

**COMPARISON OF PHYSICS LEARNING OUTCOMES OF  
PHASE E STUDENTS GLOBAL WARMING MATERIAL  
BETWEEN GROUPS COOPERATIVE MODEL TYPE TGT  
WITH NHT ASSISTED BY WORDWALL**



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UNIVERSITAS NEGERI PADANG  
2024**

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**THESIS**

*Filed as one of the requirements to obtain a Bachelor of Education degree*



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## ABSTRACT

**Faizatul Diani : Comparison Of Physics Learning Outcomes Of Phase E Students Global Warming Material Between Groups Cooperative Model Type TGT With NHT Assisted By Wordwall**

This research is motivated by the low physics learning outcomes of Class X students of SMAN 1 Tanjung Mutiara and also teachers have not used the right learning model to support student physics learning outcomes. The purpose of this study is to find out the comparison of physics learning outcomes of class X students of SMAN 1 Tanjung Mutiara who are taught using the TGT model with Wordwall-assisted NHT.

This research includes quantitative research with a type of quasi-experiment (Quasi Experiment) with a non-equivalent control group design. The population of this study is all students of class X of SMAN 1 Tanjung Mutiara registered in the 2023/2024 school year with the research sample being classes X 1 and X 2. The determination of the sample in this study uses the purposive cluster sampling technique. The instruments used in this study are observation sheets for the implementation of the learning model, observation sheets for affective assessments and multiple-choice tests. The data analysis techniques used are normality test, homogeneity test, and hypothesis test.

Based on the results of the data analysis that has been carried out, the following results were found: First, the level of implementation of TGT and NHT is high, TGT is 83% and NHT is 80%. Second, there was an increase in students' physics learning outcomes in both experimental classes. Third, the physics learning outcomes of the TGT group are higher than those of NHT. The average posttest TGT was 82.67 and NHT 75.20. The results of the t-test at the level of 5% definition show  $t_{count} = 2.10 > t_{table} = 2.00$ . Based on the findings of the study, it can be concluded that the Wordwall-assisted TGT-type cooperative model is better in improving physics learning outcomes compared to the Wordwall-assisted NHT-type cooperative model.

Keywords: TGT Type Cooperative Model, NHT, Learning Outcomes, Wordwall.

## FOREWORD

Praise and gratitude to Allah SWT who has given His grace and grace so that the author can complete this thesis. As the title of the thesis, namely **“Comparison Of Physics Learning Outcomes Of Phase E Students Global Warming Material Between Groups Cooperative Model Type TGT With NHT Assisted By Wordwall”**. Prayers and greetings may always be poured out to the Prophet Muhammad SAW who has brought mankind to the age of cognitive like today.

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Padang, Agustus 2024

Writer

## PRESENTATION PAGE

With full gratitude, the author of this thesis dedicates to:

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## **CHAPTER I INTRODUCTION**

### **A. Background**

PISA (Programme For International Student Assessment) is an international student assessment program organized by the Organization For Economic Co-operation and Development (OECD) which aims to encourage countries to learn from each other's experiences in building better school systems and inclusivity. PISA is held every three years and Indonesia has participated in eight rounds of PISA since 2000. The PISA Indonesia respondents have represented 15-year-old students in grades 7–12. This assessment system tries to answer how well students are able to apply what they have learned in school in daily life such as science skills, reading skills, and math skills. Based on data published by the OECD in the 2022 period, there has been a decline in international learning outcomes due to the pandemic. For international reading literacy, the average decreased by 18 points compared to the results of PISA 2018, while Indonesia experienced a decrease in score by 12 points. Skor literasi matematika internasional di PISA 2022 rata-rata turun 21 poin. Indonesia's score decreased by 13 points compared to the results of PISA 2018. And for science literacy, Indonesia's score decreased by 13 points compared to the results of PISA 2018, almost equivalent to the international average which fell by 12 points. Based on the results of PISA for the 2022 period, it can be seen that there is still a decline in

Indonesia's PISA results, especially in the field of mathematics and science literacy, which decreased by 13 points compared to 2018.

