



# Application of *Case Method* Model Based on Character Values in Reproductive System Materials to Improve Critical Thinking and Conation skills

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**Abstract:** It is important for students to comprehend the concepts as the ability not only to understand, but also to be able to apply the concepts given to solve a problem, and to think critically about the problems during the learning process. The purpose of this study was to determine the improvement differences of students' critical thinking skills after the application of the case method model learning based on character values in the reproductive system material in SMA IT Al-Fityan and SMA IT Al-Arabiyah. The research method included quasi-experimental research with a pretest-posttest non-equivalent control group design with a sample of 116 students. Data collection techniques used was students' learning outcomes data by using pretest and posttest questions in the form of multiple choices with reasons. The questions were according to the indicators that must be achieved during learning process. Then the data was analyzed by using the average value of the pretest and posttest, then the average difference test was carried out. Hypothesis testing for students' critical thinking skills was analyzed by using  $\alpha = 0.05$  with a significant level of 0.95% with the following test criteria: if  $t_{\text{Count}} < t_{\text{Table}}$  then  $H_0$  is accepted, and if  $t_{\text{Count}} \geq t_{\text{Table}}$  then  $H_0$  is rejected. The study results in the findings that: 1) Improvement in students' critical thinking skills by applying case method learning models based on character values in reproductive system materials; 2) The character value of students was greatly improved during learning process and when students are in the environment; 3) The relation between improving critical thinking skills and character values in the learning process was excellent.

**Keywords:** Case method; Character value; Critical thinking skills

## Introduction

Education plays a very important role for the development of a nation. Various efforts have been made by each country to improve the quality of education. One of them is regarding students' mastery of the concept of the material being taught. Mastery of concepts in solving cases found by students in the world of education and students need new ways that contribute to improving the quality of learning (Andayani, 2022). It is important for students to have mastery of concepts because it is the ability of students not only to understand, but also to be able to apply the given concepts in solving a problem case, and to

understand how to think critically about problems found in learning (Sahrival et al, 2022).

Jean Piaget put forward in the theory of young adult learning begins at the age of 16 years. At that time, he had started to think concretely and his thoughts were also more abstract when he made a decision to carry out (Hendrar et al, 2021). In doing something, students prioritize the will compared to what students know in terms of the knowledge they already have. Provisions like these students are included in the realm of conation. Conation as a mental process that activates and/or directs behavior and actions. Various terms used to represent several aspects of conation include intrinsic

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motivation, goal orientation, willpower, self-direction, and self-regulation (Huitt, 2005).

Students' critical thinking can be stimulated by using the case method model in solving cases can improve students' critical thinking skills, this is due to the case method model with a very adaptable teaching style involving problem-based learning and promoting the development of critical thinking skills when students do a will that already knows in advance (Mahdi et al., 2020).

Based on this background, the researcher is interested in conducting research on "Implementation of the Character Value-Based Case Method Model in Reproductive System Material to Improve Critical Thinking and Conation Skills in Students at SMA IT Al-Fityan and SMA IT Al-Arabiyah".

**Method**

This study used a quasi-experimental method with a pretest-posttest non-equivalent control group design. In this design one class is designated as the control class and another as the experimental class. Determination of the sample is not random (Arikunto, 2017). The design of this study can be seen in Table 1.

**Table 1.** Research Design

Sample	Group	Pretest	Treatment	Posttest
Not Random	A (Experiment)	O1	X1	O2
Not Random	B (Control)	O3	-	O4

(Arikunto, 2017)

Explanation:

X = Case method learning combined with character values

O<sub>1</sub> = Pretest scores (before treatment) in the experimental class

O<sub>2</sub> = Posttest scores (before treatment) in the experimental class

O<sub>3</sub> = Pretest scores (before treatment) in the control class

O<sub>4</sub> = Posttest scores (before treatment) in the control class

The population in this study were all students of class XI SMA IT Al-Fityan and SMA IT Al-Arabiyah. The sampling technique in this study was purposive sampling. The purposive sampling criteria that will be examined are having the same ability, which is considered by researchers in this study is the class selected as a sample with the same cognitive abilities, these results are obtained from survey results while teaching in class.

