

## Learning Model Group Investigation (GI) in Increasing Ability Critical Thinking Students in Animal Ecology Course

Ade Kartika

Universitas Muhammadiyah Palembang, Indonesia

Corresponding Author:  [adekartika1967@gmail.com](mailto:adekartika1967@gmail.com)

### ABSTRACT

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This study aims to determine the effect of the group investigation (GI) learning model on students' critical thinking skills, requiring one control class and one experimental class. The research method used is a quasi-experiment (quasi-experiment). Then the experimental class and the control class were given an initial test (pretest) and ended with a final test (posttest). This study also uses the documentation method as a data collection tool. Furthermore, several tests were carried out to analyze the data obtained from this study, including the normality test and homogeneity test. The results of the unpaired t-test analysis of critical thinking skills can be seen in Table 4 below. The results of the t-test for unpaired data on critical thinking skills in Table 4 show that the sig. 0.000 < 0.05 means that  $H_a$  is declared accepted, then the learning model used affects the UMP Palembang Biology study program students' critical thinking skills.

**Keywords:** *Critical Thinking Skills, Group Investigation, Learning Model*

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### INTRODUCTION

The main priority of an education system is to educate. Improving the quality of education on a micro basis is primarily determined by operational management at the school level. Education is an important issue that must receive attention from all parties; bearing in mind the importance of education in improving the standard of living and intelligence of the nation's life, it is only appropriate for the government to direct special attention to the quality of education and the expansion of learning opportunities to a higher level for teachers. Opportunities for further education for teachers aim to improve the quality of education, which is faced with the challenge of preparing quality human resources to develop tasks and responsibilities for the continuity of national development (Sele, 2021).

Educating students in all aspects, including how to educate and train students in critical *thinking* or critical thinking. Critical thinking is an ability that allows students to evaluate evidence, assumptions, and logic and make a decision about what to believe and then do so that they are successful in solving a problem they face (Wahyudi, 2020). To face the changing world is to form a culture of critical thinking. With critical thinking, students are expected to be able to analyze what they think, inform and conclude. Critical thinking determines the ability to answer problems when participating in learning activities (Azizah, 2019).

Remember that education is a conscious effort that is deliberately made or designed to achieve the goals that have been set. Education aims to improve the quality of teachers who become human resources through the teaching and learning process in schools.

Critical thinking is very important for students, especially in the Biology education study program, because critical thinking includes the whole process of obtaining, comparing, analyzing, evaluating, and acting beyond knowledge and values. In the Animal Ecology course, students' critical thinking skills are significant in learning achievement, formal reasoning, learning success, and creativity because thinking is the core regulator of student actions (Darmawan, 2021).

Learning Animal Ecology so far, Biology education study program students tend only to hone aspects of remembering (*remembering*) and understanding (*understanding*), which is low *order of thinking* (low-level thinking). Many students are still learning only to memorize concepts and rarely use prior knowledge as a basis for lesson planning. Most of the learning process on almost every learning topic still revolves around conventional methods, starting from lectures, taking notes, memorizing facts, and occasionally holding discussions. Methods like this will curb and even kill students' thinking abilities (Oktaviani, 2014).

The primary step in improving students' critical thinking is using a learning model group *investigation* (GI). The GI learning model is expected to facilitate students to improve critical thinking skills. The GI learning model is group-based learning, providing opportunities for students to discuss, think critically, and be responsible for learning. Educators can use this GI learning model to carry out learning activities well and as an alternative to improve student learning outcomes and critical thinking abilities (Fakhriyah, 2014).

In the GI learning model, the lecturer's job is to initiate learning by providing choices and control for students to choose how they want to do and learn. Students choose the topic they want to study following an in-depth investigation of the selected subtopics. Then prepare and present a report in front of the class. Student engagement (*student-centered*) in this learning will foster a solid and independent character. Besides that, student involvement in learning requires a pleasant atmosphere and freedom to achieve good results. These results will foster excellence in understanding the material and thinking (Susmita, 2020).

Critical thinking is an active and skillful intellectual process in making sense of concepts, applying, analyzing, synthesizing, and evaluating. These activities are based on observations, experiences, thoughts, considerations, and communications, which will guide in determining attitudes and actions.

