# THE APPLICATION OF THE STAD TYPE COOPERATIVE LEARNING MODEL IN GLOBAL WARMING MATERIAL TO IMPROVE STUDENT LEARNING OUTCOMES

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## Abstract

*This study aims to analyze the improvement in student learning outcomes by applying the STAD type cooperative learning model in global warming material. This type of research is "The Static Group Pretest-Posttest Design" using one experimental class and one control class. The subjects of this study consisted of 32 students of class VII-C and VII-D of Junior High School 18 Surabaya, with class VII-C as an experimental class using cooperative learning type STAD and VII-D as a control class using daily learning at school. Data collection techniques using the test method (pretest and posttest). The results of this study indicate the completeness of learning outcomes in aspects of knowledge in class VII-C by applying the STAD type cooperative learning model by 100% with an increase in student learning outcomes using the n-gain test analysis of 0.75. The high category with an increase in N-gain in class VII-C by 75% with a high category of 32 students as many as 24 students, while students in the medium category by 25% as many as 8 students and those in the low category did not exist. The conclusion is that the application of the STAD type cooperative learning model in global warming material can improve student learning outcomes.*

*Keywords: Student Learning Outcomes, STAD Type Cooperative Learning, Global Warming.*

## INTRODUCTION

Education is a conscious and planned effort to create an atmosphere and learning process so that students actively develop their potential. The learning process should be carried out interactively, fun, and motivate students, as well as increasing efficiency as well as the effectiveness of the competencies achieved (Kemendikbud, 2016). Learning that is done should be interactive learning because there must be a process of interaction between students and teacher, students with learning resources, and students with the learning environment. Learning that is done must be able to increase students' insights about science. Knowledge itself is a concept, theory, or method that has been structurally mastered and obtained through reasoning in the learning process (Kemendikbud, 2014).

The 2013 curriculum recommends that learning requires a conducive learning environment, with varied methods, so that students can learn quietly and pleasantly. According to Salmah in Munisa (2016) fun learning is learning that can be enjoyed by students. Students feel comfortable, safe, and fun. Some of these feelings contain an element of inner motivation, which is a curiosity that is accompanied by an effort to find out something. Fun learning features are a relaxed and comfortable environment.

Science learning is something that must be done by students, not something that is done for students. In science learning, students are required to learn actively in activities so that they can affect both physically and mentally. The activities carried out not only include hands-on activities but also minds-on. In this study the provision of direct experience must be emphasized in order to develop scientific competence in exploring and understanding the natural surroundings (Hastuti, 2013).

The purpose of learning science includes developing understanding of the concepts and principles of science related to natural phenomena to be applied in everyday life. Besides learning science also aims to develop curiosity, positive attitudes, and awareness of the reciprocal relationship between science, the environment, technology, and society (Kemendikbud, 2014). To achieve these objectives, we need an interactive learning method and can increase student motivation in science lessons such as forming groups with friends, giving time to discuss with friends, giving students the opportunity to express opinions or answers from presentations so that students can be understood as a whole. Science education emphasizes on providing direct experience to develop competencies so students are able to study nature and the environment in a scientific manner such as practicing both indoors and outdoors, thus helping students to gain deeper experience about nature and the environment in one of the natural science subjects in junior high school namely "Global Warming".

Based on an interview from one of the teachers at Junior High School 18 Surabaya, the teacher stated that in learning science, the classroom they tend to use the lecture method. The teaching system is still teacher centered. The

teacher states that from the grades obtained by students of the previous year there are still very few students who complete / get a value of ≥76 (KKM) on global warming material using this learning model. This interview was conducted by asking about the condition of the school, problems faced by students, and the learning process carried out by the teacher on several materials.

The use of learning models in the learning process is able to revive student motivation to learn, so that will affect students psychologically to foster interest and desire to learn. STAD cooperative learning refers to a teaching method where students work together in small groups helping each other in learning (Anita, 2007). So in the learning process is no longer dominated by the teacher but students are also actively involved. STAD cooperative learning model is used because it has many advantages compared to conventional learning models.