The data obtained in this research is quantitative data. In the form of pretest and posttest on students' thinking and cognitive skills. The analysis technique is

to look at students' critical thinking and cognitive skills by calculating g (N-Gain). The score is only calculated from each student's correct answer, the score obtained is then converted into a value with Formula 1.

$$g = \frac{\text{posttest score} - \text{pretest score}}{\text{maximum possible score} - \text{pretest score}} \times 100 \tag{1}$$

To determine the percentage level of improvement in critical thinking and conation skills, criterion g is used as shown in Table 2.

**Table 2.** Criteria for Acquiring Value g

Coefficient Intervals	Criteria
(g) > 0.70	g-high
0.30 ≤ (g) ≤ 0.70	g-medium
g) < 0.30	g-low

(Hake, 1999)

Before testing the hypothesis, a prerequisite test is first carried out, then a hypothesis test is carried out between two different variables. normal and the data variation is not homogeneous) then a non-parametric test is performed, namely the Manwhitney test. T test with the Formula 2 (Marliani, et al., 2017)

$$t = \frac{\bar{X} - \bar{y}}{\sqrt{s^2_{xy} \left( \frac{1}{n_x} + \frac{1}{n_y} \right)}} \tag{2}$$

Explanation:

t = Test value -t

$\bar{X}$  = Average value g pretest

$\bar{y}$  = Average value g posttest

$s^2_{xy}$  = Standard deviation squared

N<sub>x</sub> = The number of sample members in the control group

N<sub>y</sub> = Number of members of the experimental group sample

Hypothesis testing for students' critical thinking skills was analyzed using α = 0.05 with a significant level of 0.95% with the following testing criteria: If t<sub>count</sub> < t<sub>table</sub> then Ho is accepted, and if t<sub>count</sub> ≥ t<sub>table</sub> then Ho is rejected.

**Result and Discussion**

The average difference test is used to determine differences in the improvement of students' critical thinking skills after and after learning. By applying the case method learning model based on character values in the human reproductive system material at SMA IT Al-Fityan and SMA IT Al-Arabiyah. The results of the pretest mean difference test and g (N-Gain) critical thinking skills of students in the experimental and control classes are presented in Table 3.

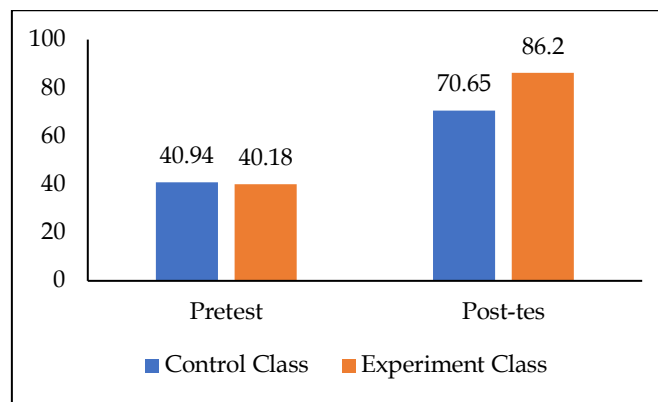
**Table 3.** Recapitulation of g (N-Gain) Improving Students' Critical Thinking Skills in Experimental and Control Classes at SMA IT Alfityan and SMA IT Al-Arabiyah

Class	Tes	Skor	g (N-Gain)	Criteria
Experiment	Pretest	40.18	0,77	g-high
	Post-test	86.20		
Control	Pretest	40.94	0,50	g-medium
	Post-test	70.65		

The experimental g score has a g-high criterion with a g value of 0.77. While the control g score has moderate g criteria with a g value of 0.50. So from the results of the acquisition of these scores there was an increase in high critical thinking skills after the application of the character value-based case method learning model in the human reproductive system material at SMA IT Alfityan and SMA IT Al-Arabiyah.

