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THE EFFECT OF THE FLIPPED CLASSROOM LEARNING MODEL ON STUDENTS' CRITICAL THINKING SKILL IN ECONOMICS SUBJECT

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ABSTRACT

This study aims to determine the effect of the flipped classroom learning model on the critical thinking skills of State Senior High School 3 Sragen students. In conducting the research, the researchers used an experimental method (one-group pretest-posttest design). The sampling method was conducted by using a random sampling simple technique and was participated by 36 students. In analysing the data, SPSS version 21 was used to examine the significance of the differences in the results of the pre-test and post-test data. Based on descriptive analysis, the result shows: (a) the average critical thinking skill of students before using the flipped classroom learning model was 44.60 (sufficient category) and after using the flipped classroom learning model was 82.12 (very good category). Furthermore, based on inferential statistics using the paired sample t-test, the results of Sig. (2-tailed) = 0.000 < 0.05. In conclusion, using the flipped classroom learning model affects the critical thinking skills of State Senior High School 3 Sragen students.

KEYWORDS: Flipped Classroom, Students' Critical Thinking Skill

INTRODUCTION

Recent learning science in the 21st century requires students to have 4C's of learning skills, namely Communication, Collaboration, Critical Thinking, Problem Solving, Creativity, and Innovation (Dwyer, Hogan, & Stewart, 2014). Based on this goal, one of the challenges facing 21st century education is teaching students to think critically (Dekker, 2020; Caceres, Nussbaum, & Ortiz, 2018; Tang, Vezzani, & Eriksson, 2020).

However, Indonesian students critical thinking skills are currently relatively low. The Low critical thinking ability of students can be seen in the PISA 2018 (Program International Student Assessment) survey result that showed Indonesia 72nd ranked out of 78 participating countries (OECD, 2019). The low ranking of Indonesian students in PISA is due to the type of questions tested in PISA from level 1 to level 6, while most Indonesian students are only used to working on level 1 and level 2 questions. The survey results are low, indicating that the students Indonesia have low critical thinking skills. The low level of students' critical thinking skills should be solved immediately because it can

affect to students. They will be less developed in learning and everyday life (Rachmayani, 2014). indicators of the causes of low critical thinking skills of students. Among others, the causes are learning models and and media used by teachers do not support developing critical thinking skills (Damanik & Bukit, 2013). The process of selecting the right learning model and media will affect the expected output, in this case, the ability to think critically.

The observation results at State Senior High School 3 Sragen show that In economics subjects, students' critical thinking skills are still low. The student's in solving High Order Thinking Skills (HOTS) questions is only about 25%, as proven by the PAS average score of 46.3 with a KKM score of 75. The following table of student data

Table 1. Students' Critical Thinking Data

No.	Class	Mean Score
1	X IPS 1	45
2	X IPS 2	40
3	XI IPS 1	50
4	XI IPS 3	47
5	XII IPS 2	52
6	XII IPS 3	44
Mean		46,3

Another problem is that the lecturing method still dominates in economics learning activities where students only accept the learning materials provided by the teacher without any exploration, so students become passive. Moreover, the teacher has not used innovative media. This learning process causes students' critical thinking skills are not developed properly. Therefore, the learning process in schools needs to be fixed to be able to form students' critical thinking.

Learning models that can empower critical thinking are models that can stimulate higher order critical thinking and problem solving abilities by involving to participate students learning process activities and using technology that keeps up the times to support the learning process (Ismail, Harun, Zakaria, & Salleh, 2018). A flipped classroom is a learning model that is proven to be able to develop student's critical thinking skills (Ariyanto, Lestari, Hasanah, Rahmah, & Purwanto, 2020; Herzon, Budijanto, & Utomo, 2018; Sinprakob & Songkram, 2015; Zainuddin, Budijanto, & Amirudin, 2016). The flipped classroom model uses a student-centered learning approach based on constructivism theory where students build their knowledge by processing concepts they have previously understood to process and understand new information (Nursalim, Satiningsih, Hariastuti, Safira, & Budiani, 2016:62).

The concept of the flipped classroom model is that students learn the material at home through learning resources that have been provided by the teacher (usually in the form of learning videos) so that learning in the class can be focused on discussion activities and problem-solving (Capone, De Caterina,

& Mazza, 2017). By doing group discussion activities, it is expected that students can develop their critical thinking by exchanging their thoughts and opinions and then learn from each other among group members. The flipped classroom model also makes students actively involved in learning (Subramaniam & Muniandy, 2019) and allows them to create independent learning that helps them to reduce their cognitive load when solving problems given by the teacher in class (Tawfik & Lilly, 2015).