The low science scores of students in Indonesia are also seen in the results of the National Examination (UN) score data. The National Exam is an evaluation system to measure the achievement of graduate competencies in certain subject fields held nationally. Based on the report on the results of the National Examination (UN) data issued by the Ministry of Education and Culture in 2019, for the high school level (IPA) the average score of Indonesian is 69.69, the average score of English is 53.58, the average score of mathematics is 39.33, the average score of physics is 46.47, the average score of chemistry is 50.99 and the average score of biology is 50.61. Data from the results of the 2019 high school national exam (IPA) shows that the average score of students in the field of science looks lower when compared to the average score of students in the field of languages, such as Indonesian and English. Among the fields of science (Mathematics, Physics, Chemistry and Biology) there are 2 subject rankings with the lowest average scores, namely Mathematics and Physics.

The low learning outcomes of students in Physics have occurred in a number of secondary schools in Indonesia, one of which is at SMAN 1 Tanjung Mutiara. Based on the data of the student learning outcome assessment report carried out on all grade X students of SMAN 1 Tanjung Mutiara, it shows that student learning outcomes are still low. The low learning outcomes of students in Physics have occurred in a number of

secondary schools in Indonesia, one of which is at SMAN 1 Tanjung Mutiara. Based on the data of the student learning outcome assessment report carried out on all grade X students of SMAN 1 Tanjung Mutiara, it shows that student learning outcomes are still low.

Table 1. Summative data at the end of the semester for class X students TP 2023/2024

Kelas	Nilai Rata-Rata STS
X 1	50,29
X 2	49,13
X 3	48,27
X 4	38,96
X 5	49,90
X 6	43,48
X 7	31,46
X 8	38,18
X 9	30,96
X 10	24,61

Source : (SAS Score Transcript Data for Physics Subject SMAN 1 Tanjung Mutiara)

From the data above, it can be seen that the physics learning outcomes of class X students of SMAN 1 Tanjung Mutiara are still low. This can be seen from the acquisition of summative learning outcome data at the end of the semester which shows that there are still many students whose scores have not met the Learning Goal Achievement Criteria (KKTP) as set by SMAN 1 Tanjung Mutiara, which is 75. Based on the data above, it can be seen that class X 1 is the class with the highest learning outcome score with an average Summative score at the end of the semester of 50.29. Meanwhile, class X 10 is the class with the lowest learning outcomes, namely with a summative average

score at the end of the semester of 24.61. This illustrates that students still have difficulties in learning Physics.

Based on the results of observations made during the Field Experience Program (PPL) at SMAN 1 Tanjung Mutiara and based on interviews and document studies that have been conducted, several possible causes of low student physics learning outcomes at SMAN 1 Tanjung Mutiara were obtained, including the effects of learning during the Covid-19 pandemic. The outbreak of the Covid-19 pandemic has changed the way education is organized in Indonesia. Along with these changes, the implementation of health protocols in schools has become a must to protect the health of students and educators. The government's policy to implement online learning is a solution to reduce the risk of spreading the virus and maintain the continuity of the learning process.

Online learning is a learning process that is carried out in and with the help of the internet network (Belawati, 2019). Online learning utilizes digital technology to deliver learning materials, facilitate interaction between teachers and students, and support virtual learning activities. In online learning, students can access various types of materials, such as text, images, audio, and videos presented through digital platforms. Although the interaction between students and teachers is not direct, the digital platforms used in online learning can facilitate communication and collaboration virtually. Communication and collaboration can be done through discussion forums, chats, video conferences, and social media.

The implementation of online learning in schools is not fully effective. There are several obstacles that make online learning in schools ineffective. To be able to take part in online learning, an adequate device is needed and a good internet connection is required. This is of course the main obstacle for students who do not have adequate devices or internet connections in participating in online learning. Because not all students have adequate devices and internet connections, making the learning process during Covid-19 more likely to be in the form of assignments only by teachers and lack of interaction between students and teachers through digital platforms.

Online learning implemented by teachers during Covid-19 has not run optimally when compared to online learning according to experts. This is caused by several obstacles and obstacles that occur to students and teachers. According to (Zimmerman, 2012) said that in online learning, the interaction between teachers and students occurs online using technology used for synchronous interactions, such as video-conferencing and online chat, while for asynchronous interactions, such as e-mail, g-form, and so on. Learning carried out online or distance learning has had a negative impact on some students after the pandemic. The non-optimal nuance of learning as well as the sense of discomfort and confusion during online learning that lasts for a long time have an impact on the decrease in students' interest and motivation in learning.

