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STAD and NHT Learning Application in Class VIII Social Science Subjects of SMP Negeri 1 Tompaso

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Abstract. This study aims to determine the differences between student learning outcomes taught by applying the STAD learning model and the NHT learning model in social science subjects, Class VIII. This research was conducted at SMP Negeri 1 Tompaso using an experimental method with two treatments and two experimental classes, one class using the STAD learning model and one class using the NHT learning model which was taken randomly. The variables in this study are: (i) student learning outcomes obtained using the STAD learning model (X_1) and (ii) student learning outcomes obtained using the NHT learning model (X_2). Data were analyzed with descriptive statistics followed by t-test mean difference. The results showed that the STAD and NHT learning models can (i) increase the average student learning outcomes, namely 84.46 for STAD and 85.00 for NHT and (ii) increase the percentage of students who have score to meet the MCC, namely 96.4 % for STAD and 92.90% for NHT. The average student learning outcomes are not significantly different between the STAD and NHT learning models. Both of these learning models are suitable for use in social science subjects of class VIII

Keywords. STAD learning; NHT learning; learning outcomes, social science subjects

1. Introduction

Law No. 20 of 2003, article 37 states that the curriculum for primary and secondary education must include social sciences. This means that every student is required to take social science subjects, before being declared to have passed the basic (SD/SMP and equivalent) and secondary (SMA and equivalent) levels of education.

Learning is the process of transferring knowledge and technology from teachers (educators) to students through the process of interaction between teachers and students, between students and students (Law Number 20 article 1 paragraph 20) ("Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System," 2003), both directly and indirectly, both in the classroom and outside the classroom by using information and communication technology. Through this learning, it is expected that students can improve their competencies, both attitudes, knowledge, and social skills as a whole. (Ministry of Education and Culture of the Republic of Indonesia (2017).

Social science learning at the junior high school level, especially at SMP Negeri 1 Tompaso, it was found that student learning outcomes did not meet expectations, both from students, teachers, and schools. This can be seen from the percentage of students who get scores

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that meet the minimum completeness criteria (MCC) in the semester exams for social science subjects, which are still around 70%. The problems, among others, are the limitations of teacher mastery in using learning models (Lempas, 2020).

Student learning outcomes were influenced by self-regulated learning (SRL), teachers' attitudes towards students and parents' attitudes towards children. Furthermore, SRL is influenced by parents' attitudes towards students and teachers' attitudes towards students (Yuzarion, 2017). Student learning outcomes were influenced by two factors, namely: (i) factors from within students, including intelligence, learning motivation, perseverance, self-confidence, habits, physical and psychological and (ii). the second factor is from outside the students, including teachers, parents, facilities and infrastructure, social environment, curriculum, assessment policies and learning models.

One of the learning models that can improve social science learning outcomes for junior high school students is the cooperative learning model. Cooperative learning is a program where students work in small groups to help each other to master the content of the lesson and are responsible not only for their own work but also for the work of their group members (Slavin in Singh and Agrawal, 2011). This learning model prioritizes a cooperative atmosphere by using various types of learning to improve students' understanding of the subjects matter (Balkcom, no date).

Cooperative learning is a learning model that is applied by teachers to achieve learning objectives in the classroom. Learning objectives are desired future states that demonstrate competence or mastery of the field of study being studied. To achieve this goal, the atmosphere or learning climate most of the time is to work together (Johnson and Johnson, 2009).

The student team achievement division (STAD) learning model is one type of cooperative learning developed by Robert Slavin. This learning model consists of a regular teaching cycle, cooperative learning in teams or small groups with various abilities, tests or quizzes, and other awards or recognitions given to teams whose members perform very well (Slavin, 2008). The STAD learning model is designed to provide opportunities for students to interact in groups and provide opportunities for relatively smarter students to become peer tutors and provide opportunities for students who are relatively less intelligent to listen.

Collaborative learning, especially STAD can improve learning outcomes and improve the attitudes of class XI students (Trisna Jayantika *et al.*, 2019). This is in line with the findings of class VIII students at SMP Negeri 1 Tompaso, that the use of the STAD Collaboration learning model can significantly improve student learning outcomes in social science subjects (Lempas, 2020).

The numbered heads together (NHT) learning model is part of cooperative learning developed by Spencer Kagan. This learning model is carefully designed to provide equal opportunities for students to participate, both in terms of time and number of questions (Kagan, n.y). The NHT learning model is designed (i) to form a pattern of student interaction that involves more students in reviewing the subjects matter covered in a subjects and (ii) to create a student learning atmosphere that gives students more opportunities to be creative in finding and processing information, making report and present it in front of the class (Trianto, 2010). This NHT learning model will give students more interaction and more opportunities for students to be creative in answering questions posed by the teacher related to the subjects matter.