In cognitive load theory proposed by John Sweller (1980), it stated that new information received by humans must be processed by working memory before it can be stored in long-term memory (Anmarkrud, Andresen, & Bråten, 2019). Working memory is also known as short-term memory. Humans can only store new information in working memory for a certain period. The flipped classroom model provides learning resources which are generally in the form of learning videos as a form of scaffolding, namely support or assistance provided in learning (Nursalim et al., 2016:66). Students can freely pause, rewind, skip, or repeat certain material parts of the video that they do not understand. This process will help students manage information in their working memory (Abeysekera & Dawson, 2015). Therefore, students are expected to develop their critical thinking skills better because there is no overload on working memory.

Based on the problem above, there is a way to overcome it by using a learning model that can attract students' attention. The learning model that the researchers used is Flipped Classroom which can increase a sense of responsibility and improve students' critical thinking skills in studying economics. Moreover, by using Flipped Classroom, the learning process in the class is more active and creative, and students are freer to develop their knowledge. This model uses learning media that can be both accessed online and offline that support learning materials.

Research Method

The approach used in this research is quantitative. The type of research used was quasi-experimental. All students in the class are selected to be the population XI State Senior High School 3 Sragen which consisted of 3 classes with a total of 108 students. This research used two classes as sample; one class was used as the control class and the other class was used as the experimental class. In this research, one class acted as the control class and applied scientific learning, while the other class that acted as the experimental class applied flipped classroom learning. The instrument used in this research was a test instrument for students critical thinking skills.

The variable in this research was the independent variable in the form of a flipped classroom learning model and the dependent variable in this research was the student's critical thinking skills. The instrument used is a critical thinking test. This study uses a one-group pretest-posttest design, that is, both groups in this research were given a pre-test before the research was conducted to determine the initial state. During the research, one group was given treatment and the other group was not treated.

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The treated group was used as the experimental group, while the untreated group was used as the control group. Then, at the end of the research, both groups were given a posttest to see the final results.

Data analysis techniques in quantitative research include descriptive statistics and inferential statistics. Descriptive statistics presented the obtained data that was resulted from the pre-test and post-test of students' critical thinking skills using the flipped classroom method in the experimental and control class. Before the inferential statistical test was conducted, it was first carried out with a prerequisite test consisting of a normality test and a homogeneity test. Testing the data analysis by using the analysis prerequisite test in the form of a normality test, then carrying out a homogeneity test, and conducting a paired sample t-test to test the significance of the differences in the results of the pre-test and post-test data. All of the tests were carried out by using SPSS 21.0.

RESEARCH RESULT

1. Descriptive analysis of critical thinking skills data

a. Descriptive analysis of pre-test data

The pre-test data were used to describe the pre-test data for the experimental and control class and used statistical techniques which included the mean, median, mode, standard deviation, variance, minimum score, and maximum score. The results of the descriptive analysis of the pre-test scores of the experimental and control class of students' critical economics thinking skills can be seen in the following diagram:

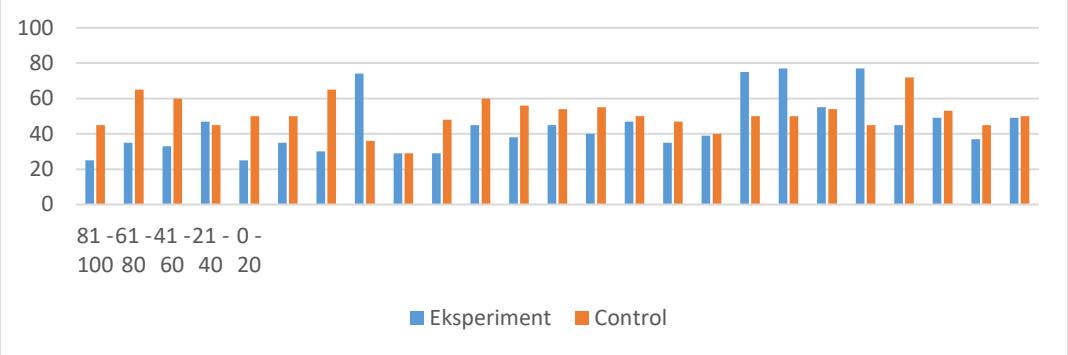

Diagram 1. Distribution of pre-test scores

Based on the diagram above, it can be seen that the high frequency of the experimental class was at a score of 61 to 80, namely 4 students with the highest score of 77, while the high frequency of the control class was 3 students with the highest score of 72. In both classes (the experimental and control class), the frequency of students who obtained scores in the sufficient category with a range of 41 to 60 for the experimental class was 8 students, while the control class was 19 students. The low frequency ranges from 21 to 40 for the experimental class is 13 students while the control class is 3 students.

