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Effectiveness of the application of cooperative learning models of think pair share type in the subject of environmental pollution based on student learning motivation on science learning outcomes in class VII SMP Negeri 10 Manado

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Abstract
This study aims to determine the effectivity of the application of the think pair share type of cooperative learning model on the subject of environmental pollution based on student learning motivation towards science learning outcomes in class VII Manado 10 Middle School. The population in this study were seventh-grade students of SMP Negeri 10 Manado with a sample of 64 people, namely students of class VII6 and students of class VII7. The research method uses experiments. Each class was divided into high motivation groups and low motivation groups. The division of groups is determined using learning motivation 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 indicate (1) there are significant differences in science learning outcomes between students taught using Think Pair Share cooperative learning models and students taught using conventional learning models, F_{count} (4.12) > F_{table} (4.00). (2) there is an influence between the use of learning models and motivation on science learning outcomes, F_{count} (20.12) > F_{table} (4.00), (3) there are significant differences in science learning outcomes between students taught using learning models cooperative think pair share type with high motivation and students taught using conventional learning models with high motivation, t_{count} (4.608) > t_{table} (0.167), (4) there are significant differences in science learning outcomes between students taught using Think type cooperative learning models pair share with low motivation and students taught using conventional learning models with low motivation t_{count}t (-1.735) < t_{table} (-0.167).

Keywords: learning model, motivation, learning outcomes

1. Introduction
Education is a process in order to influence students to be able to adjust as well as possible with their environment, so as to cause changes in themselves that function in lives of people (Hamalik, 2014) [2]. Natural science is defined as a science that studies and discusses events that occur in nature that are systematically obtained through data collection, experiments, observations to achieve an explanation to be achieved in a learning process. The science learning process will run effectively and efficiently if it is supported by a learning model strategy that supports the learning process.
One of the main problems in the world of education today is based on observations with science teachers at SMP Negeri 10 Manado and direct observations during the learning process with the teacher and students found that science learning is still teacher-centered, the learning process uses conventional models or lectures with practice questions and also the existence of various damaged and incomplete science teaching aids, so that in this learning process the teacher plays an active role while students are only listeners and writers.
Interactions that occur only between teachers and each student, but there is no interaction between students and students. Some students seemed lackluster and less motivated in responding every time the teacher gave assignments from learning the material. Especially when the question and answer process takes place. When students do not find answers to the questions given by the teacher, they have no place to ask or find other answers and they lack the idea to solve the problem because the assignments are given individually.
This causes students to choose to play and not do the assignments given, so the notes that are the results of a summary of the material studied at each meeting are incomplete. This can be seen from the average test scores of students, only 50% that meet the minimum completeness requirements of 73. The use of learning models like this is not in accordance with the characteristics of students and does not increase student learning motivation.
The use of learning models that are not in accordance with the characteristics of students and lack of improvement in learning motivation is one of the factors or causes of students not mastering the concepts in learning science. The factors that influence the learning process according to Slameto (2010) [6] are internal and external factors. Internal factors are factors that originate in the individual, for example, attitudes, learning motivation. While external factors are factors that originate outside the individual one example, the learning model.
One alternative in increasing the effectiveness of appropriate learning and arousing student learning motivation in science learning is to apply innovative and interesting learning models, which provide opportunities for students to construct their own and group knowledge that

can develop scientific attitudes, namely the application of think-type cooperative learning models pair share with the selection of the subject of environmental pollution.

According to Moore D. Kenneth in Moh. Syarif (2015), the effectiveness of a measure that states how far the target (quantity, quality, and time) has been achieved, or the greater the percentage of the target achieved, the higher the effectiveness. According to Suprijono (2010) [8] argues that cooperative learning models are broader concepts covering all types of group work including forms led by the teacher or directed by the teacher.

According to Slavin (Isjoni, 2011: 15) [3] "In cooperative learning methods, students work together in four-member teams to master material initially presented by the teacher". This means that cooperative learning is a learning model where learning systems and working small groups amount to 4-6 people collaboratively so that they can stimulate students to be more passionate about learning.

Think-pair-share (TPS) strategy or thinking in pairs is a type of cooperative learning designed to influence student interaction patterns. This think-pair-share (TPS) strategy develops from cooperative learning research and waiting time. First developed by Frang Lyman and colleagues at the University of Maryland as quoted by Arends (Trianto, 2007) [9] states that think-pair-share is an effective way to vary the atmosphere of class discussion patterns. Assuming that all recitation or discussion requires arrangements to control the class as a whole, and the procedures used in the think-pair-share can give students more time to think, to respond, and help each other. The teacher estimates that only completes a short presentation or the student reads the assignment, or the situation becomes a question mark. Now the teacher wants students to consider more what has been explained and experienced.

According to Djamarah in (Dimyati 2006), conventional learning methods are traditional learning methods or also called the lecture method, because this method has always been used as an oral communication tool between teachers and students in the process of learning and learning.

According to Purwanto (2000) [5] motivation is closely related to a goal and ideals. The more valuable the goal is for the person concerned, the stronger his motivation will be so that motivation is very useful for one's actions or actions.

Jumarni, (2013) [4] states that learning outcomes are behaviors that individuals have as a result of their abilities and skills through experience. Learning outcomes are one of the goals to be achieved in the learning process or it can be said that the achievements achieved during the learning process. Learning outcomes can be measured through tests that are often known as learning outcomes tests. The purpose of the learning outcomes test is to uncover one's success in learning. Selection of the appropriate learning model is expected to increase motivation in students so that students have high motivation in the learning process and can improve student learning outcomes.

