



# The Influence Of TGT And NHT Cooperative Learning On Improving Science Learning Outcomes Of Elementary Students

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## Articles Information

## Abstrak

### Keywords:

Cooperative Learning;  
Numbered Head Together;  
Teams-Games Tournament;  
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Penelitian ini bertujuan untuk memperoleh data tentang pengaruh model cooperative learning type TGT (Teams-Games Tournament) dan NHT (Numbered Head Together) terhadap peningkatan hasil belajar IPA siswa kelas V. Penelitian ini dilakukan pada siswa yang terdaftar sebagai siswa pada Tahun Pelajaran 2022/2023. Penelitian ini dilaksanakan bulan Oktober sampai dengan Desember 2022. Metode penelitian yang digunakan dalam penelitian ini adalah metode kuantitatif dengan pendekatan uji beda (uji-t). Jumlah populasi 396 dan sampel sebanyak 58 siswa yang diperoleh secara acak. Instrumen yang digunakan adalah tes berupa pilihan ganda dengan pilihan jawaban a, b, c, dan d. Berdasarkan hasil uji hipotesis Kelompok eksperimen 1 dan kelompok eksperimen 2, diperoleh thitung = 3,749, kemudian diperoleh tabel dengan hasil = 1,997. Dengan demikian dapat dinyatakan bahwa terdapat pengaruh positif antara variabel model pembelajaran cooperative learning type TGT (Teams-Games Tournament) dan NHT (Numbered Head Together) dan variabel hasil belajar IPA. Dengan demikian kesimpulan penelitian ini adalah terdapat pengaruh model pembelajaran kelompok type TGT (Teams-Games Tournament) dan NHT (Numbered Head Together) terhadap hasil belajar siswa kelas V di Gugus III Kecamatan MuaraGembong Bekasi.

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## Abstract

This study aims to obtain data on the effect of the TGT (Teams-Games Tournament) and NHT (Numbered Head Together) cooperative learning models on improving science learning outcomes for fifth grade students. This research was conducted on students who were registered as students in the 2022/2023 Academic Year. This research was conducted from October to December 2022. The research method used in this study is a quantitative method with a (t-test). The total population 396 and sample of 58 students obtained randomly. The instrument used is a multiple choice test with answer choices a, b, c, and d. Based on the results of the hypothesis testing of the experimental 1 group and the experimental 2 group, tcount = 3.749 was obtained, then table was obtained with a result = 1.997. Thus it can be stated that there is a positive influence between the variables of cooperative learning type TGT (Teams-Games Tournament) and NHT (Numbered Head Together) learning models and the variables of science learning outcomes. Thus the conclusion of this study is that there is an influence of the TGT (Teams-Games Tournament) and NHT (Numbered Head Together) type group learning models on the learning outcomes of class V students in Gugus III MuaraGembong Bekasi District.



## INTRODUCTION

The education system in Indonesia is more directed towards a mass and classical learning model. Education should be able to develop the intelligence and talents possessed by students optimally so that students can develop their potential into an achievement that has selling value. Because of this, an education model is needed that is not only able to make students intelligent in theoretical science (theory of science), but also intelligent practical science (practice of science). As a teacher, education is a component of professional personnel tasked with designing and implementing the KBM process, required to have creativity to support learning. Able to strategize in innovating in managing education from the heart without coercion, logical and fun and combining with a personal-emotional approach, education becomes a means to open the mindset of students that the knowledge they learn has meaning in life so that knowledge is able to change the attitudes, knowledge and skills of students towards the better.

