

The Effectiveness of The Case Method Learning Model to Improve Critical Thinking Skill

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Abstract. This study aims to describe the effectiveness of the application of the case method learning model to improve the critical thinking skills of accounting education students. The research method used is quasi-experimental by using the experimental class which is treated by applying the case method learning model and the control class using the group percentage learning method. The population in this study were accounting education students who took the Accounting Information System course using purposive sampling technique so that two sample groups were selected there are Accounting Education Class A as the experimental class and class Accounting Education Class B as the control class. The results showed that the average difference test of students' critical thinking skills in the experimental class was better than the control class. The conclusion of this research is that the case method learning model is said to be effective for improving students' critical thinking skills.

Keywords: Case Method Learning Model, Critical Thinking Skills, Accounting Information System

1 Introduction

Critical thinking skill is one of the skills that every student must have in thinking clearly and rationally about everything he or she faces. These skills will stimulate students' cognitive reasoning in acquiring knowledge. According Lai [1], according to the Partnership for 21st Century Skills, critical thinking skills are one of several learning and innovation skills needed to prepare post-secondary students and the workforce. Critical thinking skills include analyzing arguments, making conclusions, evaluating, and making decisions. These skills, of course, can help students to deal with social, scientific problems problems, and practical problems effectively [2]

Teachers can empower critical thinking skills by providing questions or problems that challenge students' thinking [3]. These skills can be improved through the process of constructivism learning. The constructivism learning model focuses on self-discovery learning, which means that learning prioritizes students' activities in every interaction to explore and build their knowledge. This concept of learning knowledge as something actively accepts anything through common sense or interaction [4].

Constructivism is the essence of the way of thinking (philosophy) through contextual approach, i.e., the knowledge captured will go through step by step, then the results are described through a narrow or limited context and not directly at once. Constructivist

approach will guide the behavior of student responses and produce an independent conceptual understanding.

The learning process is considered an educational technique such as service-learning, problem-based learning, action learning, or team learning [5]. Learning processes such as problem-based learning and team learning can provide experiences that can improve students' way of thinking. The case method is a strategy applied in the process of accounting learning by a group. Students are jointly required to complete the case. Through case methods, students hopefully can improve critical thinking skills in resolving cases related to accounting information systems. Improving critical thinking skills plays a positive role in student understanding, and the learning process is done actively and better understand the materials delivered.

Students' ability to solve problems in the accounting learning process in college can be said to have not been optimal. The way students think has not been processed effectively is seen when the learning process of most students tends to be only passive even though they have engaged in group discussions. However, the understanding that students get is still lacking in understanding. Student understanding is not only influenced by lecturers but involves various components that are intact together. The current pandemic era also has a major influence on the understanding of accounting materials. Based on most students' observations, the learning process is less effective, so that the knowledge obtained is less meaningful. The learning process occurs when there is a transfer of knowledge so that a change in behavior in students is generated, a change in behavior that can be seen (observable behavior).

In the learning process of accounting, lecturers are expected only to be facilitators who can create fun, effective, and meaningful learning conditions and situations. To achieve the desired learning situation target, lecturers need to hold innovations in the accounting learning process. One of the innovations that can be created in the learning model is applied. The learning model using the constructivism approach is expected that students will better understand and build knowledge independently and actively. Through this approach, students will be actively required to convey ideas based on the concept of knowledge that has been given through the case method learning model.

Based on preliminary studies conducted by researchers through observations on economics education students there are several lectures that have not use varied method in deliver learning materials, namely by group question-and-answer presentations. The presentation learning model has a positive impact on student's self regulate but on the other hand, and there is also a problem that is common in students turned out not understand the material that is not a part presented. This is seen on average in the pre-test results that have been conducted in the control class, and the experiment is still at 54. In other words, the result is still far from the minimum completion value of 71.

Most students still act passively to form knowledge independently because of a lack of confidence in thinking about a problem. Most critical thinking skills are still relatively low. The application of case methods in the learning process is expected to improve critical thinking skills. Research by Utami and Indriyanti [6] stated that the case method is said to be effective it is proven that the results of experimental class learning is greater than the results of learning control classes. Pratiwi et al. [7] stated that there was an influence of critical thinking on the average model class of pre test results and post test experimental class 36.92 greater than the control class of 18.21. Latifa and Alberida [8] also stated that there are significant differences between the experimental class and the control class, the experimental class has better critical thinking skills than the control class.

The purpose of this study is to describe the effectiveness of the application of case method learning model to critical thinking skills of accounting education students and to know there are significant differences between experimental classes and control classes. The urgency of this study to empirically test learning with the approach of constructivism put forward by Vygotsky based on experiments conducted by researchers. This study requires two classes as experimental classes and control classes, where the classes will be compared to see the differences in students' critical thinking skills between those classes. Experimental classes as classes to be tested by applying case methods, while control classes apply learning models as usual (question-and-answer presentations). The division of experimental and control classes can describe the effectiveness of case method learning models against critical thinking skills of accounting education students.

