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Effectiveness of application of group investigation learning model on the subject of excretion systems based on interest in learning towards class VIII science learning outcomes in SMP Negeri 10 Manado

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Abstract
This study aims to determine the effectiveness of the application of group investigation learning models on the subject of excretion systems based on interest in learning towards class VIII science learning outcomes in SMP Negeri 10 Manado. The population in this study were eighth-grade students of SMP Negeri 10 Manado with a sample of 64 people, namely students in class VIII1 and VIII6. Each class was divided into high-interest groups and low-interest groups. The division of groups is determined by using interest questionnaires that have previously been tested for validity and reliability. The data taken from the research is science learning outcomes data as measured by cognitive test questions that have previously been tested for validity and reliability. Hypothesis testing was done by using a two-way analysis of variance (ANAVA) with treatment by level design. The results of this study showed (1) there were significant differences in science learning outcomes between students who were taught using an investigation group learning model and students who were taught using conventional models F_{count} (4.1264) > F_{table} (4.00). (2) there is an interaction between the use of the learning model and the interest of students in the learning outcomes of science F_{count} (20.122) > F_{table} (4.00). (3) there are significant differences in science learning outcomes between students who are taught using group investigation learning models with high interest and students who are taught using conventional learning models with interest in t_{count} (4.608) > t_{table} (1.67). (4) there are significant differences in science learning outcomes between students who are taught using a learning model of group investigation with low interest and students who are taught using conventional learning models with low interest in t_{count} (-1,735) < t_{table} (1.67).

Keywords: learning model, learning interest, learning outcomes

1. Introduction

Law No.20 of 2003 (Sudrajat, 2010) [4] on the national education system explains that: "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble character, and skills needed by him, society, nation, and state". Every teacher must want students to perform well, but to achieve this is not an easy thing. Because learning is influenced by many factors. In line with the opinion of Dalyono (2009) [1], the factors that influence student learning outcomes are classified into two groups, namely internal factors (health, intelligence, talent, interest, motivation, and how to learn) and external factors including family, school, society, and the surrounding environment.

Based on the results of observation of science learning in SMP Negeri 10 Manado in class VIII showed that teaching and learning activities in the teacher class used the question and answer method and learning was still centered on the teacher, but the teacher had tried to involve all students. This can be seen during the teaching and learning process, the teacher conducts interactions with the students with a question and answer method. In these learning activities, not all students take an active part in the questions and answers made by the teacher. The involvement of students is still lacking and not yet comprehensive. When the teaching and learning process in schools is often found by students whose learning outcomes are low due to the lack of learning the interest of students in these subjects, especially specifically for science subjects.

Facing this reality, it takes an effort from the teacher to arouse interest in students so that later it will have a good impact on improving student learning outcomes. Learning material that attracts students, is younger to be studied and stored, because of the interest in increasing learning activities. Winkel (2009) [10] argues that learning in humans can be formulated as a mental or psychological activity that takes place in active interactions with the environment, which results in changes in knowledge and attitude values. Changes are relatively constant and trace.

Wahidmurni, *et al.* (2010) [9] explained that someone can be said to have succeeded in learning if he was able to show a change in him. These changes include in terms of thinking skills, skills, or attitude towards an object.

Group investigation is one of the active learning models because students will learn through the process of forming individually, and sharing knowledge and responsibility with their groups. Group investigation has three main concepts, namely: research or inquiry, knowledge or knowledge, and group dynamics or the dynamic of the learning group (Winaputra, 2001). Teachers who use the group investigation model generally divide the class into groups of 5 to 6 students with heterogeneous characteristics, (Trianto, 2007) [7]. Eggen & Kauchak in Maimunah (2005) [3] suggests group investigation is a cooperative learning

strategy that places students into groups to investigate a topic.

According to Ujang Sukandi (2003) [5], defining that conventional approaches are characterized by teaching teachers to teach more about concepts rather than competencies. The goal is that students know something is not able to do something, and during the learning process, students listen more.

Slameto, (2013) [6] gives a formulation of interests as follows: "Interest is persisting tendency to pay attention to and enjoy some activity or content". Activities that are of interest to someone, are constantly being watched with pleasure.

The purpose of this study was to determine the effectiveness of the application of the group investigation learning model on the subject of the excretion system based on interest in learning towards class VIII science learning outcomes in SMP Negeri 10 Manado.