Cooperative learning is developed for at least three important learning goals namely academic learning outcomes, acceptance of diversity, and the development of social skills (Ibrahim, 2000). In determining the success of a teaching when viewed in terms of results, the results of good teaching are comprehensive, not only in the cognitive aspects but also visible changes in attitudes and behavior in an integrated manner. STAD consists of five main components, namely class presentation, team formation, quizzes, individual progress scores, and team recognition (Slavin, 2011). So from these aspects the selection of the STAD cooperative model for the school is the right choice because it can motivate and assist students in improving their learning outcomes.

Some relevant research, namely Sugianto (2012) in his research shows that learning outcomes in students using the cooperative learning model type STAD on ecosystem material has increased, for affective aspects obtained an average score of 90% with a very good category. Ningsih (2013) in her research stated that using the STAD type cooperative learning model on household chemicals can improve learning outcomes for the cognitive aspects of students 88.2% with very good categories, psychomotor aspects 90.8% with very good categories and affective aspects by 84.5% with a good category. Rahayu (2013) in her research stated that using the STAD type cooperative learning model on photosynthesis can improve student learning outcomes by 83.3% with a good category. Fitri (2013) in her research stated that using the STAD type cooperative learning model on blood pressure material can improve student learning outcomes with cognitive, psychomotor, and affective aspects respectively 84.22, 81.08, and 86.5 with good categories. Suryana (2013) in his research showed that the learning outcomes of students using the STAD type cooperative learning model on sound material and the hearing system in humans increased, for affective aspects an average score of 79.8 and psychomotor aspects of students with an average score 83.3 in the good category.

From some of these studies there are some differences both from the material, tools, media, approaches to learning, to the research methods used. So that the connection with the research to be carried out can be seen that the STAD type of cooperative learning model can improve student learning outcomes in different materials where this research uses global warming material with basic competency levels on this material, namely Understanding (C1) to Analysis (C4) based on in bloom taxonomy, make the tools used are the STAD Cooperative Model Learning Implementation Plan with Scientific approach, Student Worksheet (Adaptation) on Global Warming material, then the research method used is The Static Group Pretest-Posttest Design that is using two classes as Research subjects are class VII C as an experimental class and VII D as a control class.

Based on the description above, the researcher would like to examine "Application of the STAD Type Cooperative Learning Model in Global Warming Materials to Improve Student Learning Outcomes".

## METHOD

The application of the STAD type cooperative learning model to improve student learning outcomes uses *The Static Group Pretest-Posttest Design* research model (Fraenkel & Wallen, 2012). The targets in the study were 32 students of VII-C and VII-D class Junior High School 18 Surabaya. The research instrument used was a test sheet. This test sheet includes the students' pretest and posttest sheets. Data analysis techniques using the n-gain test by analyzing the increase in the results of students' pretest and posttest (Hake, 2002). Students can be said to be complete in learning outcomes if students get a posttest score ≥76.

## RESULTS

A. Research Results

Student learning outcomes obtained from the test results are pretest to find out the activities / initial abilities of students and posttest to determine student learning outcomes after the application of STAD type cooperative learning to improve student learning outcomes. Cognitive learning outcomes in class VII-C as an experimental class and VII-D as a control class, with the number of students in each class totaling 32 students. The results of completeness learning data for classes VII-C and VII-D can be seen in Tables 1 and 2:

Table 1. Obtaining a Pretest, Posttest, N-Gain value in class VII-C as an experimental class.