In general, so far the learning model used by teachers still uses a conventional approach, namely in the form of lecture methods (expository) or only questions and answers. This certainly causes education and mastery of the material taught to be less than optimal because students are less active in the learning process, only as good listeners. Because the teacher provides lessons based on textbooks only, students are passive only as recipients of knowledge by listening, recording and memorizing texts, sometimes students only remember when the lesson is in progress, or in a fairly short period of time. This will have an impact on the mastery of the material taught by the teacher is not maximally absorbed which will affect the learning outcomes of students. Rusmono (2017) states that learning outcomes are changes in individual behavior which include cognitive, affective and psychomotor domains. these changes in behavior are obtained by students after students complete their learning program through interaction with various learning resources and learning environments facilitated by the teacher.

One of the low learning outcomes is shown from the data on the value of Class V obtained from the results of the final semester test (PAS) in science lessons in one of the Gugus III Muaragembong District, namely at SDN Pantai Bakti 03, reaching 87% of students have not reached the KKM. Based on the semester test scores, students' learning outcomes are still far from the classical learning completeness standards determined in the 2013 curriculum. In addition, the PISA ranking in 2018 (Ministry of Education and Culture, 24/04/2022) in the field of SCIENCE the score is only 396 or in position 71 is very low. Based on these findings, of course, the right learning method or strategy is needed to explore the potential of students and involve students actively in the learning process. In addition, teachers must strive to create a conducive learning climate through the implementation of various learning models that are fun, interesting and make students more active. For example, by playing games in groups to complete the tasks given by the teacher. So that the lessons taught by the teacher can be absorbed by students optimally and have an impact on improved learning outcomes. Especially in the 21st century this has brought many changes in terms of technology and regarding the rapidly growing education paradigm, as a teacher educator is the spearhead of the changes that exist in education itself, there needs to be innovation in the methods used in

the learning process. Teachers as driving agents in the learning process must be able to explore and visualize a variety of new learning models that are different from what has been done (conventional) "think outside the box". Teachers must continue to learn to equip themselves in order to keep pace with the rapid development of science, and prepare quality students who are able to compete in the future.

Learning principles include personal skills, social skills and academic skills (Depdiknas, 2003). One of the learning models used to develop social skills is the cooperative learning model. This learning model was developed to achieve three important objectives, including academic achievement, tolerance and acceptance of diversity, and the development of social skills. This cooperative learning model demands learner cooperation and student interdependence in task structure, goal structure and reward structure. To overcome the problems from the findings presented previously in learning, teachers must make innovations during the learning process that are fun, namely by learning while playing so that students can easily accept the material taught by the teacher. To optimize the quality of KBM in the classroom, learning models that can be applied are TGT (Teams- Games Tournament) and NHT (Numbered Head Together) cooperative learning models.

Hamdani (2011) states that TGT type cooperative learning is one of the cooperative learning models that is easy to implement, involves the activities of all students without status differences and contains elements of games and reinforcement. It means learning while playing. In TGT, students are formed in small groups of three to five heterogeneous students, conducting academic tournaments for students to compete as representatives of their teams against other team members. Anita Lie (Inna Naiza, 2013) said that the NHT (Numbered Heads Together) Learning model is a cooperative teaching model with a structural approach that provides opportunities for students to share ideas and consider the most appropriate answers. The NHT learning model also encourages students to increase their spirit of cooperation.

The existence of the "Merdeka Belajar" program and the adaptation period for new habits after the pandemic certainly support educators to make innovations and new strategies in the use of learning methods that can encourage students to be more enthusiastic about learning so that the impact of learning loss can be avoided and learning outcomes can improve. One of the causes of the decline in student learning outcomes is that teachers still use learning models with methods that can only be applied conventionally such as lectures, or monotonous methods without the help of supporting media carried out in science subjects. Meanwhile, the selection of learning models must pay attention to student conditions, and be varied to improve students and their teachers. Students are only required to receive material and know something, not demanding students to do something or know more deeply or play an active role about science material. through the TGT (Teams-Games Tournament) type learning model based on games in learning, and NHT (Numbered Head Together). In this learning model, the teacher acts as a facilitator to motivate as well as monitor the activeness of students in group discussions. Students need tools or media to support the game, namely by using TTS (crossword puzzle) media.