The lack of motivation and interest of students after the pandemic can become a serious problem in the world of education. Online learning during

the pandemic has affected the level of student involvement in the learning process. Lack of student learning motivation can affect student learning outcomes. This is because students who lack motivation in learning will certainly lose enthusiasm in participating in learning and this will have an impact on their ability to understand the learning material. This sense of loss of enthusiasm can also affect student productivity in completing assignments and learning projects. So that this will have an impact on decreasing student learning outcomes, which can have a long-term impact on their educational development.

The low motivation of post-pandemic students is also in line with research carried out by Dewi (2023) which states that after the Covid-19 pandemic, students' motivation to learn has decreased. This is reflected in the various affectives of students in the learning process, including: loss of responsibility in the academic and non-academic process, lack of discipline, wanting everything instantly, and loss of competitive spirit in learning. This happens because during online learning, students do not get meaningful experiences, and there is a lack of interaction. So that online learning seems more boring.

The use of inappropriate and suboptimal learning models also contributes to student learning outcomes. Mismatch between the learning model and the characteristics of students can decrease their interest in learning. Therefore, it is necessary to adjust the learning model to better suit the needs and preferences of students. Every student has a different learning

style, and the use of learning models that do not pay attention to this diversity can make it difficult to understand the material. The absence of differentiation in learning approaches can make some students lose interest because they do not feel fulfilled in their learning style. It can also create a mismatch between students' individual needs and the learning strategies applied, potentially reducing their involvement in the learning process.

The low student learning outcomes due to the inaccurate use of the learning model are also in line with the research carried out by (Regita *et al.*, 2023) which states that the use of learning models that are not in accordance with student needs is one of the causes of a decline in student learning outcomes. Teachers who use lecture methods and use conventional learning models have an impact on the learning process. Students become less understanding of the learning material, and there are some students who have not completed it according to the Minimum Completeness Criteria (KKM) which is 75.

The use of learning media that is not interactive and has not fully integrated technology into the learning process can also be the cause of low student learning outcomes. This is because interesting and interactive learning media can be an attraction for students in the learning process. On the other hand, when learning media is less interesting or does not make good use of technology, students tend to lose interest, making it difficult for them to gain a deep understanding of the learning material. The use of non-optimal learning media can affect student engagement in the classroom and motivation to learn.



This condition shows how important the design and integration of effective learning media is in increasing student interest which has an impact on student learning outcomes.

The low student learning outcomes due to learning media that are not interactive or still conventional are also in line with the research carried out by (Maku *et al.*, 2021) which states that learning in Basic Programming subjects, especially in programming language introduction materials, has not run optimally because the use of learning media is still conventional so that students find it difficult to learn because the material is only sourced and centered from what the teacher conveys, so it is difficult for students to understand and makes some students feel bored and has an impact on low student learning outcomes.

Learning outcome problems have occurred in various places in Indonesia and a number of researchers have tried to conduct research to improve students' physics learning outcomes. One of them is by implementing an innovative and student-centered learning model. Such as the research carried out by (Suindhia, 2023) which states that the application of the inquiry learning model used in physics lessons can improve student learning outcomes. This is because in the learning process, students are more active in seeking information, analyzing a problem, and drawing their own conclusions. In conventional learning, more emphasis is placed on the dominance of teachers in the learning process. Students become passive and only rely on

teachers in learning so that students eventually reach a saturation point which has an impact on reduced motivation to learn.

The research was carried out by Suryani (2023) showed an increase in physics learning outcomes of class X students of MIPA 2 SMAN 3 Bengkalis after the implementation of the Jigsaw-type cooperative learning model. After the implementation of the Jigsaw-type cooperative learning model, it can be seen that students are serious in paying attention to the teacher's explanations and daring to ask questions and express opinions. In addition, students also become active in learning in the original group and expert group. And communication between students in the group went smoothly. In addition, there was also an increase in the percentage of completeness after the implementation of the jigsaw-type cooperative model. So it can be concluded that there is an increase in student physics learning outcomes along with the application of the jigsaw learning model.