| No. | Pretest | Posttest | N-Gain | Gain Category | Completeness |
|---|---|---|---|---|---|
| 1 | 46 | 82 | 0.67 | Medium | Complete |
| 2 | 58 | 86 | 0.67 | Medium | Complete |
| 3 | 56 | 86 | 0.68 | Medium | Complete |
| 4 | 50 | 94 | 0.88 | High | Complete |
| 5 | 50 | 84 | 0.68 | Medium | Complete |
| 6 | 50 | 86 | 0.72 | High | Complete |
| 7 | 54 | 84 | 0.65 | Medium | Complete |
| 8 | 54 | 90 | 0.78 | High | Complete |
| 9 | 60 | 88 | 0.70 | High | Complete |
| 10 | 56 | 84 | 0.64 | Medium | Complete |
| 11 | 50 | 84 | 0.68 | Medium | Complete |
| 12 | 58 | 90 | 0.76 | High | Complete |
| 13 | 52 | 90 | 0.79 | High | Complete |
| 14 | 54 | 88 | 0.74 | High | Complete |

| No. | Pre test | Post test | N-Gain | Gain Category | Completeness |
|-----|------|------|------|--------|--------------|
| 15 | 52 | 86 | 0.71 | High | Complete |
| 16 | 54 | 88 | 0.74 | High | Complete |
| 17 | 54 | 90 | 0.78 | High | Complete |
| 18 | 52 | 88 | 0.75 | High | Complete |
| 19 | 56 | 88 | 0.73 | High | Complete |
| 20 | 54 | 90 | 0.78 | High | Complete |
| 21 | 52 | 86 | 0.71 | High | Complete |
| 22 | 54 | 92 | 0.83 | High | Complete |
| 23 | 48 | 86 | 0.73 | High | Complete |
| 24 | 56 | 82 | 0.59 | Medium | Complete |
| 25 | 52 | 92 | 0.83 | High | Complete |
| 26 | 50 | 94 | 0.88 | High | Complete |
| 27 | 48 | 88 | 0.77 | High | Complete |
| 28 | 52 | 90 | 0.79 | High | Complete |
| 29 | 54 | 90 | 0.78 | High | Complete |
| 30 | 48 | 92 | 0.85 | High | Complete |
| 31 | 48 | 92 | 0.85 | High | Complete |
| 32 | 50 | 88 | 0.76 | High | Complete |

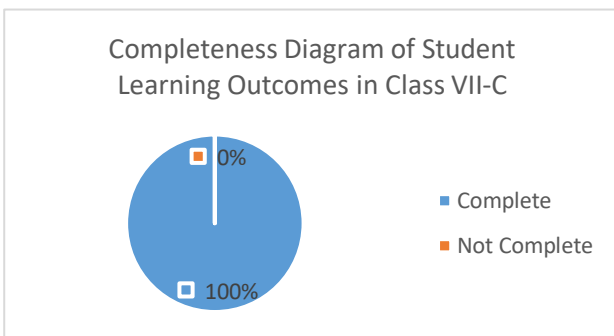| No. | Pre test | Post test | N-Gain | Gain Category | Completeness |
|-----|------|------|------|--------|--------------|
| 15 | 56 | 78 | 0.50 | Medium | Complete |
| 16 | 52 | 88 | 0.75 | High | Complete |
| 17 | 54 | 88 | 0.74 | High | Complete |
| 18 | 52 | 80 | 0.58 | Medium | Complete |
| 19 | 52 | 84 | 0.67 | Medium | Complete |
| 20 | 48 | 82 | 0.65 | Medium | Complete |
| 21 | 52 | 82 | 0.63 | Medium | Complete |
| 22 | 52 | 86 | 0.71 | High | Complete |
| 23 | 58 | 78 | 0.48 | Medium | Complete |
| 24 | 44 | 84 | 0.71 | High | Complete |
| 25 | 48 | 90 | 0.81 | High | Complete |
| 26 | 52 | 86 | 0.71 | High | Complete |
| 27 | 54 | 84 | 0.65 | Medium | Complete |
| 28 | 50 | 78 | 0.56 | Medium | Complete |
| 29 | 48 | 82 | 0.65 | Medium | Complete |
| 30 | 52 | 74 | 0.46 | Medium | Not Complete |
| 31 | 50 | 84 | 0.68 | Medium | Complete |
| 32 | 46 | 84 | 0.70 | High | Complete |



Figure 1. Completeness Diagram of Student Learning Outcomes in Class VII-C

From this diagram, it can be seen that the completeness of learning outcomes from class VII-C using the STAD type cooperative learning model has been 100% complete, meaning that all students in the class have achieved mastery learning, which has reached a score of ≥76.