In learning, it is necessary to use educational and interactive media that will attract students' enthusiasm in learning. Media is one of the tools that can convey information to students more interestingly. One of the media used in the form of games is TTS (Crossword) media, this TTS media is used to increase students' enthusiasm in learning, because playing while learning will make students more active in interacting with their friends to complete the TTS game.

Based on the description above, the effect of the cooperative learning model type TGT (Teams-Games Tournament) and NHT (Numbered Head Together) accompanied by TTS media can solve the obstacles in the implementation of student learning, which is less active in following the lessons given by the teacher. The classroom atmosphere also looks less conducive due to the lack of readiness and enthusiasm of students in participating in the learning process and the less than optimal learning outcomes of science lessons. Thus this study is expected to find out and be interested in conducting research on "THE EFFECT OF THE COOPERATIVE LEARNING MODEL TIPE TGT (TEAMS-GAMES TOURNAMENT) AND NHT (NUMBERED HEAD TOGETHER) ON THE IMPROVEMENT OF STUDENTS' SCIENCE LEARNING RESULTS".

## METHOD

This quantitative research uses a quasi-experimental method in which the subjects selected are all subjects in the intact group. The method is used on the basis of the objectives to be achieved, which intends to find out about the effect of the TGT (Teams-Games Tournament) type cooperative learning model and the NHT (Numbered Head Together) type cooperative learning model on improving science learning outcomes. The research design used in this study is Matching Pretest-Posttest Control Group Design. In this study there were three research variables, consisting of two independent variables, and one dependent variable. The first independent variable (X1) is the TGT (Teams-Games Tournament) type cooperative learning model, the second independent variable (X2), is the NHT (Numbered Head Together) type cooperative learning model, while the dependent variable (Y) is the improvement of learning outcomes in science subjects of grade V elementary school.

In this study, researchers gave treatment to two groups as research samples, namely group 1 which was treated with the TGT (Teams-Games Tournament) type cooperative learning model and TTS media while group 2 was treated with the NHT (Numbered Head Together) type cooperative learning model and TTS media. The design of this study can be seen in Table 1.

**Tabel 1.** Desain Penelitian Desain Matching Pretest-Posttest Control Group Design

Group	Pre-test	Treatment	Post-test
KE 1	0 <sub>1</sub>	X <sub>1</sub>	0 <sub>2</sub>
KE 2	0 <sub>1</sub>	X <sub>2</sub>	0 <sub>2</sub>

The target population for generalizing the findings of this experiment is all fifth grade students of public elementary schools in Bekasi Regency, especially in cluster III of Muaragembong District, Bekasi

Regency. Meanwhile, the samples used in this study were fifth grade students of SD Negeri Pantai Bakti 01 and fifth grade students of SD Negeri Pantai Bakti 03. Based on the population data in the study, it was declared homogeneous, so the type of sample used was a simple random sample. The sampling procedure by identifying all grade IV & V students in Gugus III as listed in Table 2.

**Table 2.** Participant demographics

No	Schools Name	Fourth Grade	Fifth Grade	Total
1.	SDN Pantai Bakti 01	31	32	63
2.	SDN Pantai Bakti 02	14	9	23
3.	SDN Pantai Bakti 03	20	26	46
4.	SDN Pantai Mekar 01	50	44	94
5.	SDN Pantai Mekar 02	50	42	92
6.	SDN Pantai Mekar 03	40	38	78
<b>Total</b>				396

There are 2 kinds of instruments used in this study, namely tests and non-tests. A good test instrument must meet two requirements, namely valid and reliable (Arikunto, 2010: 211). In addition, it is necessary to pay attention to several criteria that must be met, namely validity, reliability, distinguishing power, and difficulty index of the test instrument. The test instrument test in this study used the SPSS application to test validity and reliability, while to test the level of difficulty using Anates Uraian version 4.0.5. In this study, the questionnaire used is a Likert scale questionnaire in the form of closed questions so that respondents only need to choose the appropriate answer. This questionnaire consists of 5 answer choices, namely: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. The questionnaire was filled in before students received learning with conventional learning models and TGT learning models. Data analysis conducted to answer the hypotheses in this study is to use Two-Way Analysis of Variance (Two-Way ANOVA) with Matching Pretest-Posttest Control Group Design.