This NHT cooperative learning model can improve the learning outcomes of junior high school students. The average learning outcomes of class VIII SMP students who apply the NHT cooperative learning model are better than the average learning outcomes of students who apply the conventional learning model (Sutriningsih, Pratiwi and Utami, 2018). The NHT

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cooperative learning model can be used as an alternative to improve student learning outcomes for other subjects, such as a.l. social science (Destiyandani, Yunianta and Mampouw, 2016). The results of Lempas research (2017) in Class VIII SMP at SMP Negeri 1 Tompaso concluded that the NHT cooperative learning model can significantly improve student learning outcomes in social science subjects (Lempas, 2017).

The application of the STAD and NHT cooperative learning models together in order to compare the learning outcomes of the two models or types, it can be shown that the class of students taught by applying the STAD cooperative learning model has an average value of student learning outcomes that is better than the class of students who are taught by applying the NHT cooperative learning model (Prasetyo and Sutriyono, 2006). Based on the results of this study, it is interesting to know whether the application of the STAD cooperative learning model gives results better learning from the application of the NHT cooperative learning model in social science subjects for Class VIII of SMP Negeri 1 Tompaso or in other words, is the application of the STAD learning model better than the application of the NHT learning model to social science subjects at SMP Negeri 1 Tompaso?

Based on these problems, this study aims to determine the difference between student learning outcomes that are taught by applying the STAD cooperative learning model and the NHT cooperative learning model in social science subjects, class VIII SMP Negeri 1 Tompaso.

This research is expected to be useful for (i) developing and expanding knowledge of the use of the STAD and NHT cooperative learning model, and (ii) as input and consideration for implementing the STAD and NHT cooperative learning model in junior high schools in order to obtain better learning outcomes for students.

2. Research Methods

This research was conducted at SMP Negeri 1 Tompaso for 6 months, from May to December 2019. This study used an experimental method with 2 (two) treatments and 2 (two) experimental classes. T_1 treatment, namely the use of the STAD cooperative learning model and T_2 treatment, namely the use of the NHT cooperative learning model. Class VIIIa, as the experimental class for the STAD learning model and class VIIIc, as the experimental class for the NHT learning model (Table 1). The material taught is the effect of changes in space on economic life (K13 Curriculum even semester VIII).

Table 1. Schematic of research design

Class	Number of students	Treatment	Post test
VIIIa	28	STAD	X_1
VIIIc	28	NHT	X_2
Quantity	56		

The research population is all class VIII students at SMP Negeri 1 Tompaso with a total of 84 students, who are members of 3 (three) classes, each class has 28 students. The class that became the sample in the study was taken randomly, namely class VIIIa for the STAD cooperative learning application and class VIIIc for the NHT cooperative learning application.

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STAD collaborative learning model steps: (i). the teacher forms 6 groups consisting of 4-5 students by paying attention to academic achievement, gender, origin of residence, (ii) the teacher presents the subjects matter, explains the lesson objectives to be achieved and the subjects to be studied, (iii) students work in groups , all members control and each provides support, (iv) the teacher evaluates learning outcomes through giving quizzes and giving an assessment of group presentations, and (v) the teacher gives awards to groups that excel (Slavin, 2008).

The steps of the NHT cooperative learning model are as follows: (i) the teacher forms 6 groups of 4-5 students and gives them a different number, (ii) the teacher takes the numbered questions that have been prepared and conveys the questions to the students. students, (iii) students work together to answer the questions, each student must know the answers to the questions, (iv) the teacher draws a number and all students have the same number in each group raises their hand, then the teacher reads the questions and the whole group prepares answers, (v) the teacher provides conclusions from all questions related to the material presented, and (vi) the teacher gives awards or appreciation to students and groups with better learning outcomes (Sharan, 2009).

In this study, the variables used consisted of two variables, namely: (i) student learning outcomes obtained by applying the STAD cooperative learning model denoted by X1, and (ii) student learning outcomes obtained by applying the NHT cooperative learning model denoted by X2 .

The collected data were analyzed using descriptive statistics followed by the t-mean difference test (Walpole, 1992):

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\left(\frac{1}{n_1}\right) + \left(\frac{1}{n_2}\right)}}$$

Description :
$\bar{x}_1$ = mean learning outcomes of STAD experimental class
$\bar{x}_2$ = mean learning outcomes of NHT experimental class
n_1 = number of students in STAD experimental class
n_2 = number of students in NHT experimental class
s = combined variance

3. Results and Discussion

SMP Negeri 1 Tompaso, Minahasa district, North Sulawesi province is an A-accredited school. The number of students is 248 students, consisting of 114 male students and 134 female students. Class VIII which became the research population amounted to 84 people, consisting of 37 male students and 47 female students, who were members of 3 (three) classes, namely class VIIIa, VIIIb and VIIIc. The sample classes in this study were class VIIIa and class VIIIc with 28 students each. Class VIIIa is an experimental class with the STAD cooperative learning model treatment and class VIIIc is an experimental class using the NHT cooperative learning model treatment. The subjects matter given to students is the same, namely the effect of changes in space on economic life.