Table 2. Obtaining Pretest, Posttest, N-Gain scores in class VII-D as a control class.

| No. | Pre test | Post test | N-Gain | Gain Category | Completeness |
|-----|------|------|------|--------|--------------|
| 1 | 44 | 84 | 0.71 | High | Complete |
| 2 | 50 | 80 | 0.60 | Medium | Complete |
| 3 | 48 | 80 | 0.62 | Medium | Complete |
| 4 | 46 | 74 | 0.52 | Medium | Not Complete |
| 5 | 48 | 80 | 0.62 | Medium | Complete |
| 6 | 50 | 82 | 0.64 | Medium | Complete |
| 7 | 50 | 82 | 0.64 | Medium | Complete |
| 8 | 46 | 84 | 0.70 | High | Complete |
| 9 | 54 | 82 | 0.61 | Medium | Complete |
| 10 | 56 | 78 | 0.50 | Medium | Complete |
| 11 | 52 | 80 | 0.58 | Medium | Complete |
| 12 | 54 | 80 | 0.57 | Medium | Complete |
| 13 | 50 | 84 | 0.68 | Medium | Complete |
| 14 | 48 | 82 | 0.65 | Medium | Complete |
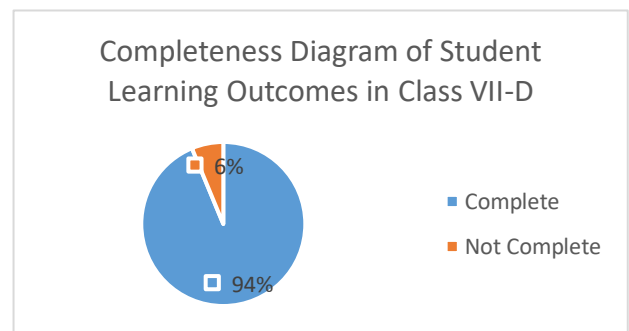


Figure 2. Completeness Diagram of Student Learning Outcomes in Class VII-D

From the diagram it can be seen that the mastery of learning outcomes from class VII-D that uses the daily learning model has been completed 94% means that 30 students in the class have achieved mastery learning which has reached a score of ≥76, while 6% still have not reached completeness learning outcomes.

Pretest and posttest results show that there is an increase in student learning outcomes. Increasing the pretest and posttest values can be known through the N-gain. Here are the results of the N-gain student learning outcomes in grades VII-C and VII-D:



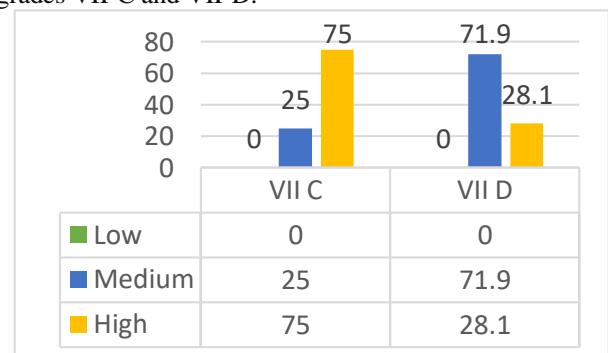| | VII C | VII D |
|---|-------|-------|
| Low | 0 | 0 |
| Medium | 25 | 71.9 |
| High | 75 | 28.1 |

Figure 3. Comparison diagram of class VII C and VII D N-Gain categories

Based on Figure 3 that the increase in N-gain in class VII-C by 75% with a high category of 32 students as many as 24 students, while students who are in the medium category by 25% as many as 8 students and those in the low category do not exist. This shows that there is an increase between the pretest and posttest scores.