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b. Descriptive analysis of post-test data

Posttest data is data obtained from the final test scores of students' critical thinking in the experimental and control class who have been given different treatments in each of the previous classes. The distribution of posttest scores for the experiment and the control class is presented fully through diagram 2 below:

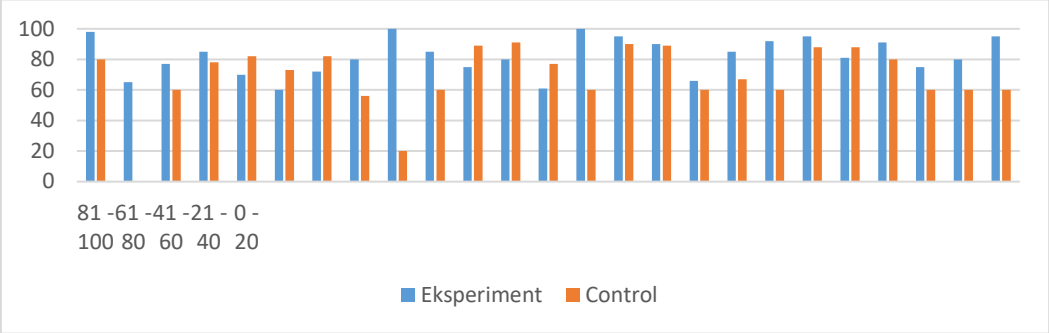

Diagram 2. Distribution of post-test scores

The results of the diagram above show that the high frequency of the experimental class is at a score of 81 to 100, namely 13 students with the highest score of 100, while the highest frequency of the control class is 8 students with the highest score of 91. In both classes (the experiment and control class), the frequency of students who get scores in the sufficient category with a range of 41 to 60 for the experimental class are 11 students, while the control class is 9 students. The low frequency ranges from 21 to 40 for the experimental class. In the experimental class, there is only 1 student, while the control class is 9 students. A very low-frequency range of <20 for the experimental class does not exist, while the control class is 2 students.

Based on data critical thinking skills before and after treatment, conclude between N-Gain, experimental class and control class can be seen. N-Gain critical thinking skills in detail can be presented briefly in table 2 below:

Table 2. N-Gain of Critical Thinking

Class	Ideal Score	High Score	Low Score	Mean Score
Experiment	1	0,67	0,17	0,42
Control	1	0,30	0,04	0,17

Table 2 shows that the ideal N-Gain score for critical thinking skills is 1. The high score of the experimental class is 0.67, while the low score is 0.17 and has an average score of 0.42. The high score of the experimental class is 0.30, while the low score is 0.04 and has an average score of c0.17.

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The conclusion in the description above, that the experimental class is better than the control class. Learning with the flipped classroom model is more effective in improving students' critical thinking skills.

2. Normality test

The results of the calculation of the normality test of students' critical thinking skills in detail care presented in Table 3. The normality test of this research used the Shapiro-Wilk test assisted by SPSS 21.0. with the criteria that if the significant value exceeds or equals c0.05, it means that the data from the pretest and posttest results of students in each class come population results care normally distributed.

Table 3. Normality Test Data of Critical Thinking Skill

Critical Thinking	Group	N	*Sig.*	Result
Pretest	Experiment	36	0,089	Normal
	Control	36	0,192	Normal
Posttest	Experiment	36	0,195	Normal
	Control	36	0,092	Normal

Table 3 shows that the data on student's critical thinking skills before and after treatment were either normally distributed or not. Data is normally distributed if the score is sig. > 0.05. Results Sig. data on students' critical thinking skills for all group criteria is greater than 0.05, so it can be concluded that the data on student critical thinking skills, both pretest and posttest, are normally distributed.

