

## Improvement student learning achievement using the integration of the NHT model with Jigsaw on geometry topic

Khikmah Kurnia<sup>1\*</sup>, Supriyono<sup>2</sup>, Rintis Rizkia Pangestika<sup>3</sup>

<sup>1,2,3</sup>PGSD Department, Muhammadiyah University Purworejo, Indonesia

\*Email: [kurniakhikmah@gmail.com](mailto:kurniakhikmah@gmail.com)

### Abstract

This study aims to describe the increase in student learning achievement using the integration of the NHT model with the Jigsaw on geometry topic. The subjects were students of class V elementary school 2 Seren, Purworejo, Central Java. The research variables used were student achievement and the integration of the NHT model with the Jigsaw. Meanwhile, the research instrument used teacher observation sheets and evaluation of student achievement. The data analysis technique in this study used descriptive quantitative data analysis techniques. The results showed that in the first cycle there were 60% of students had finished learning. Meanwhile, as many as 40% of students have not finished learning. Therefore, it can be concluded that the average score of students in the first cycle was 64, 1. Then in the second cycle, 80% of the students who had to achieve the passing score were obtained. Meanwhile, as many as 20% of students have not finished studying. Therefore, it can be concluded that there has been an increase in student achievement, namely as much as 80% of students have achieved the success indicator, namely 75%. Therefore, it can be concluded that the integration of the NHT model with Jigsaw can improve student achievement in building material for semester 2 in class V elementary school 2 Seren Academic Year 2019/2020.

**Keywords:** NHT, Jigsaw, learning achievement

## INTRODUCTION

The 2013 curriculum is implemented to improve the quality of education to produce creative and competitive individuals to face life in the future. The 2013 curriculum underwent a fundamental change, namely learning from teacher-centered (teacher-centered) to being centered on students (student center). According to (Pane & Dasopang, 2017), the nature of learning is a process, namely the process of regulating, organizing the environment around students so that it can grow and encourage students to carry out the learning process. Students are required to be active in learning activities, and the teacher acts as a facilitator. The teacher only directs students if there are students who are not precise in understanding the subject matter. Therefore, teachers must provide exciting learning through the application of learning models. According to opinion (Suprijono, 2016) the learning model is a systematic procedure of learning how to interact in teaching and learning activities to achieve learning objectives. Then, (Trianto, 2012) suggests that the learning model is a plan or pattern that we can use to design face-to-face teaching patterns in class or arrange tutorials and determine learning materials/tools, including books. Films, types, computer media programs, and curricula (as courses for learning). By implementing the 2013 curriculum, learning models are cooperative learning, discovery learning, project-based learning, problem-based learning, and inquiry learning.

The cooperative learning model (cooperative learning) teaches students to collect and process information through group discussion activities. According to (Husen et al., 2018), cooperative learning contains

an understanding as a collective attitude or behavior in working or helping, among others, in an orderly collaboration in groups consisting of two or more people. Then, (Muna & Afriansyah, 2018) also believe that cooperative learning provides opportunities for students to exchange opinions, exchange ideas, help each other in completing tasks, and create an attitude of responsibility, cooperation, and positive dependence on each other. However, not all lessons can go as expected. Many problems still occur in learning activities, such as learning that still uses conventional learning, learning resources that are not yet available, material that is too broad, student difficulties in solving story problems, and student learning achievement is still low. According to (Pratiwi, 2019), (Sutipnyo & Mosik, 2018), and (Sholikhah & Hartono, 2015), the Numbered Head Together (NHT) type of cooperative learning model requires all group members to solve a problem. Furthermore, (Rahmawati et al., 2014) states that the NHT type of cooperative learning model is one of student-oriented learning, namely by doing group learning and student-centered.

Then, (Halimah & Sumardjono, 2017) argues that the steps of the NHT learning model are as follows:

- 1) Students are divided into groups. Each student in the group gets a number.
- 2) The teacher gives assignments, and each group does it.
- 3) The group discusses the correct answer and ensures that each group member can do it / know the answer well.
- 4) The teacher calls one of the student numbers, and the number called out of the group reports or explained the results of their collaboration.

- 5) Responses with other friends, then the teacher points to another group.
- 6) Conclusion

Meanwhile, (Shoimin, 2014) argues that Number Head Together is a group learning model in which each group member is responsible for the group assignment. There is no separation between one student and another student in one group to give and receive between one another. The steps for the NHT learning model are:

- 1) Students are divided into groups. Each student in the group gets a number.
- 2) The teacher gives assignments, and each group does it.
- 3) The group discusses the correct answer and ensures that each group member can work on it / know the answer well.
- 4) The teacher calls one of the student numbers, and the number called out of the group reports or explained the results of their collaboration.
- 5) Responses with other friends, then the teacher points to another number.
- 6) Conclusion.