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Student learning outcomes for social science subjects in the experimental class with the treatment of the STAD cooperative learning model and NHT collaboration in class VIII SMP Negeri 1 Tompaso, 2019 can be seen in Figure 1. Based on the figure, it can be shown that the distribution of student learning outcomes in the two experimental classes forms a curve normal with the same highest frequency, namely 15. The distribution of learning outcomes taught with the STAD learning model curve slightly to the left, where 7 students have higher learning outcomes than the mode and 10 students have lower learning outcomes than the mode. On the other hand, the distribution that was taught using the NHT learning model has a slightly skewed curve to the right, where 10 students have scores greater than the mode and 6 students have learning outcomes less than the mode.

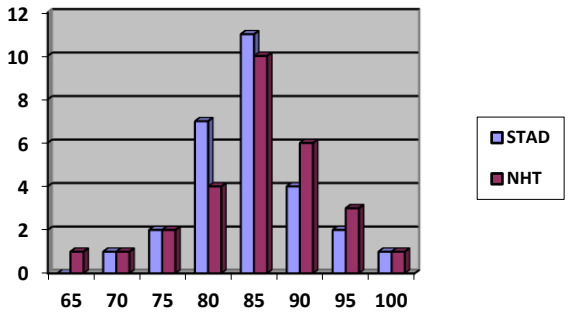

Figure 1.
Bar chart of the frequency distribution of social science student learning outcomes class VIII according to the STAD and NHT learning models

Student learning outcomes in the experimental class with the STAD cooperative learning model treatment can be shown that the highest score of student learning outcomes is 100 and the lowest score is 70 with the mode and median valuesof 85 and an average of 84.46. Meanwhile, for student learning outcomes in the experimental class with the NHT cooperative learning model treatment, the highest score was 100 and the lowest score was 65 with the mode and median equal to 85 and the average score was 85.00 (Table 2).

Table 2.Summary of student learning outcomes for class VIII SMP Negeri 1 Tompaso

Description	Learning Model	
	STAD (X1)	NHT (X2)
Modus	85	85
Median	85	85
Mean	84,46	85,00
Highest Value	100	100
Lowest Value	70	65
N	28	28

Source: Research Results, 2019

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Furthermore, based on the Minimum Completeness Criteria (MCC) where at SMP Negeri 1 Tompaso the MCC value for social science subjects class VIII is 72, it can be shown that the percentage of students who do not reach the MCC is 3.57% for classes taught with the STAD cooperative learning model and 7.14% for classes taught with the NHT cooperative learning model. Furthermore, the number of students who achieved the MCC who were taught the STAD cooperative learning model was 96.43% and 92.86% were taught the NHT cooperative learning model. Both of these models are good or suitable for social science learning. Even though the percentage of MCC achievement in the STAD cooperative learning model is better than the NHT cooperative learning model.

Furthermore, to prove statistically whether the STAD cooperative learning model is better than the NHT cooperative learning model, it is continued with statistical analysis of the t-mean difference test. The results of the analysis can be seen in Table 3. The results of the t-statistical test show that the average student learning outcomes using STAD cooperative learning (84.46) is not significantly different from the average student learning outcomes using NHT cooperative learning (85.00). This is evidenced by the t calculated value = 1.4953 while the t table value at the 99 percent confidence level with 54 degrees of freedom ($t_{(0.01;\ 54)}$) = 2.015. In other words, student learning outcomes between the experimental class with the STAD cooperative learning model treatment and the experimental class with the NHT cooperative learning model treatment gave the same learning outcomes for class VIII students of SMP Negeri 1 Tompaso for social science subjects.

Table. 3. Statistical Analysis Results

Source of Variation	Learning Model		$t_{(calculate)}$	$t_{(0.05:54)}$
	STAD	NHT		
Mean	84,46	85,00	1,495	2,015
Variance	41,369	59,259		
Standard Deviation	6,432	7,698		
Combined Varians	50,314			

The distribution of student learning outcomes in social science subjects at SMP Class VIII who received the NHT cooperative learning model was more varied or wider than the average student achievement who received the STAD cooperative learning model. This is because in the STAD cooperative learning model, smart students will become peer tutors and are more dominant in answering all assignments given to the group, while students who are less intelligent just take notes so they have time to master the material being studied. In the NHT cooperative learning model, smart students also help less intelligent students in groups, but the material is more limited to the number of questions from the student concerned, while mastery of material on other numbers is reduced (students are more focused on mastering the number of questions). Besides the influence of the learning model, it is also influenced by the intelligence ability and motivation of each student. Differences in intelligence and student motivation cause differences in learning outcomes.