3. Homogeneity Test

The next step after doing the normality test is to do the homogeneity test. Use of homogeneity test to determine variances of several homogeneous or non-homogeneous data. The homogeneity test in this research used the Box's M Test using the SPSS 21.0 program. The test criteria are set if the significant value is greater than or equal to 0.05 then the covariances of the dependent variable are the same or homogeneous. When the significance level is less than 0.05 (Sig. < 0.05), then the data are not homogeneous. The results of the homogeneity test of the research data have been calculated using the SPSS program.

Table 4. Result of Homogeneity Test Data

Data	df1	df2	Sig.	Result
Critical thinking skill	6	15	0,172	Homogenic

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Based on Table 4, the results of the homogeneity test for critical thinking skill data show a significance value of 0.172, so the student's critical thinking skill data are homogeneous and it can be concluded that this population has met the homogeneity requirements.

After the data are homogeneous, the next step is hypothesis testing. Hypothesis testing is conducted to determine whether the hypothesis can be accepted or rejected. This research was conducted by using SPSS with the assumption that if the significant value < 0.050, then the alternative hypothesis is accepted. If it was otherwise, the significant value is > 0.050, then the alternative hypothesis is rejected. Hypothesis test results of students' critical economic thinking skills from pretest and posttest scores can be seen in the table below:

Table 5. Paired sample test results

Paired Differences						t	df	Sig.(2-tailed)
Mean		Std. Dev	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest Posttest	12.139	3.565	.594	13.345	10.933	20.431	35	.000

Based on the results of the analysis from table 5 gain t-count of 20,431. The t-count results are then equated using the t-test distribution table with a significant level of 5% and the degree of limit (df = N-1) obtained df = 36-1 = 35 and the t-table value is 2.0301. So, the value of t-count 20,431 > t-table 2,0301 and Sig. (2-tailed) = 0.000 < 0.05, there is an average difference between the results of the pretest and posttest. So, Ho is rejected and Ha is accepted, which means there is an influence from flipped classroom active learning model the ability to think critically in economics.

DISCUSSION

Two meetings were carried out in this study, at the first meeting the researchers gave a pre-test to students and then explained the learning that would be applied. Students were given a YouTube channel link to watch and study the material that had been prepared by the researcher.

In the second meeting, the researchers applied the flipped classroom learning model and then gave a post-test to students. When the learning process came, participants asked each other in a discussion forum about what they did not know and shared their opinions about problems, so participants had many opportunities to provide solutions, made the right decisions, and set improvements on both statements and wrong steps. By using flipped classroom learning, the class atmosphere becomes active, interactive, and responsive. It certainly stimulates in developing students' critical thinking skills.

Based on the results of the calculation of data analysis by using SPSS for windows version 21.0, the results of the paired samples test pretest-posttest obtained a sig. (2-tailed) value of 0.000. Sig (0.000) > 0.05 which means that it shows the difference in the pre-test and post-test. In addition to the results of the analysis obtained, namely t-count of 20,431, then equated using the t-test distribution table with a significant level of 5% and the degree of limit (df = N-1) obtained t-table value of 2.0301. So, the value of t-count 20,431 > t-table 2,0301 so that Ho is rejected and Ha is accepted.

Based on the results of the data analysis, it can be concluded that students' critical thinking skills in economics subject taught after using the flipped classroom learning model showed satisfactory results or showed good results compared to before using the flipped classroom learning model. It is proven by the average score obtained by students at the time of giving the post-test with an average value of 82.12 compared to the pre-test test with an average of 44.60. When using the flipped classroom learning model, students also get the lowest score of 76 and the highest score of 100.

CONCLUSION

from the results of the study, researchers can draw several conclusions. Here is the conclusion:

1. State Senior High School 3 Sragen uses the Flipped Classroom Learning Modelobtained an average score of 82.12. is in the "very high" category. It means that the learning process has been carried out according to the rules of using the flipped classroom learning model.

2. The students' critical thinking skill at State Senior High School 3 Sragen before using the flipped classroom learning model reached an average value of 44.60 which was in the "sufficient" category. After using the flipped classroom learning model, the average value of students' critical thinking skills reached 82.12, including the "very good" category. The conclusion is that students' critical thinking skills before and after the use of the flipped classroom learning model have increased.

3. The flipped classroom learning model has a significant effect on students' critical thinking skills. Based on the results of the table Paired Sample test of the alternative hypothesis (Ha), a significant value of 0.000 < 0.050 was obtained. Based on these results, the alternative hypothesis formulated in this research was accepted. It means "Flipped Classroom Learning Model Affects Students' Critical Thinking Ability in Class XI Social Sciences at State Senior High School 3 Sragen.

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