H1 : Case method is effective to improve students' critical thinking skills in accounting information system courses

Snyder and Snyder [9] argue that the learning process can be said to be effective if students can solve problems to make effective decisions; they must think critically. Over time the learning process requires innovations to create a conducive and fun classroom atmosphere. Innovation is constantly needed to improve the student's understanding of the demands of technology. The learning model that is often used is presentation and question and answer but after evaluating the model of learning is not yet fully effective, meaning students still do not understand accounting materials, especially accounting information systems. Case method learning model becomes an alternative to overcome the problem, by applying case method in accounting learning process is expected to improve critical thinking skills of students.

Critical thinking skills of students can be improved through the given case. Hammond [10] argued that the lecturer would challenge you and your fellow participants to defend your arguments and analysis in discussing cases. The given case contains issues surrounding real and current events concerning accounting information systems. Using the case method, the learning process will be centered on students to act actively in resolving existing cases. In analyzing the case students will be required to think critically as well in defending their arguments. Interactions that occur between students can build knowledge independently in line with the approach of constructionism. Vygotsky's constructionist approach focuses more on interactions of cultural-historical and individual interpersonal (social) factors as the key to human development [11]. With critical thinking skills, students can easily solve existing cases, and the learning process that occurs will be meaningful, meaning that the understanding of students related to a concept can be formed optimally. Ricketts and Rudd [12] argue that students competent in critical thinking can effectively identify the relationship between statements, questions, concepts, or descriptions.

H2 : There are differences in the critical thinking skills of control class students and experimental classes

Alifia [13] researched significant differences between control classes and experimental classes regarding students' creative and critical thinking abilities. Statistically obtained results show that applying learning models with metacognitive strategies (experiment classes) is better than control classes that implement conventional learning. Similarly, in the study, Mulia et al. [14] stated that there are significant differences in critical thinking skills and the independence of teaching students experimental classes and control classes. Statistical test results showed differences in experimental classes with critical thinking skill value control classes of $d=1.87$ and learning solitude $d= 1.43$. Critical thinking skills are needed in every bit

as well to support the work later. It is generally agreed upon that thinking critically is becoming imperative to success in modern life Miri et al. [15]. Through case method learning applied to experimental classes will improve students' critical thinking skills better than control classes.

2 Method

This study uses a quantifiable approach. The type of research used in this study is quasy experimental. Quasy experimental research is intended to compare between control classes and experimental classes with samples without being randomly selected. The design of this study uses pre test – posttest design, which is done pre test- post test in control class and experiment class with tests made based on critical thinking skill indicators (intrepretation, analysis, evaluation, inference, explanation, self-regulated). The pre-test is done to find out the initial ability of students. The population in this study is all accounting education students who studied accounting information systems. The population has then taken two classes of samples: Accounting Education Class A as an experimental class treated by applying the learning model case method and Accounting Education Class B as a control class that is treated presentation learning model - question and answer.

The data collection method conducted in this study is to use test research instruments. The test method in question is pre-test and post-test, which is used to know the student's thinking ability. The research data obtained will be in the normalized gain test by counting the difference between the pre-test and post-test values so that it can be known the use of case method learning models can be said to be effective or not. The data was also analyzed using normality tests and homogeneity tests. This test was conducted to determine whether the sample used in this study has a normal and homogeneous distribution. From the normality test results, it was known that the data were not distributed normally, so that non-parametric tests, namely Wilcoxon test and Mann Whitney test, found significant differences between the experimental and control classes.

3 Result and Discussion

Measurement Analysis

In this study, using two samples with different treatment results of pre-test analysis and post-test, students obtained an average score of n-gain in the control class of 0.35 and n-gain in the experimental class of 0.59.

Table 1. Result of n-gain test on control class pre-test and post-test results and experiments

	Experimental class			Control Class		
	<i>Pre-test</i>	<i>Post-Test</i>	<i>n-gain</i>	<i>Pre-test</i>	<i>Post-Test</i>	<i>n-gain</i>
Average	54,49	82,65	0,59	54,08	70,81	0,35
Minimum	30	70	0,57	40	60	0,33
Maximum	90	100	1,00	70	80	0,33

Based on table 1 shows that the value of n-gain experimental class more than the n-gain control class this means the case method model to improve critical thinking skills of students that occur in the experimental class can be categorized as a moderate category so that it can be interpreted that the case method is effective enough to improve critical thinking skills following the stated by (Richard, 1999). In comparison, the n-gain control class is in the moderate category. Although the results showed in the moderate category, the number obtained is smaller than the results of the n-gain control class, so it can be interpreted less effectively compared to the experimental class.