## RESULT AND DISCUSSION

### Teams-Games Tournament Cooperative Learning

Teams-Games Tournament (TGT) is a cooperative learning strategy that encourages students to work together in small groups to achieve academic goals while also promoting friendly competition. TGT is designed to foster collaboration, engagement and active participation among students. In TGT, students are divided into small, heterogeneous teams of four to six members. Each team works together to understand and learn the material together, by encouraging discussion, explanation, and peer learning. After the team study phase, each student takes an individual quiz or test that measures their understanding of the material learned with the team. A competition is then conducted between teams based on individual quiz results, with the aim of encouraging active engagement and motivation among students. The advantages of TGT include cooperative learning, active engagement, individual accountability, differentiation, social interaction, and better understanding and retention of material. Effective implementation of TGT can be

influenced by various factors including classroom dynamics, student engagement, and the teacher's ability to implement this strategy.

### Pre-test Data

**Table 3.** Pre-test data description

Group Data	N	Mean	Median	Modus	S	S <sup>2</sup>	Min.	Max.
Experiment	32	44.91	45.00	37.00	8.82	77.00	28	65

Based on the maximum and minimum scores from table 3, the score range is 37, the class interval is 7 and the number of classes is 6. With this data, a frequency distribution table of the effect of the cooperative learning model on science learning outcomes in elementary schools can be made, as in Table 4.

**Table 4.** Frequency distribution of pre-test results

Interval Class	Lower	Upper	Absolute Frequency	Relative Frequency
28 – 34	27.5	34.5	3	9.4%
35 – 41	34.5	41.5	9	28.1%
42 – 48	41.5	48.5	9	28.1%
49 – 55	48.5	55.5	8	25.0%
56 – 62	55.5	62.5	2	6.3%
63 – 69	62.5	69.5	1	3.1%

Based on the table 4, it can be seen that the number of students who are above the class average is 11 people (34.4%), those in the average class are 9 people (28.1%) and students who are below the class average are 12 people (37.5%).

### Post-test Data

Based on the results of research on the effect of cooperative learning models on science learning outcomes in elementary schools after treatment, the data collected obtained the highest score of 86 and the lowest score of 58, an average value of 73.78 with a standard deviation of 7.85 and a variance of 61.66 The median value is 75 and the mode is 75.

**Table 5.** Post-test data description

Group Data	N	Mean	Median	Modus	S	S <sup>2</sup>	Min.	Max.
Experiment	32	73.78	75.00	75.00	7.85	61.65	58	86

Based on the maximum and minimum scores from table 5, the score range is 28, the class interval is 6 and the number of classes is 7. With this data, a frequency distribution table of the effect of the cooperative learning model on science learning outcomes in elementary schools can be made, as in Table 6.

**Table 6.** Frequency distribution of post-test results

Interval Class	Lower	Upper	Absolute Frequency	Relative Frequency
58 – 62	57.5	62.5	5	15.6%
63 – 67	62.5	67.5	2	6.3%

68 – 72	67.5	72.5	2	6.3%
73 – 77	72.5	77.5	12	37.5%
78 – 82	77.5	82.5	7	21.9%
83 – 87	82.5	87.5	4	12.5%

Based on table 6, it can be seen that the number of students who are above the average class is 11 people (34.4%), those in the average class are 12 people (37.5%) and students who are below the average class are 9 people (28.1%).