The advantages and disadvantages of the NHT model, according to (Machfud, 2018) are as follows:

- 1) The advantages of the NHT model are:
  - a) Motivate
  - b) Increase self-confidence
  - c) Students become more active
- 2) The disadvantages of the NHT model are:
  - a) It takes a long time

- b) Make students panic or nervous
- c) Requires concentration in managing the class

Furthermore, (Rofiqoh et al., 2015) conveys the advantages and disadvantages of the NHT model. The NHT model has the advantage that each student conducts discussions seriously. Students become ready because the teacher will point to one number, and most students can express opinions. Intelligent students can teach less intelligent students. The disadvantage of the NHT model is that the teacher will repeat the number that has been called, and the teacher calls not all group members.

The following cooperative learning model that is an alternative for teachers in teaching is Jigsaw. According to (Kristiana & Gregorius, 2014), the jigsaw learning model is cooperative in small groups consisting of 4-6 students. According to (Rusman, 2018), the type of jigsaw cooperative learning model is a cooperative learning model that focuses on student group work in the form of small groups. The steps for the jigsaw model are as follows:

- 1) Students are grouped with members of 4 people.
- 2) Each person in the team is given different materials and assignments.
- 3) Members of different teams with the same assignment form a new group (expert group).
- 4) After the expert group has discussed, each member returns to the original group and explains to the group members about the subchapters they mastered.
- 5) Each expert team presented the results of the discussion.
- 6) Discussion.

7) Closing.

Isjoni in (Rosyidah, 2016) suggests the advantages and disadvantages of the jigsaw cooperative learning model, namely:

- 1) Students can interact with peers and teachers as guides.
- 2) Peer motivation can be used effectively to improve both student cognitive learning and effective student growth.
- 3) Improve student responsibility.
- 4) Encourage active students and help each other in mastering the subject matter.
- 5) To optimize the benefits of group learning.

Then, (Abdullah, 2012) and (Maharani, 2017) suggest that the Jigsaw cooperative learning model has advantages. It can foster a spirit of cooperation and enthusiasm in learning for students, increase motivation to respect fellow students, and provide opportunities to express ideas openly of a large number of students. Limited students in each group and train students to be able to communicate effectively. The disadvantage of the jigsaw type of cooperative learning model is that the main principle of this learning model is learning by friends alone so that it will be an obstacle because of differences in perception in understanding a concept that will be discussed together with other students, it is difficult to convince students to be able to discuss conveying material to friends if students do not have self-confidence, the initial use of the jigsaw learning model is difficult to control because it requires sufficient time and thorough preparation before learning takes place, and its application to large classes (more than 40 students) is challenging. The NHT and jigsaw models have

coherence, making students more active and increasing cooperation in group discussions. Then, (Fiyany et al., 2018) suggest that the jigsaw learning model is a cooperative learning model consisting of four students. Therefore, researchers integrated the NHT and jigsaw models in learning activities. According to (Pangestika et al., 2018), integration between the NHT and jigsaw learning models, namely in the jigsaw type, there is an origin group and an expert group, whereas long as they are still in the original group (for example, 1 group of 4 members) each member of the homegroup uses a number different placed on the head. The use of this number is included in the NHT learning model. The different effects of NHT and jigsaw models on the student's interpersonal intelligence have been investigated by Kurniawati et al. Students with high, medium, and low interpersonal intelligence, and the Jigsaw provides better mathematics learning achievement than the NHT type cooperative learning model and direct learning model (Kurniawati et al., 2017).

The research about the Jigsaw and NHT model has been done by Sugetiningsih et al. The Jigsaw cooperative learning model is more effective in increasing student cooperation and responsibility in Social studies (Sugestiningsih & Sudrajat, 2018). The same result that Jigsaw is better than NHT on student learning outcomes is also obtained in other studies (Nizar et al., 2016) and (Komariah et al., 2016). This research was carried out to describe the improvement of student learning achievement using the integration of the NHT model with the jigsaw material of building space in class V semester 2 of Public Elementary School 2 Seren in the 2019/2020 school year.

## METHODS

The type of research the writer will use is Classroom Action Research. Classroom Action Research (PTK), according to (Arikunto, 2006) can be shortened to the term Action Research (PT) because the term "class" only shows several subjects that are targeted for improvement. The name PTK was used to become popular, starting from the education sector. Therefore, we know it as PTK. This research was conducted at Seren 2 Public Elementary School, Gebang District, Purworejo Regency, Central Java Province. The time for conducting the research is from February to July 2020 in the second semester of the 2019/2020 school year. The research subjects were 10-grade students consisting of 8 female students and two male students—data collection in conducting research using three methods, namely unstructured interviews, structured observation, and tests. According to (Sugiyono, 2012), an unstructured interview is an independent interview in which the researcher does not use interview guidelines arranged systematically and thoroughly for data collection. Then, Structured observations, according to (Sugiyono, 2012) are observations that have been systematically designed about what will be observed, when, and where it is.