## METHODS

This study aims to determine the effect of the learning model group *investigation* (GI) on students' critical thinking skills, requiring one control class and one experimental class. In this design, two classes are given different treatments (learning models) to see whether using the learning model group *investigation* (GI) affects students' critical thinking skills.

The research method used is like *an experiment* (pseudo-experiment). Then the experimental class and the control class were given pre-tests (*pretest*) and ended with a final test (*posttest*). This was done to determine the effect of using the learning model. The treatment of the learning model was given group investigation (GI) in the experimental class, while the control class was treated with conventional learning models. The research design can be seen in table 1.

This research was conducted at FKIP UM Palembang in the odd semester of 2016/2017. The data obtained in this study is data collected from the results of critical thinking skills tests given to students of the Biology education study program UM Palembang in odd semesters of the 2016/2017 odd academic year. The chosen subject is Animal Ecology. The selected data is in the form of questions pre (preliminary test) and post-test (final test) given to two different classes, namely one experimental class and one control class. The class chosen to be the experimental class was class A which consisted of 34 students. This class used a learning model group *investigation* (GI), while the class chosen as the control class was class B which consisted of 34 students in this class using conventional methods. Pre-test questions are given at the beginning of the meeting, while post-test questions are given at the end.

Furthermore, several tests were carried out to analyze the data obtained from this study, including the normality test and homogeneity test. After that, the hypothesis test was carried out. The hypothesis test was the paired t-test *sample t-test*, using SPSS version 23.0.

## RESULTS AND DISCUSSION

### Results

The percentage of achievement of critical thinking skills *pretest* (preliminary test) and *posttest* (final test) in the experimental and control classes can be seen in Tables 2 and 3. Based on the Figure above, the percentage value of the achievement of critical

**Table 1 Form of Research Design**

Subject	Pretest	Treatment	Posttest
Class A	O <sub>1</sub>	X	O <sub>2</sub>
Class B	O <sub>3</sub>	-	O <sub>4</sub>

Information:

Class A: Class A student research subjects (experimental class)

Class B: Class B student research subjects (control class)

O<sub>1</sub> : Administering the initial test to the experimental class

O<sub>2</sub> : Give the final test to the control class

O<sub>3</sub> : Preliminary test given to the control class

O<sub>4</sub> : Administering the initial test to the experimental class

X : Using the group investigation (GI) learning model

- : Control class using conventional models

thinking skills in the experimental class is higher than the percentage value of achieving the results of critical thinking skills in the control class. In the control class, the most significant percentage is in the evaluating indicator, with a score of 85.5. In the experimental class, the largest percentage is in the explaining indicator, with a score of 99.2.

The two tables show a difference in the percentage of achieving the results of critical thinking skills between the experimental class using the learning model Group investigation (GI) and a control class that uses a conventional learning model. Based on the data presented in Table 3 and Figure 1, it can be seen that the overall percentage for the six critical thinking indicators obtained different results.

The percentage of critical thinking skills of education study program students at the University of Muhammadiyah Palembang on indicators of interpreting values-pretest by 28.6% in the low category and increased to 39.7% in *posttest* the test in the low category. The indicator analyzes the pretest value of 45.5% in the medium category and increases to 61.0% in the *posttest* with a high category. The indicators explain the value pretest of 69.8% in the very high category and increase to 83.8% in the *posttest* with a very high category. The indicators conclude the value pretest by 47.7% in the moderate category and increase to 64.7% in the *posttest* with a high category, on the indicators evaluate the value pretest by 72.0% in the high category and increased to 85.2% in the *posttest* in the very high category, while in the self-regulation indicator, the pretest score was 18.3% in the very low category, and increased to 29.4% *inposttest* with low category. Based on the six critical thinking skill indicators, the highest percentage is the evaluating indicator, and the lowest is the self-regulation indicator.