Table 3 shows the significance value, so the conclusion obtained is that the improvement of students' critical thinking skills who obtain the character value-based case method learning model is better than students who receive conventional learning. In accordance with the data obtained there is an increase in critical thinking in students by using the character value-based case method learning model. Things like that also happen in the learning process to improve students' critical thinking skills. Thus it is answered that there is an effect of using the character value-based case method learning model on the thinking skills of students at SMA IT Alfityan and SMA IT Al-Arabiyah.

From the learning process, the character values of students are balanced, according to the cases that existed when learning occurred. Students' character values become better when responding to the cases described, especially the latest students' moral knowledge from the case method case learning model that takes place. Character values are very influential when the case method learning model takes place, due to cases received by case students that they did not know before. Analysis of the pretest and posttest critical thinking skills of control class and experimental class students as a whole is presented in Figure 1.



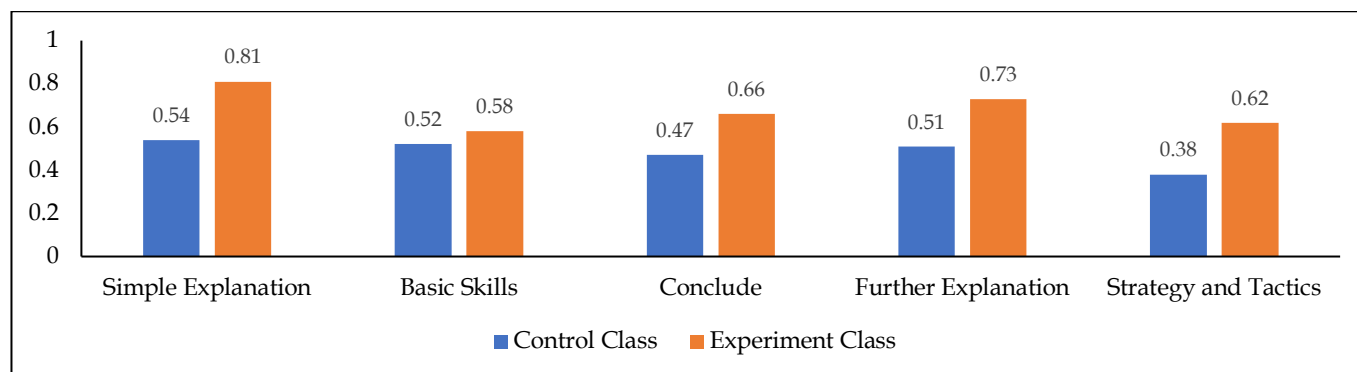
**Figure 1.** Average Pretest, Posttest Control Class Critical Skills Experiment

Figure 1 shows that the average difference in the critical thinking skills of the Pretest and Posttest participants. In the control class with the experimental class, the posttest score increased with a difference in value of 15.55. Then there was a significant increase between the control class and the experimental class.

*Improvement of Critical Thinking Skills for Each Indicator*

The improvement of each indicator of students' thinking skills consisting of simple explanations, basic skills, concluding, further explanations, strategies and tactics in the experimental class and control class is presented in Figure 2.

Overall indicators of students' critical thinking skills in general in the two control and experimental classes increased, especially in the experimental class. Experiencing a significant increase with a score of 0.27 difference between the control class and the experiment on simple explanation indicators. This causes the application of the character value-based case method learning model to provide opportunities for students to study the material, analyze arguments. Students must prepare themselves at home by reading the material that will be presented the next day. In this indicator students experience the process of analyzing arguments by investigating a reason to find out the actual situation.



**Figure 2.** g (N-Gain) Critical Thinking Skills of Control Class and Experiment Class Students Per Indicator.

Critical thinking ability is an intellectual thinking process in which thinkers deliberately assess the quality of their thinking, thinkers use reflective, independent, clear, and rational thinking. When students get used to thinking critically, students can be rational in determining and choosing the best alternative choices for themselves. Critical thinking is thinking rationally in assessing something by gathering information before making decisions on certain issues. This supports the application of the character value-based case method learning model because the case method learning model makes it possible to find cases and students focus on solving these focuses by having critical thinking skills and are also able to increase the final grade which is greater than the conventional method (Djawa, et al 2022; Nantara, 2022).