Research and methods

The research method used experimental research. The research design uses ANAVA by level treatment design. This research was conducted in March 2019 at Manado State Middle School 10SMP Negeri 10 Manado. The population in this study were all students of class VIII at SMP Negeri 10 Manado in the academic year 2018/2019. The sample in this study were students of class VIII1 and students of class VIII6 which amounted to 64 people and divided into 2 groups with the same number. Sampling was taken randomly. The class was divided into two, the first group is the experimental class and the second group is the control class. The experimental class was treated using the group investigation learning model, while the control class was treated using conventional learning models. Each class was grouped based on student interest in learning. In the experimental class grouped in 2 groups, namely the group investigation group learning model with high interest and learning model group investigation with low interest. In the control class, it was grouped into 2 groups as well, namely the group of conventional learning models with high interest and groups of conventional learning models with low interest. The research design can be seen in the following table.

Table 1: Treatment design by level 2x2

Interest	Learning Model	
	A_1	A_2
B_1	A_1B_1	A_2B_1
B_2	A_1B_2	A_2B_2

Information

A1 = Group investigation learning model

A2 = Conventional Learning Model

B1 = High Interest

B2 = Low Interest

Data analysis techniques consist of a prerequisite test and hypothesis test. The prerequisite test consists of a normality test and a homogeneity test while the hypothesis test uses a 2-way ANAVA test.

Results and discussion

The description of the research data can be seen in table 2.

Table 2: Average Score of Learning Outcomes for Each Treatment Group

Treatment Group	Average Score of Learning Outcomes
A1	87.78
A2	79.01
B1	85.67
B2	76.12
A1B1	91.71
A1B2	7.84
A2B1	79.63
A2B2	78.3

This study shows that the learning outcomes of groups of students who use group investigation learning models are higher than the learning outcomes of groups of students who use conventional learning models. These results can be seen from the average learning outcomes where the group investigation group learning model has an average value of 82.78 and the conventional learning model group has an average value of 79.01. Based on the test results ANAVA gives the price of $F_{count} = 4.12 > F_{table} = 4.00$. That means there are differences in science learning outcomes between students who are taught using the investigation group learning model and students who are taught using conventional learning models. Based on the observations of researchers, in the group investigation learning model, students tend to be required to be directly active on the problems given. The investigation group learning model spurred students to work together so that it affected the learning outcomes of each student.

In the second hypothesis in this study, the use of learning models in covering learning activities to discuss in the scientific process. The interest of students also influences the learning outcomes of these students. This study shows that there is an influence of the interaction between the group investigation learning model and interest in science learning outcomes. Based on the ANAVA test results for the interaction effect of $F_{count} = 20.12 > F_{table} = 4.00$ it means that there is a significant interaction between the learning model and the interest in science learning outcomes. This shows that there is a significant influence between the interest of students in the group of high interest and low interest with the application of the existing investigation group learning model and conventional learning models on learning outcomes of science.

The third hypothesis of this study shows that groups of students with high-interest who use the investigation group learning model give higher results than groups of high interest students who use conventional learning models. The average learning outcomes of students who use group investigation learning models with high interest are 91.71, while the average learning outcomes of students using conventional models with high interest are 79.63. Based on the results of the t-Dunnet test calculation, the price of $t_{count} = 4.608 > t_{table}$ 0.167.

This study shows that groups of students with low interest who are taught using the investigation group learning model give lower results than the group of students with low confidence who are taught using conventional learning models. The average learning outcomes of students who use the learning model group investigation with low interest is 73.84 while the average learning outcomes of students who use conventional learning models with low interest are 78.39. Based on the results of the calculation of the t-Dunnet test giving the price of t count = -1,735 <t table = -0,167.

Based on the observations of researchers in the field, students who have low interest who are taught using conventional learning models have higher scores because they better interpret their abilities through teacher guidance and lectures in learning. This affects the learning outcomes of students.

Conclusion

Based on the results of the research and discussion conducted it can be concluded that:

1. There are significant differences in science learning outcomes between students who are taught using the group investigation learning model and students who are taught using conventional learning models.
2. There is an interaction between the use of learning models and interests in science learning outcomes.
3. There are significant differences in science learning outcomes between students who are taught using group investigation learning models with high interest and students who are taught using conventional learning models with high interest.
4. There are significant differences in science learning outcomes between students who are taught to use a learning model group investigation with low interest and students who are taught using conventional learning models with low interest.

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