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The Effect of Group Investigation Learning Model on Science Education Students' Mastery of Environmental Pollution and Creative Thinking

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Abstract

The learning process in the classroom still tend to focus on the teacher, causing less students are actively involved in the learning process seen in the number of students who ask and answer questions that lead to low test score is below standard. Application of group investigation learning model was expected to improve the mastery of concepts and creative thinking of students. This research aimed to determine the influence of the learning model group investigation to the mastery of concept environment pollution and creative thinking in high school student of class X. The research method used was quasi-experimental with the research design post-test control group design. The research sample of 60 students was 30 students each in the experimental class and control class by simple random sampling. The instrument used was the test the ability of mastering concept and creative thinking test. based on the analysis the data were normally distributed and homogeneous. The result of this reseach 1). There an influence of learning model group investigation of the mastery of concept inveronment pollution and creative thinking student 2). Mastery of concepts students using learning model group investigation to get a better score than the students who use STAD learning model with value (t_{count} = 4,118) 3). Creative thinking abilities of students using learning model group investigation to get a better score than the students who using learning model STAD with value (t_{count} = 2.731).

Keywords: Creative thinking, Group investigation, Mastery of concept

INTRODUCTION

Current learning requires students to be actively involved, so it is necessary to learn by using the right learning model. Suhardi (2012) Biology learning, among others, provides knowledge of various types of ecosystems and the environment about their use for daily life, develops process skills, develops insights, attitudes and values and demands the ability to think logically, critically and systematically analyse. The problems faced in learning biology, especially in environmental pollution material, are that the learning process in the classroom still tends to focus on the teacher as the main source, and the lecture method is the main choice in the learning process. This lecture method causes students to be less actively involved in the learning process, causing low concept mastery scores, which are still below the passing grade standard of 70 for environmental pollution material. This indicates a lack of mastery of student concepts in environmental pollution material.

Concept mastery is included in the category of intellectual proficiency learning outcomes. This is because concept teaching presents human efforts to classify human learning experiences. Concept teaching encourages students to be more creative in understanding the subject matter because concepts can reduce the complexity of a studied material or object (Nurmantoro, 2019). Another problem in biology courses on environmental pollution material is the lack of students' creative thinking skills. The results of interviews with biology subject teachers show that the number of students who ask and answer questions when learning about environmental pollution material is minimal. Even in some classes, no one asks. Creative thinking ability is a cognitive skill that solves a problem or makes something new from the usual thing.

Therefore, teachers need to choose the right learning model to be able to improve the ability to master concepts and creative thinking so that students can accept learning and apply it in everyday life, both now and in the future. One of the learning models that can be applied in learning biology to improve students' concept mastery and creative thinking is the Investigation Group learning model. Aprilia (2015) Investigation Group learning affects the ability to master concepts because the Investigation Group learning model can be implied by giving conceptual and contextual problems or questions. The Investigation Group learning model is a learning model with a student approach to authentic problems (real problems), so that students can develop their own knowledge, grow higher skills and inquiry, empower students and increase their self-confidence. So that the Investigation Group learning model can improve students' creative thinking skills (Haryati, 2019)

The advantages of using the Investigation Group model in learning are expected to stimulate interaction between students both physically, intellectually, and emotionally because

each student in the group has a role in planning, carrying out, and reporting the results of their investigations in learning. Learning biology using the Investigation Group learning model is an innovative learning method that can help students build their understanding with teacher guidance. Rusman (2010) The search for information or investigation makes students learn independently and creatively to master a learning concept completely. Teachers can also use the Investigation Group learning model to develop students' creative thinking skills individually and in groups. The Investigation Group learning model is designed to help the division of responsibility when students participate in learning and is oriented towards forming social human beings.

METHOD

The research method used was quasi-experimental, with the research design being a post-test control group design. The research sample of 60 students from a junior high school in Indonesia. There were 30 students in each experimental and control class using simple random sampling. The instrument used was the ability to master the concept and creative thinking test. Based on the analysis, the data were normally distributed and homogeneous (Sugiyono, 2017)

RESULTS AND DISCUSSION

The results of students' concept mastery ability using the Investigation Group model and those using the STAD learning model. The results of calculating students' concept mastery scores using the Investigation Group learning model are the lowest score of 50 with 1 student and the highest score of 93 with an average score of 69.97 and a standard deviation of 11.53. The highest frequency is in the score range of 66-73, totalling ten students (33%), while the lowest frequency is 90-97, totalling two students (7%).

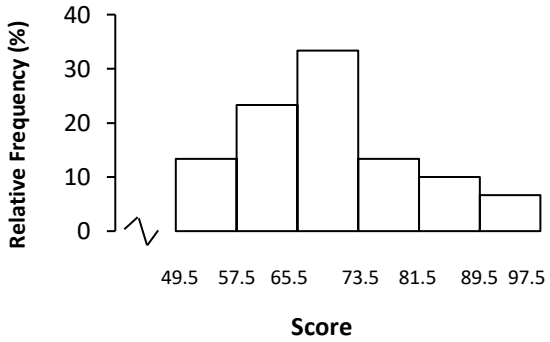

Figure 1. Histogram of students' concept mastery score with Investigation Group model

The results of calculating students' concept mastery scores using the STAD learning model are the lowest score of 28, totalling one student and the highest score of 78, totalling one student, with an average value of 56.30 and a standard deviation of 14.05. The highest frequency is in the 55-63 score range with nine students (30%), while the lowest frequency is in the 46-54 score range with two students (7%).