The indicator of critical thinking skills in the inference indicator also increases with a score difference of 0.19 between the control class and the experimental class, therefore, using the character value-based case method learning model gives learners to interpret, draw conclusions and consider to determine the results of consideration. Stating an interpretation is a deductive way of thinking which in its delivery requires good knowledge and experience, so that in presenting a temporary conclusion it must be with a deep understanding based on a background of facts and good sources.

Critical thinking skills in further explanation indicators also increased with a score of 0.22 difference between the control and experimental classes. This causes the application of the character value-based case method learning model to provide opportunities for students to develop their thinking skills in understanding the meaning of a term to become a further experience. In this case students are very good at identifying terms, but still have to practice a lot when identifying the terms of an argument. Students have not maximized in doing so because identifying terms must be accepted clearly and logically, based on extensive experience.

Critical thinking skills on indicators on strategy and tactics indicators also increase with a score difference of 0.24 between the control class and the experimental class, therefore using the character value-based case method model, students decide an action by considering possible solutions from what they being faced by students doing based on information and experience they have from daily life interactions. So that students can make excellent decisions and students have a full sense of believing in an outcome and taking action. Because students have gone through daily knowledge and experience and often interact with other people, it becomes a good value experience in thinking. This is interpreted by Kevin (2016) that relies on the use of case methods based on character values that are relevant to

students rather than investing a lot of time and effort needed to produce new things.

*Differences in Increasing Students' Critical Thinking Skills*

Improvement of critical thinking skills is analyzed through the formula g (Gain) by Meltzer (2002). The test results for increasing students' critical thinking skills are in Table 4.

Table 4 shows descriptive statistics on the critical thinking skills of students in the control class and the experimental class at SMA IT Al-Fityan and SMA IT Al-Arabiyah. Sig value (2-tailed) 0.000. There is a significant difference between g control and g experimental classes. The application of the character value-based case method learning model to human reproductive system material is quite significant.

**Table 4.** T-test of Students' Critical Thinking Skills in Experiment Class and Control Class at SMA IT Al-Fityan and SMA IT Al-Arabiyah

Class	N	Sig (2-tailed)	Mean	Std. Deviation	Std. Error Mean
Control Class	58	0.000	44.3278	19.37959	2.54466
Experiment Class	58	0.000	72.1207	19.37269	2.54376

Based on the research that has been done, the results obtained state that the application of the character value-based case method learning model affects students' critical thinking skills. Prior to testing critical thinking and problem-solving skills on the reproductive system material, the authors have tested the validity, reliability, index of difficulty and discriminatory power. The point is to find out whether these questions can be used as a research instrument. According to Istianah (2013) case study is a learning model that aims to determine students' critical thinking skills in solving problems in each subject area.

The social environment of students outside of school is very fragile and affects the formation of their personality. A student associated with an environment that does not strictly enforce the rules or ignores the rules does not rule out the possibility that this will have a negative impact on student behavior when in the school environment (Gani, 2018). Discipline is an orderly action and obeys various provisions and regulations that must be implemented. The implementation of the discipline character values carried out by the teacher related to the practice of questions is that each student must complete the practice questions and when in groups on time as agreed. Thus, students are required to comply with the agreements they have made (Nurlita et al, 2022).

## Conclusion

Based on the results of research on the application of character value-based case method learning to human reproductive system material at SMA IT Al-Fityan and SMA IT Al-Arabiyah, it can be concluded that there is an increase in the effect of applying case method learning model based on character value to critical thinking skills on material the human reproductive system, there is an effect of applying the case method learning model to decreasing student conation on human reproductive system material, there is a relationship between critical thinking skills and student conation applied through case method learning model on human reproductive system material.

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