The results of the N-gain analysis in class VII-D showed an increase in N-gain of 71.9% with a medium category were 23 students, while students with a high category of 28.1% were 9 students and those with a low category were absent.. This shows that there is an increase between the pretest and posttest scores.

B.  Discussion

Student learning outcomes assessed by applying the STAD type cooperative learning model are in the domain of knowledge competence. The students' pretest and posttest results can prove the difference in the improvement of learning outcomes from the application of the STAD type cooperative learning model in class VII-C with the learning model that is carried out daily in class VII-D. According to teachers who teach classes VII-C and VII-D are considered to have the same ability so that there is no difference in student academic ability. In the results of the pretest, there were no students who achieved mastery learning, the highest grade was 60 in class VII-C and 58 in class VII-D. Then with the application of the STAD type cooperative learning model and the learning model that is carried out daily this student's understanding is improved as evidenced by the students' posttest results which show that most students have achieved mastery learning that has reached a value of ≥76 and said to be completed classically if there are 85 % of students scored ≥76. Learning outcomes in knowledge competencies in grades VII-C and VII-D have increased, which can be seen from the results of the N-gain pretest and posttest that are included in the high criteria for grades VII-C and VII-D respectively 75% and 28.1 %, 25% and 71.9% in the medium category. Then the average value obtained in class VII-C is 88 while in class VII-D is 82.

However, there are large differences in the increase in learning outcomes between classes VII-C and VII-D, this is due to changes after learning using the STAD type cooperative model for global warming material. The use of this learning model is new to students, so it is interesting to use student learning. From Kristin's research (2016) The learning process that takes place using the STAD type cooperative learning model makes students feel happy in participating in learning in class. Students are more interested and motivated to learn. Besides the teacher is not as a subject of learning but as a facilitator who helps students who have difficulty in learning, motivating and facilitating students in learning. Based on the theory according to Vygotsky in Slavin (2011), the existence of collaborative activities with friends will be easier for students to understand a phenomenon, solve problems, remember and think. According to Good in Sukardi (2008) cognitive value is a process of knowledge that is more based on the development of perception, introspection or memory so that the test of learning outcomes is made to

consider the student's knowledge process that is connected with bloom's taxonomy.

According to Slavin in Rusman (2011) several factors that influence learning outcomes in the application of this learning model are students that make a substantial contribution to the group, active interaction and cooperation of good group members, have good learning responsibilities for themselves and help fellow group members for learning, there is appreciation from the teacher so students are more motivated to be active in learning. Therefore students who have applied STAD type cooperative learning models get mastery learning outcomes that can be categorized as high because these factors work well from the beginning of learning to the end of class learning according to the learning steps.

From Hidayati's research (2013) Learning that prioritizes the active role of students will make students' understanding of learning presented more clearly and personally meaningful, because students are trained to learn something new based on the understanding they already have and can find out the relationship of learning material with the environment, technology and society. In control class students who were given conventional learning the average cognitive learning outcomes were lower than the experimental class. From the research of Ngabdiningsih (2013) Conventional learning, teaching is still centered on the teacher so students tend to be passive and only receive information from the teacher with lecture and discussion methods that emphasize memorization of a concept. This is in accordance with the statement of Freire, 1999 (in Warpala, 2009) giving the term to such teaching as an implementation of "bank style" education (banking concept of education). The administration of education is only seen as an activity of providing information that must be "swallowed" by students, which must be remembered and memorized.

The learning process that emphasizes memorizing a concept makes knowledge less meaningful. In accordance with the statement of Rampengan (Trianto, 2007) that the accumulation of information / concepts on the subject of students may not be useful even at all if it is only communicated by the teacher to the subject of students in one direction such as pouring water into a glass.

**CONCLUSION & SUGGESTION**

The conclusion of this study is the completeness of learning outcomes by applying STAD type cooperative learning models can improve student learning outcomes. Based on the research that has been done, the suggestions submitted by researchers, student worksheet must be introduced first before practicum because there are some students having difficulty when filling out answers to the worksheet during the learning process.

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