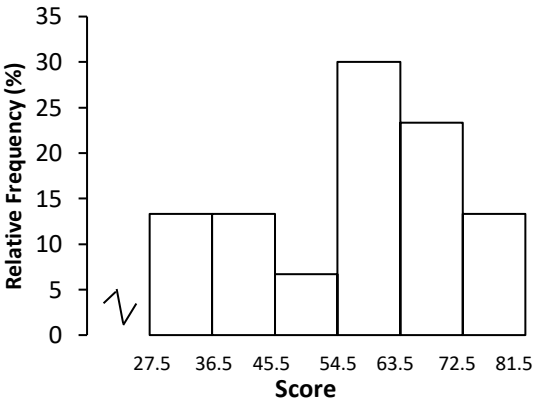

Figure 2. Histogram of students' concept mastery score with STAD model

The concept mastery score shows that students who learn with the Investigation Group model have better results than students who learn with the STAD model because the Investigation Group learning model is a learning model that uses contextual learning, where students divide labour to deal with the concepts of investigation that have been formulated and play an active role in solving problems related to environmental pollution. The search for data and information related to environmental pollution is not only obtained through books, but students can obtain data and information on environmental pollution, the causes and effects of environmental pollution by making direct observations in the field, interviews with the community and the internet. Then, students will make a report on the results of the investigation, draw conclusions, and present the results of the investigation. So that students will be able to master the concept fully. This is in line with the opinion expressed by Nasution (2019) who said that using the group investigation model can improve learning outcomes.

Based on the characteristics and stages in the investigation group learning model, it is clear that it can lead students to develop all their skills in conducting investigations, compiling reports and presenting report results, which can train students' concept mastery abilities. In the learning process using the investigation group model, students are given the responsibility to solve a given problem, and students are trained to analyse a problem they find when making observations so that students' analytical skills in solving a problem will be better so that students will be able to master the concept of environmental pollution fully.

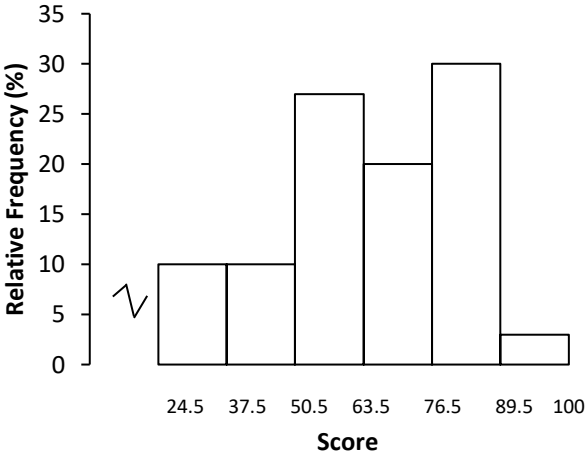

Figure 3. Histogram of students' creative thinking scores with the Investigation Group model

The results of calculating students' creative thinking scores using the STAD learning model are the lowest score of 24, totalling 1 student and the highest score of 80, totalling 1 student with an average value of 52.20 and a standard deviation of 16.22. The highest frequency is in the 48-59 score range with 7 students (23%) while the lowest frequency is in the 84-100 score range with 1 student (3%).

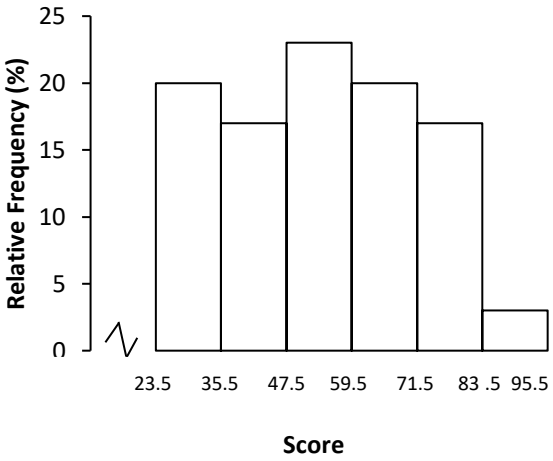

Figure 4. Histogram of students' creative thinking score with STAD Model

Students' creative thinking scores showed that students who received learning using the Investigation Group model had better results than students who received learning using the STAD learning model. The investigative group learning model can lead students to develop all their skills and abilities in the learning process.

Based on the characteristics and stages in the Investigation Group learning model, it is clear that it can lead students to develop all their skills in conducting investigations compiling reports and discussions in class, which in turn can train students' creative thinking skills.

The Investigation Group learning model can lead students to develop all their skills and abilities in the learning process. Based on the characteristics and stages in the investigative

group learning model, it is clear that it can lead students to develop all their skills in conducting investigations and compiling reports and discussions in class, which in turn can train students' creative thinking skills (Suartika, 2013). In Investigation Group learning activities, students are required and trained to be creative and come up with original ideas in designing and carrying out observations according to the learning material they learn so that students' creative thinking skills will be realised if there is support from the environment, or if there is a strong urge in themselves to produce something, creative thinking can develop when students have direct interaction in the school environment or in the community environment.

CONCLUSION

The Investigation Group learning model affects the ability to master concepts on environmental pollution material and creative thinking of students. The concept mastery ability of students using the Investigative Group learning model scores better than those using the STAD learning model. The creative thinking ability of students using the Investigative Group learning model scores better than those using the STAD learning model.

The implication of this research is the increase in the ability to master the concept of environmental pollution and creative thinking of students by applying the investigative group learning model. The Investigation Group learning model can be applied on other Biology materials to improve students' concept mastery and creative thinking skills.

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