The purpose of this study was to determine the effectiveness of the implementation of the cooperative learning model Think Pair Share (TPS) on the subject of environmental pollution in terms of student learning motivation towards science learning outcomes in class VII SMP Negeri 10 Manado.

Research Methods

The research method used is experimental research. The study design used a by-level ANAVA treatment design. This research was conducted in March 2019 in SMP Negeri 10 Manado. The population in this study were all VII grade students in SMP Negeri 10 Manado 2018/2019. The samples in this study were students of class VII6 and students of class VII7 which amounted to 64 people and divided into 2 groups with the same number. Classes were divided into two groups, namely the experimental class and the control class. The experimental class was treated using the Cooperative Think Pair Share type of learning model, while the control class was treated using conventional learning models. Each class was grouped based on student learning motivation. In the experimental class 1 grouped in 2 groups, namely the group of cooperative learning models Think Pair Share with high motivation and cooperative learning models of Think Pair Share with low motivation. In the control class grouped in 2 groups, namely groups of conventional learning models with high motivation and groups of conventional motivational learning models. The research design can be seen in the following table.

Table 1: Treatment Design by Level 2x2

Motivation	Learning Model	
	A_1	A_2
B_1	A_1B_1	A_2B_1
B_2	A_1B_2	A_2B_2

Information
A1 = Think Pair Share Learning Model
A2 = Conventional Learning Model
B1 = High Motivation
B2 = Low Motivation

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 the table below.

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

Treatment Group	Average Score of Learning Outcomes
A1	82.78
A2	79.01
B1	85.67
B2	76.12
A1B1	91.71
A2B1	79.63
A1B2	73.84
A2B2	78.39

This study shows for the first hypothesis that the learning outcomes of groups of students who use the cooperative learning model Think Pair Share (TPS) is 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 with the cooperative learning model Think Pair Share (TPS) has

an average value of 82.78 and the group with high motivation conventional learning models has an average value of 79.01. Based on the ANAVA test results, the price of F_{count} = 4.12 > F_{table} = 4.00 means that there are differences in science learning outcomes between students taught using Think Pair Share (TPS) type cooperative learning models and students taught using conventional learning models.

Based on the results of direct observations by researchers in classroom learning activities, the assessment of students through the worksheets they are working on and through the posttest results using the cooperative learning model Think Pair Share (TPS) has a dominant average value higher than the class average value who use conventional learning models. In Think Pair Share (TPS) learning models, students tend to be required to be active in groups. Think Pair Share (TPS) learning model also encourages students to work together so that it influences the interaction patterns of student learning skills. Students in the class with conventional learning models, some students only as listeners and not directly involved in the learning process so that it affects the learning outcomes of each student.

In the second hypothesis of this study the use of the Think Pair Share (TPS) type of cooperative learning in learning includes learning activities carried out in cooperative learning groups to influence the pattern of student learning interactions through working in a study group consisting of several students who give them space for thinking, responding and helping each other, given also worksheets of students in the study group and post-test to measure the cognitive abilities of each student which was also seen from the students' motivation. The results of this study indicate that there is an interaction effect between the Think Pair Share (TPS) type of cooperative learning model and motivation towards science learning outcomes.

Based on ANAVA test results for the interaction effect of F_{count} = 20.12 > F_{table} = 4.00 it means that there is a significant influence between the learning model and students' learning motivation towards the learning outcomes of science. This shows that there is a significant influence between students' learning motivation in the high motivation group and low motivation with the application of the Think Pair Share type of cooperative learning model and conventional learning models on the learning outcomes of science.

Furthermore, the third hypothesis of this study shows that groups of high-motivated students who use the cooperative learning model Think Pair Share (TPS) provides higher learning outcomes than groups of students with high motivation who use conventional learning models. The average student learning outcomes using the cooperative learning model Think Pair Share with high motivation is 91.71 while the average learning outcomes of students who use high motivation conventional learning models 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 price is greater than the table price of 0.167 so that there are significant differences in science learning outcomes between students taught with Think Pair Share (TPS) learning models with high learning motivation and students taught with conventional learning models with high learning motivation.

Whereas for the fourth hypothesis this study shows that groups of students with low motivation who are taught using the cooperative learning model Think Pair Share (TPS) give lower results than groups of students with low motivation who are taught using conventional low motivation learning models. The average student learning outcomes using the Think Pair Share (TPS) cooperative learning model with low motivation is 73.84 while the average learning outcomes of students using conventional learning models with low motivation are 78.39. Based on the results of the t-Dunnet test (simple effect) give the price of t_{count} = -1.735 < t_{table} = -0.167. The price is less than the table price of -1.67 so that there are significant differences in science learning outcomes between students taught with TPS cooperative learning models with low learning motivation and students taught with conventional learning models with low learning motivation.

Conclusion

1. There are significant differences in science learning outcomes between students who use the Think Pair Share (TPS) cooperative learning model and students who use conventional learning models.
2. There is an influence between the use of learning models and motivation on learning outcomes of science
3. There are significant differences in science learning outcomes between students who use the cooperative learning model Think Pair Share type with high motivation and students who use a model of conventional learning with high motivation.
4. There are significant differences in science learning outcomes between students who use the cooperative learning model Think Pair Share (TPS) with low motivation and students who use conventional learning models with low motivation so the effectiveness of the application of the cooperative learning type Think Pair Share (TPS) on the subject of environmental pollution based on learning motivation can improve science learning outcomes especially in Class VII SMP Negeri 10 Manado.

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