**Table 2 Percentage of Achievement of Control Class Critical Thinking Ability Results**

No	Indicator	Treatment (class control)			
		Pretest	Cathegory	Posttest	Cathegory
1	Interpretation	28,6%	Low	39,7%	Low
2	Analysis	45,5%	Currently	61,0%	Tall
3	Explanation	69,8%	Tall	83,8%	Very high
4	Conclude	47,7%	Currently	64,7%	Tall
5	Evaluation	72,0%	Tall	85,2%	Very high
6	Self-regulation	18,3%	Very low	29,4%	Low

(Processing Source Data SPSS 23.0)

**Table 3. Percentage of Achievement of Experimental Class Critical Thinking Ability Results**

No	Indicator	Treatment (class control)			
		Pretest	Cathegory	Posttest	Cathegory
1	Interpretation	57,3%	Currently	66,9%	Tall
2	Analysis	63,2%	Tall	72,7%	Tall
3	Explanation	89,7%	Very high	99,2%	Very high
4	Conclude	74,2%	Tall	92,6%	Very high
5	Evaluation	76,4%	Tall	92,6%	Very high
6	Self-regulation	39,7%	Low	52,9%	Currently

(Processing Source Data SPSS 23.0)

The results of the unpaired t-test analysis of critical thinking skills can be seen in Table 4 below. The results of the t-test for unpaired data on critical thinking skills in Table 4 show that the sig.  $0.000 < 0.05$  means that  $H_a$  is declared accepted, so the learning model used affects the UMP Palembang Biology study program students' critical thinking skills.

### **Discussion**

Critical thinking is one manifestation of higher-order thinking. This is because the ability to think is the highest cognitive competency that students must have. The ability to think critically is one of the initial assets useful for every human being and is a fundamental component of human maturity. Critical thinking can be seen as a student's ability to compare two or more data, such as data owned, with data received from outside (Meirisa, 2018).

Thinking is a mental activity to help solve problems, make decisions, or satisfy curiosity. Thinking skills consist of basic thinking skills and higher-order thinking skills. Basic thinking skills (*lower order thinking*) only use limited abilities on routine and mechanical matters, for example, memorizing and repeating information given previously. Meanwhile, high-level thinking skills (*higher-order thinking*) allow students to interpret, analyze or even be able to manipulate previous information so that it is not monotonous. High thinking ability (*higher-order thinking*) is used when someone receives new information and stores it for later use or rearranges it for problem-solving based on the situation. The ability to think critically and creatively is a high-order thinking skill that must be developed in learning (Samura, 2019).

Critical thinking is a cognitive activity related to the reason (Rositawati, 2018). Thinking critically means using mental processes, such as paying attention, categorizing, selecting, and deciding. The ability to think critically provides the right direction in thinking and helps in determining the relationship of one thing to another more accurately. Therefore critical thinking skills are needed to solve problems and find solutions.

The ability to think critically is essential for life, work, and to function effectively in all other aspects of life (Liberna, 2012). The ability to think critically is needed considering that today science and technology is developing very rapidly and allows anyone to obtain information quickly and easily with abundance from various sources and anywhere in the world. This resulted in rapid changes in the order of life as well as global changes in life. If you are not equipped with the ability to think critically and creatively, you will not be able to process, assess and take the information needed to face these challenges. Therefore the ability to think critically and creatively is an important ability in life.

Critical thinking skills are intellectual potential that can be developed through the learning process (Novikasari, 2015). Every human being has the potential to grow and develop into a critical thinker because actually thinking activities have a relationship with self-management patterns (*self-organization*) that exists in every creature in nature including humans themselves. There is an assumption that it is important for us not only to learn to think critically, but also to teach critical thinking to others. This assumption is very important because for someone to be successful in any field, he must have the ability to think critically, he must be able to reason inductively and deductively, such as when he criticizes and consumes ideas or suggestions. These critical thinking skills are commonly recognized as an important educational goal, and are considered a desired outcome of all human activities.

Critical thinking is self-regulation in deciding (judging) something that results in interpretation, analysis, evaluation, and inference, as well as presentations using evidence, concepts, methodologies, criteria, or contextual considerations on which decisions are made. Critical thinking is important as a tool of inquiry. Critical thinking is a strength and a source of energy in one's social and personal life (Magdalena, 2020). Critical thinking is an intelligent disciplined process of active and skillful conceptualization, application, analysis, synthesis, and evaluation gathered from, or generated by, observation, experience, reflection, reasoning, or communication as a guide to belief and action.

## CONCLUSION

Based on results of research data analysis Piret sample t-Test data pretest and posttest shows that the learning model Group Investigation in the animal ecology course on students' critical thinking, Critical thinking is a cognitive activity related to the use of reason. Learning to think critically means using mental processes, such as paying attention, categorizing, selecting, and deciding.

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