### Numbered Head Together Cooperative Learning

Numbered Heads Together (NHT) is a cooperative learning approach that aims to encourage active participation and collaboration in the learning process. In NHT, each student in the group is assigned a number. After the subject matter is presented by the teacher, students work together in groups to ensure deep understanding. When the teacher asks a question or task, students work together in groups to find the correct answer or solution. Afterward, a group member will be randomly selected to answer the question or present the results of the discussion. This approach values collaboration and ensures that every group member is actively involved, while also building individual responsibility. NHT helps students develop critical thinking, effective communication, and teamwork skills, while also improving their understanding of the subject matter.

### Pre-test Data

Based on the pretest results of research on the effect of NHT learning on science learning outcomes in elementary schools, the data collected obtained the highest score of 56 and the lowest score of 30, the average value of 42.08 with a standard deviation of 9.32 and a variance of 86.95. The median value is 40.00 and the mode is 40.00. Calculation of Mean, Variance and Standard Deviation of NHT Model Learning Outcome Data before treatment The following data is explained through table 7.

**Table 7.** Pre-test data description

Group Data	N	Mean	Median	Modus	S	S <sup>2</sup>	Min.	Max.
Experiment	32	42.08	40.00	40.00	9.32	86.92	30	56

Based on the maximum and minimum scores from table 7, the score range is 26, the class interval is 5 and the number of classes is 6. With this data, a frequency distribution table of the effect of NHT learning on science learning outcomes in elementary schools can be made, as in Table 8.

**Table 8.** Frequency distribution of pre-test results

Interval Class	Lower	Upper	Absolute Frequency	Relative Frequency
58 – 62	57.5	62.5	5	15.6%
63 – 67	62.5	67.5	2	6.3%
68 – 72	67.5	72.5	2	6.3%
73 – 77	72.5	77.5	12	37.5%
78 – 82	77.5	82.5	7	21.9%

83 – 87	82.5	87.5	4	12.5%
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Based on table 8, it can be seen that the number of students who are above the average class is 11 people (42.3%), those in the average class are 5 people (19.2%) and students who are below the average class are 10 people (38.4%).

### **Post-test Data**

Based on the posttest results of research on the effect of NHT learning on science learning outcomes in elementary schools, the data collected obtained the highest score of 78 and the lowest score of 40, the average value of 62.81 with a standard deviation of 8.80 and a variance of 77.44. The median value is 63.5 and the mode is 65.00. Table 9 shows the description data.

**Table 9.** Post-test data description

Group Data	N	Mean	Median	Modus	S	S <sup>2</sup>	Min.	Max.
Experiment	26	62.81	63.50	65.00	8.80	77.44	40	78

Based on the maximum and minimum scores from table 9, the score range is 38, the class interval is 6 and the number of classes is 7. With this data, a frequency distribution table of the effect of NHT learning on science learning outcomes in elementary schools can be made, as in Table 10.

**Table 10.** Frequency distribution of post-test results

Interval Class	Lower	Upper	Absolute Frequency	Relative Frequency
40 – 46	39.5	46.5	1	3.8%
47 – 53	46.5	53.5	2	7.7%
54 – 60	53.5	60.5	9	34.6%
61 – 67	60.5	67.5	7	26.9%
68 – 74	67.5	74.5	4	15.4%
75 – 81	74.5	81.5	3	11.5%

Based on table 10, it can be seen that the number of students who are above the average class is 7 people (26.9%), those in the average class are 7 people (26.9%) and students who are below the average class are 12 people (46.2%).

### **Hypothesis Test**

#### **Normality test**

Normality test is a statistical procedure used to test whether a sample of data comes from a normal distribution or not. The normal distribution, also known as the Gaussian distribution, is a probability distribution that is symmetrical and follows a bell pattern. The results of the normality test calculations for the four research groups can be summarized in table 11.



