0.00 < 0.05 so that it can be concluded that H0 is rejected and H1 is accepted.

This means that there is an influence of the make-a-match learning model on students' critical and democratic thinking abilities. Based on findings related to research results on the application of the make-a-match learning model to the critical and democratic thinking abilities of elementary school teacher education program Universitas Negeri Yogyakarta students, the suggestions are as follows.

- 1. For teaching staff, make-a-match learning is chosen as a learning model that can be applied in class to improve critical thinking abilities and student enthusiasm in class.
- 2. Education providers can provide mediation for developing teacher competence through activities and education at both macro and micro levels.

For readers/researchers of social and civic education, research or findings found by researchers can be used as a basis for decision-making to improve students' democratic abilities.

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