According to research conducted by Hasanah et al (2020) showed that the application of the Teams games tournament (TGT) type cooperative learning model with Ludo games had an effect on student learning outcomes. Student learning outcomes have changed for the better because students are trained in doing problems because there is a Tournament that will train students to work on problems and there is also a game where in the game a ludo game is included which contains a question so that it can test students' understanding.

The research was carried out by (Rafiki *et al.*, 2023) shows that the application of the Number Head Together (NHT) type cooperative learning model has a strong influence in improving student learning outcomes at SMAN YRM Cihawar Rajadesa Ciamis. However, classes that use conventional learning methods can also improve student learning outcomes, but the influence is not too great. In the Number Head Together (NHT) type cooperative learning model, students play a more active role in learning, while in the conventional learning model, students play a passive role.

The improvement of student physics learning outcomes can also be improved by using learning media that are interesting to students so that using the help of learning media can optimize the application of learning models in schools. Based on research conducted by (Alamsah *et al.*, 2023) shows that the learning outcomes of classes that apply the TGT type cooperative model learning assisted by Wordwall in economics subjects, especially on the concept of international trade, are effective in improving student learning outcomes because the active involvement of students in the learning process with the Teams Games Tournament (TGT) type cooperative learning model affects in the process of developing their cognitive, namely being able to practice thinking skills and improve social activities well through assignments, games and tournaments so that by understanding the material taught can improve student learning outcomes.

Furthermore, the research carried out by (Akbar & Hadi, 2023) stated that the use of Wordwall learning media affects students' interests and learning

outcomes. This can be seen from the results of the research that the average indicators in the categories of happy feelings, student involvement, student attention and interest of students in the experimental class are higher than in the control class. The highest indicator category is the indicator of the student happiness category. Students in the learning process are focused when playing games and it can be seen that some students are encouraging their group friends while playing games. All students play an active role in the learning process. In addition, the learning outcomes of students in the experimental class were higher than the learning outcomes of students in the control class.

Based on the character of the global warming material which emphasizes more on understanding the material and based on the character of students who tend to be bored with the learning model that is less interactive and not in accordance with the student's learning style and sees various alternative solutions that have been presented, the cooperative learning model has the ability to improve learning outcomes that need to be tested. This is because the cooperative learning model can encourage students to collaborate with each other and work together in completing the assigned tasks (Aldistya, 2019). Through this process, each student in his group can share their information and cognitive with each other. This collaboration not only builds student engagement, but also improves their understanding of learning materials (Rukmini & Mafaza, 2022). Thus, through active interaction in collaboration, students can create an inclusive learning environment and motivate each other to achieve shared learning goals. So that the cooperative

learning model not only deepens students' understanding of the subject matter, but will also have an impact on improving student learning outcomes.

The cooperative learning model has several types, one of which is the Teams games tournament (TGT). The TGT learning model conditions students to think together in groups where each student is given the same opportunity to participate in game tournaments. Each group will be rewarded based on the score obtained. According to Susanna (2018) the TGT model has several advantages, namely increasing the dedication of time for assignments, prioritizing acceptance of individual differences, with a little time to master the material in depth, the teaching and learning process takes place with student activity, educating students to practice socializing with others, higher learning motivation, better learning outcomes, increasing kindness, sensitivity, and tolerance.

Another cooperative learning model is the NHT-type cooperative learning model. Number Head Together learning model (NHT) grouping students into several groups, then each group member is given a number and given the opportunity to answer the teacher's questions when there is a group that wants to answer. When there is a group that wants to answer a question, the teacher will randomly select one of the students from the group members by shaking the number that each group member has answered. The NHT model has several advantages such as providing opportunities for students to share ideas with each other and consider the most appropriate answers and can encourage students to increase their spirit of cooperation. In addition, this

learning model can also be applied in all subjects and for all age levels of students (Fathurrohman, 2016).

With the characteristics and advantages of the TGT and NHT types of cooperative learning models, these two cooperative learning models can be a potential solution to improve student learning outcomes on global warming materials. Both provide opportunities for each student to hone social skills, communication skills, and cooperation skills that are very important in understanding complex global warming materials. The TGT and NHT-type cooperative learning models encourage students to work together in groups to understand the subject matter. This can help students to understand the basic concepts of global warming more deeply and comprehensively. This student's activeness in the learning process plays a key role in forming a deeper understanding and integrating information from various perspectives. Through intensive cooperation and interaction in groups, students can form a more holistic and in-depth understanding of global warming issues.