Table 2. Results of descriptive analysis of students' thinking ability through pre-test results and student post-tests

	Experiment	Control
Total data	49	49
Average	82,65	70,82
Standard deviation	7,296	9,091

After taking research data on students obtained final data on critical thinking skills in control classes and experimental classes after being given pre-test and post-test in both classes with materials around accounting information system. Based on descriptive analysis of critical thinking skills of control class students and experimental classes in table 2. The study results through post-test seen the average critical thinking skills of control class students and experimental classes respectively were 70.82 and 82.65. In comparison, the minimum completion criteria in economic education are 71.

We use the minimum value to see how many students can be complete on critical thinking skills has reached a minimum of 71%. The results obtained in the experimental class students who scored more than 71 were 43 students out of 49 students. The average critical thinking skill of students in the accounting information system (AIS) by using the case method learning model is better than the average critical thinking skills of students on learning with the presentation-question and answer model. Based on the hypothesis test results, the significance of the difference in critical thinking skill improvement in both classes can be done with nonparametric tests by Wilcoxon test and man Withnney test. Wilcoxon test is conducted at a confidence level of 95% in other words, the significance of 0.05 test results through wilcoxon test can be seen in table 3.

Table 3. Results of hypothesis testing with Wilcoxon's test

Test statistics
<i>Pre test – post test exsperiment class</i>

Z	-5,952
Asymp, Sig. (2-tailed)	,000

Based on the analysis results through non-parametric tests, wilcoxon test can be known that the Z value obtained is -5,952 with p value (Asymp.Sig 2-tailed) worth 0.000. The result of the value is less than the critical limit of the study < 0.05 , it can be concluded that the hypothesis is accepted. This means that there is a significant difference between the results of pre-test and post-test experimental classes, in other words, case method learning models can improve students' critical thinking skills.

Table 4. Result of mann withney test

Test statistics	
Man Witney-U	411,000
Z	-5,850
Asymp, Sig. (2-tailed)	,000

Based on the test mann-withney results obtained, the value of Z -5,850 smaller, and the value of sig (2 tailed) 0.000 is also smaller than the 0.05. Then it can be interpreted as acceptable hypotheses. So it can be concluded that there are differences in critical thinking skills of control class students and experimental classes. The critical thinking skill experimental class is higher than the critical thinking skill control class it can also be seen from the average post-test results of students of the experiment class is higher at 82.65 and the results of post-test control class as much as 70.82.

Based on empirical tests conducted, this has accepted the first hypothesis that states that the case method learning model is effective in improving students' critical thinking skills in accounting information system courses. The test results stated that the learning model is quite effective in its application and the average results of higher experimental classes and many complete students means that the value obtained is more than the minimum completion value. Based on empirical tests conducted, this has accepted the second hypothesis that states there are differences in critical thinking skills students in control and experimental classes, meaning the experimental class is better than the control class.

Critical thinking skill is an ability that every student needs today. Anggraeni (2012) stated that students who have critical thinking skills would have the best way to solve a problem using various knowledge learned. One way to improve students' critical thinking skills is by providing opportunities for critical thinking through case method learning models. Students will often interact with various cases to form their knowledge to solve each problem by relying on previously learned concepts.

Jusmaya & Evyanto (2018) in their research stated that in critical thinking skills, students must analyze a fact, trigger and organize ideas, maintain opinions, make sacrifices, conclusions and evaluate arguments until solving cases. The case method learning model indirectly also contains discussion learning between students to give opinions to each other. In learning discussions, students are required to solve problems, add and understand knowledge and make decisions [19].

This happens because students in experimental classes treated with case methods are very enthusiastic about following AIS learning. The case method is a learning model that demands critical thinking in solving the given problem. This prison student is given the freedom to self-discovery learning based on the concept learned through the given cases. What students find

becomes embedded in the memory in other words, understand the material studied. The constructivist view of learning suggests a teaching approach that provides students with opportunities for concrete, contextually meaningful experiences [20].

The application of case method model by lecturers can provide a case that can foster critical thoughts and increase students' curiosity. Case method learning is very closely related to solving a case. A group does case solving to be active and improve teamwork skills in the learning process. Students have a very important role in this learning because students must be active in finding solutions for every case. During the problem-solving process, students try to connect knowledge, experience, research results with the case. The case method learning model is student-centered learning, highly interactive pedagogy that transforms classroom processes into a collective search for analysis and solutions to specific problems based on "cases" [21].