The average student learning outcomes that did not differ between the STAD collaborative learning model and the NHT Collaboration learning model provided evidence that these two methods both improved student learning outcomes. Both of these methods have also been empirically proven by Lempas in his different research in class VIII of SMP Negeri 1

Tompaso. (Lempas, 2017) (Lempas, 2020). This means that the STAD learning model and NHT learning model have advantages in increasing the average student achievement for Social Science subjects for Class VIII.

These two learning models describe the role as well as the attitude of the teacher in creating self-regulated learning (SRL) which in the end SRL is able to improve student learning achievement. This means that with this learning model students are able to interact with fellow students and teachers, participate actively and have the motivation to know the subjects matter (Yuzarion, 2017).

Several things need attention regarding the use of the STAD cooperative learning model in learning activities, teachers need to be careful in choosing or assigning existing teams or groups. Precision and accuracy in dividing teams or small groups will support the effectiveness of the learning activities carried out (Trisna Jayantika *et al.*, 2019) (Istianti, Dewi K and Sulasmono, 2013). The division of heterogeneous groups in terms of student abilities has made the relationship in the group closer. This relationship raises self-confidence, especially from weak students. Students who have more ability can become peer tutors for their group mates and students who have less ability feel that someone is helping them when there is subjects matter that is not yet understood. Therefore, the formation of groups should begin with determining the ranking (superior). With varied group membership, it will enable them to motivate each other and work together in groups according to their respective roles. Failure to form a group can result in disproportionate group abilities causing relatively weak groups to lack peer tutors and lack motivation to earn awards or prizes as winners.

STAD cooperative learning model and NHT collaboration are forms of cooperative learning to achieve learning objectives. Both of these learning models provide opportunities for smart students to teach other students in the group, smart students become tutors for students who are less intelligent or less. With this group, students learn to discuss, express opinions and listen to their friends in the group. Through groups they learn to determine discussion leaders, learn to lead, learn to be led, and learn to appreciate differences. These attitudes and social skills are important for the provision of students in the future. However, students with relatively better abilities are needed in groups. Even though the dominance of students who are relatively smarter is still found in group discussions and class discussions.

In presenting the results there are differences between the STAD cooperative learning model and the NHT collaboration. In the NHT cooperative learning model, all students are ready to answer questions when the teacher asks questions according to the student's number. Therefore, each student works hard to master the material. Students who feel weak ask their group mates to answer certain questions and then try to master it so that when the number is called the person concerned may answer or explain it properly and correctly. While in the STAD cooperative learning model, the group spokesperson is more responsible for the questions. In other words, in the NHT group, all students have the same opportunity to provide answers to questions.

In the presentation and group discussion, these two learning models showed a pleasant atmosphere, even though in class discussions were still more dominated by students who were classified as smart in class. Therefore, it is very important to agree on the time given to each student to express their opinions or responses when the number of questions is asked in the NHT cooperative learning model and the teacher's role as facilitator and moderator is very important to arrange in such a way that the dominance of smart students can be reduced in the model. STAD collaborative learning.

Giving prizes to those who excel will increase the motivation of the group and group members, both in the STAD cooperative learning model and the NHT cooperative learning model. Because each group and member tries and works hard to do the best possible job given to them in order to be the best and get recognition and appreciation.

The teacher's role is very important for the successful implementation of the STAD cooperative learning model and the NHT collaboration. Teachers must act as motivators, evaluators and class facilitators (Destiyandani, Yunianta and Mampouw, 2016). The teacher's ability to create a pleasant atmosphere will help students work together. A pleasant learning atmosphere will make it easier for students to work together, help each other, respect each other in groups. Each tries to complete the group task and plays himself to be able to participate more actively.

The STAD cooperative learning model and the NHK collaboration require the role of the teacher and the active participation of students, both in groups and in the classroom as well as good interaction between teachers and students in a pleasant cooperative atmosphere. In such relationships and conditions, students become more active, and motivated in the learning process so that students' cognitive abilities, attitudes and skills (learning achievement) can be improved.

4. Conclusion

The average student learning outcomes in Social Science subjects for Class VIII taught using the STAD cooperative learning model (84.46) is not significantly different from the average student learning outcomes using the NHT collaborative learning model (85.00). t arithmetic = 1.4953 > (t(0.05; 54)) = 2.015. This means that the use of the STAD cooperative learning model and the NHT cooperative learning model can both increase the average student learning outcomes for Social Science subjects for Class VIII of SMP Negeri 1 Tompaso.

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