In looking at the learning outcomes, the comparison between the TGT and NHT type cooperative models is an important consideration. Both have their own advantages and disadvantages, and determining which is better between the TGT and NHT-type cooperative models can provide insight into the effectiveness of looking at student learning outcomes. Based on research conducted by (Furoidah, 2023) stated that among the TGT and NHT type cooperative models, the TGT type cooperative model is more effective in improving student learning outcomes than the NHT type cooperative learning

model. In the application of the TGT type cooperative model, students become more tractionable and student interest increases. Students also enjoy and really enjoy the process of learning Arabic in the classroom. So that student learning outcomes also increase.

Apart from choosing the right learning model, the use of interactive learning media can also help improve student learning outcomes. Learning media is everything that concerns software and hardware that can be used to convey the content of teaching materials from learning resources to students (individuals or groups), which can stimulate students' thoughts, feelings, attention and interest in such a way that learning inside / outside the classroom becomes more effective (Jalinus & Ambiyar, 2016). There are many interactive learning media that can be used in the learning process, one of which is Wordwall.

Wordwall's media assistance in the implementation of the TGT and NHT learning models also helps improve student learning outcomes. This medium can be used to provide quizzes, games, and other interactive activities that can make learning more fun and engaging. This can increase students' motivation to learn and encourage them to be more active in the learning process. In addition, Wordwall media can also help students to test their understanding of the material that has been studied. Wordwall quizzes can be used to assess students' understanding of the basic concepts of global warming. Wordwall games can help students understand the cause-and-effect relationship between global warming and the various impacts it causes. By

utilizing the help of Wordwall media, it can make global warming learning more effective and efficient. Students can learn more fun and deeply, so that their learning outcomes can also improve.

Based on the background that has been described, the researcher is interested in conducting research with the title **“Comparison Of Physics Learning Outcomes Of Phase E Students Global Warming Material Between Groups Cooperative Model Type TGT With NHT Assisted By Wordwall”**. It is hoped that by applying the TGT and NHT type cooperative learning models assisted by Wordwall, a comparison of the learning outcomes of grade X students of SMAN 1 Tanjung Mutiara will be seen.

## **B. Problem Identification**

Based on the results of the initial study carried out, namely observations, interviews and document studies, the possible causes of low learning outcomes are caused by several things, including the following:

- 1) Online learning has not had a positive impact on the quality of learning implementation.
- 2) The low quality of online learning has an impact on low student learning motivation which ultimately has an impact on low student learning outcomes.
- 3) The use of learning models that are not appropriate and not optimal.
- 4) The use of learning media that is less interactive.



### **C. Problem Limitation**

In this study, it was carried out only to see the comparison of student Physics learning outcomes using the TGT and NHT type cooperative models assisted by Wordwall in grade X students of Phase E of SMAN 1 Tanjung Mutiara on global warming materials and learning outcomes were limited only to see student learning outcomes in the realm of cognitive and affectives.

### **D. Problem Formulation**

Based on the background and identification of the problems that have been stated above, the author formulates the problems, namely:

1. Is there a difference in the learning outcomes of physics students who are taught using the TGT and NHT learning models assisted by Wordwall?
2. Which of the TGT and NHT learning models is better used in teaching physics, especially on Global Warming?

### **E. Research Objectives**

The objectives of this study are as follows:

1. Determine the learning outcomes of students taught using the TGT and NHT learning models assisted by Wordwall.
2. Knowing which TGT or NHT learning model is better used in teaching physics, especially on global warming materials.

### **F. Research Benefits**

The results of the research that have been carried out are expected to provide benefits, including:

1. For teachers, it can be one of the alternatives that can motivate students to be more interested in physics lessons and improve student learning outcomes.
2. For students, to motivate them to be more proactive in learning and improve their learning outcomes.
3. For schools, providing input in making policies to improve the learning process so that the goals of education implementation can be achieved.
4. For other researchers, it can broaden their understanding and get additional inspiration when conducting research.
5. For researchers, as a provision of useful cognitive and experience and to complete the study program at the physics department of FMIPA UNP.