Table 5. Percentage of test results for each critical thinking skill indicator

Indicators	Percentage result	
	Experiment Class	Control Class
<i>Intepretation</i>	89,80%	69,39%
<i>Analysis</i>	94,90%	82,65%
<i>Evaluation</i>	93,88%	81,63%
<i>Inference</i>	92,86%	79,59%
<i>Explanation</i>	73,47%	59,18%
<i>Self regulated</i>	30,61%	44,90%
Average total	79,25%	69,56%

Case method learning begins by applying a research model to give pre-tests to students to know the extent of students' initial abilities. After that, the second stage in learning is to divide students into groups randomly. In the third stage, the researchers gave a case to each group, the case was given based on real events related to the material to be delivered. The next stage, students are given time to think optimally in understanding, searching, analyzing, linking, and concluding until deciding on the given case.

In this stage, students are required to think critically in finding a solution to be active in the learning process. Students in building their knowledge will be more meaningful than just listening to a theory. At this stage, the role of the lecturer is to provide assistance or guidance, directing to find the best solution. The fifth stage of each group will present the best case and solution in front of the class in addition, the other group can give arguments to the presenter group. This aims to train the curiosity of students.

For next stage, researchers or lecturers act as facilitators and provide feedback related to learning materials to each group to build their knowledge based on what they have learned. In the last stage, the researchers gave a post-test as an evaluation of the learning process. Post-test is given to understand the extent of student understanding after applying the model of the learning case method.

Furthermore, the results of the study of six indicators of critical thinking skills based on Febri et al. [22] are (1) interpretation, (2) analysis, (3) evaluation, (4) inference, (5) explanation, (6) self-regulated. The percentage of gain on each indicator of critical thinking skills of experimental class students and control classes is presented in table 5 below. The question item that measures the interpretation indicator is items number 1 and 2 of 10 of the question. The indicator in this study is that students can translate the given case with the

correct explanation of meaning. Based on table 5 the percentage result of the interpretation indicator in the experiment class shows 89.80%, and in control class shows 69.39%. This means that the experiment class is better than the control class seen from the interpretation indicator.

Analysis indicators in this study are that students can separate, parse and distinguish something as a form of study of a problem. The question item that measures the analysis indicator is the item of questions number 3 and 4. The percentage analysis results in the experiment class showed 94.90%, while for the control class 82.65% of students had mastered the analysis indicator. This means that students in the experiment class are better than the control class judging by the analysis indicators.

Evaluation indicators in this study are expected students to assess and distinguish the best solution from a case. The question item that measures the evaluation indicator is question point number 5. Based on table 5, the percentage evaluation results in the experimental class was 93.88%, while in the control class showed 81.63% of students who had mastered the evaluation indicator. The results showed that critical thinking skill class experiments, especially evaluation indicators, are better than the control class.

Inference indicator in this study is that students can conclude after researching various sources. Based on the 5th test, the percentage result of the inference indicator showed 92.86%, while the control class showed 79.59% of students who had mastered the inference indicator. Furthermore, students are expected to dissociate the data obtained and provide opinions (solutions) correctly in this study. The percentage result of the explanation indicator in the experiment class is 73.47%, while in the control class shows 59.18%, so that it can be concluded based on inference indicators and explanation of experimental class students better than the control class.

In this study, self-regulated indicators of students' ability to become active participants in the learning process. Based on table 5, the percentage result of the experiment class shows a lower result than the control class, so that the specifics of this indicator still need to be improved. Based on table 5, the average percentage for each indicator in the experimental class is 79.25%, while the control class shows 69.56%. Critical thinking skills in the experimental class, in general, can be said to be superior to the control class. In addition, students show a positive opinion on learning by applying a case method learning model.

The determinant factor in critical thinking skills of students in the experimental class after applying the case method learning model is better than the critical thinking skills of their control class students are (1) Learning in the experiment class is carried out with a case method learning model where students are divided into groups to find solutions from cases provided by lecturers. This can train good teamwork skills among students; (2) Learning in the student experiment class discusses each other to find the best solution by building their knowledge through self-discovery learning, while in the control class, students only get theories and concepts so that the students control their abilities less developed optimally; (3) In the experimental class, in the case discussion of research, analysis, summing up and making decisions while in the control class only discussion and question and answer so that the meaning obtained in learning is less optimal; (4) In the experimental class after the discussion has finished several groups will present the solution of the given case, from this presentation process there is a process of exchanging students' knowledge.

4 Conclusion

The learning model applied with construction approach such as case method is proven to improve students' critical thinking skills. Case method variables can effectively improve students' critical thinking skills. Empirical facts show that this learning model has not been implemented properly, so the case method has not been fully applied to the learning process. This study only measures the case method learning model in the learning process of accounting information systems, based on this research requires more extensive research about case methods in other courses.

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