**Table 11.** Normality Test Results

No.	Group	$L_{count}$	$L_{table}$	Information
1	K1	0.095	0.157	Normal
2	K2	0.132	0.157	Normal
3	K3	0.127	0.174	Normal
4	K4	0.141	0.174	Normal

Based on the table 11, it appears that all groups are normally distributed. So it can be continued for hypothesis testing.

### **Homogeneity Test**

Homogeneity test is a statistical tool used to evaluate whether the variation of several groups of data is homogeneous or balanced. In this context, homogeneity refers to the similarity or non-significant difference of the variability between the groups. Homogeneity tests are often used before conducting statistical analysis. Table 12 shows the results of the homogeneity test.

**Table 12.** Summary of test for homogeneity of population variance

Group	Variance $S^2$	Combined Variance $S^2$	Price B	$\chi^2_{count}$	$\chi^2_{table}$	Information
A1	77.77	75.29	210.19	0.878	7.81	Homogen
A2	61.66					
A3	86.95					
A4	77.44					

Based on table 12,  $\chi^2_{count} = 0.878$ , while  $\chi^2 (0.095;3) = 7.81$ . If compared, then  $\chi^2_{count}$  is smaller than  $\chi^2_{table}$  or  $0.878 < 7.81$ . This means that  $H_0$  is accepted. If associated with the acceptance criteria, then  $H_0$  is accepted. Thus, the four groups of data come from a homogeneous population.

### **T-Test**

The t-test, also known as the Student's t-test, is one of the important and commonly used statistical tools for comparing two sample means. The main purpose of the t-test is to assess whether the difference between two groups of mean data is statistically significant or just the result of chance. The t-test involves comparing the difference between the means of two groups with the variability within each group as well as the sample size.

Based on the results of research and statistical calculations using the t test at  $\alpha = 0.05$ , the tcount price of 3.749 is greater than the t table 1.997. This shows that the null hypothesis is rejected so that  $H_1$  is accepted, which means that there is an effect of the use of learning models on the science learning outcomes of grade V students in Gugus III Muara Gembong District.

The above results occur because the selection of the right learning model will be able to improve student learning outcomes. The learning model that can affect science learning outcomes in this study is the TGT and NHT type cooperative learning models. TGT type cooperative learning model is one of the

cooperative learning models that emphasizes games in completing tasks in groups, and representatives of the group will compete/tournament with other groups to get the highest score and get rewards. Because it emphasizes games in learning, the atmosphere of science learning becomes more fun so that students will more easily accept science learning and will produce better learning.

In contrast to students who use the NHT learning strategy. The NHT learning strategy is basically a variant of technical group discussions, its implementation is almost the same as group discussions, students sit in groups and each group member is given a number. After that the teacher calls the number randomly to present the results of the discussion.

The results of this study are in line with the results of research conducted by Lestariningsih (2019) whose research results concluded that TGT learning has a significant effect on learning outcomes and students' creative thinking as shown through statistical results using the one way anova test. Rochimah, (2019), in her research also concluded that the TGT type based on TTS educational games was effective in Indonesian language lessons for grade IV SD. Wikoyati, M.R., Maryadi, M., & Wijayanti, A. (2018). the results of his research also concluded that the TGT type based on TTS educational games was effectively used in fifth grade science lessons.

The results of this study are in accordance with the results of research conducted by Sahrul (2021) that the t-scheffe test resulted in T Count = 14.71204, which is greater than T Table = 1.98525 with db = 95 at the significance level  $\alpha = 0.05$ . So through these calculations, Ho is rejected and H1 is acceptable.

## CONCLUSION

Based on the results and discussions that have been carried out in this study, regarding the effect of the TGT (Teams games Tournament) and NHT (Numbered Head Together) type of cooperative learning model in improving the science learning outcomes of fifth grade elementary school students in Gugus III Muaragembong District, it can be concluded that there is a significant effect of using the TGT and NHT learning models in improving students' science learning outcomes. In addition, there is also a significant difference between the TGT and NHT learning models on improving the science learning outcomes of fifth grade students.

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