Furthermore, according to (Widoyoko, 2012), the test is a tool to take measurements, namely a tool to collect information on the characteristics of an object. The skills, knowledge, talents, and interest talents possessed by an individual or group are examples of object characteristics in data collection using tests. Therefore, student learning



achievement can be said to be successful if there are as many as 75% of students who have reached the KKM score of 66.

## DISCUSSION

The Covid-19 pandemic has affected various sectors, including education. The effects of the Covid-19 pandemic on education have led students to be encouraged to study at home, as described in Figure 1. Students feel bored with the application of learning at home. Therefore, according to the problems that occur, the implementation of this research is carried out at home while still implementing health protocols such as wearing masks. The research subjects who participated in the study were only ten students, so there were not too many students. This was carried out so that there were no crowds of students considering the Covid-19 pandemic still happening. Health protocols must be implemented in the conduct of research.



Figure 1. The learning process during the Covid-19 pandemic

The research process was conducted within two cycles, where each cycle has twice of meeting. The time for each cycle is 4x35 minutes. Both cycle I

and cycle II consist of four stages. They are planning, acting, observing, and reflecting. The description of each stage is in the following paragraph.

### Cycle I

#### a. Teacher Observation Data

Observations are made when the teacher carries out the learning using the observation sheet. Observations are carried out in every meeting. So, in cycle I, the observer observed two observations in learning activities (attachment to teacher observations). The results of teacher observations in the first cycle obtained 77,12% in the good category. This observation is carried out to determine the suitability of the implementation of learning with the learning model applied in learning activities. The result of the observation can be seen in Table 1.

Table 1. Recapitulation of Teacher's Observation Cycle I

No	Meeting to-	Total score
A.	Meeting 1 Cycle I	37
B.	Meeting 2 Cycle I	39
<b>Total score</b>		<b>76</b>

#### b. Observation data on student achievement

The student achievement is shown in Table 2.

Table 2. Recapitulation of Student Achievement in Cycle I

No.	Name	The score of cycle 1	Mastery learning	
			Yes	No
1.	Adestiyana Restu Sagita	66	√	
2.	Azizah Aulia Farida	39		√
3.	Damabiyu Neira D. F.	72	√	
4.	Frida Zubaeda	75	√	
5.	Jendi Aldha Riski	88	√	
6.	Lisa Jasa Harani	53		√
7.	Rika Rahmadani	47		√
8.	Virna Dewantari	77	√	

No.	Name	The score of cycle 1	Mastery learning	
			Yes	No
9.	Nuris Sakinah	53		√
10.	Sifa Herbiramadani	81	√	
<b>Total Value</b>		641		
<b>Average</b>		64,1		

Based on Table 2, it can be concluded that the completeness of learning in the first cycle obtained a percentage of 60% with a total of 6 students and students who have not reached completeness learning in cycle I as much as 40% with a total of 4 students. Identification of problems in cycle I:

- 1) Students make noise in the classroom.
- 2) Students still need to be regulated in carrying out core activities in the learning process using the integration of the NHT model with Jigsaw.
- 3) Students still have difficulty presenting the results of the discussion in front of the class.

## Cycle II

### a. Teacher Observation Data

Observations are made when the teacher carries out the learning using the observation sheet that has been made. Observations are carried out in every meeting. So, in cycle II, the observer observed two observations in learning activities. The results of teacher observations in the first cycle obtained 86,46% in the very good category. This observation is carried out to determine the suitability of the implementation of learning with

the learning model applied in learning activities. The results of teacher observations in cycle II can be seen in Table 3.

Table 3. Recapitulation of Teacher's Observation Cycle II

No	Meeting to-	Total score
A.	Meeting 1 Cycle II	42
B.	Meeting 2 Cycle II	41
<b>Total score</b>		<b>83</b>

b. Observation data on student achievement

Based on the calculations made, it is known that the total values are in Table 4.

Table 4. Recapitulation of Student Achievement in Cycle II

No.	Name	Cycle II	Completeness	
			Yes	No
1.	Adestiyana Restu Sagita	88	√	
2.	Azizah Aulia Farida	58		√
3.	Damabiyu Neira D. F.	58		√
4.	Frida Zubaeda	86	√	
5.	Jendi Aldha Riski	96	√	
6.	Lisa Jasa Harani	79	√	
7.	Rika Rahmadani	72	√	
8.	Virna Dewantari	93	√	
9.	Nuris Sakinah	84	√	
10.	Sifa Herbiramadani	98	√	
<b>Total Value</b>		<b>812</b>		
<b>Average</b>		<b>81,2</b>		

Based on Table 4, it can be concluded that the completeness of learning in the second cycle obtained a percentage of 80% with a total of 8 students and 20% of students who had not reached completeness learning in cycle I, with a total of 2 students. From cycle II, the following problems can be identified:

- 1) Students are orderly and calm in participating in learning activities.

- 2) Students do not need teacher guidance in carrying out core activities in the learning process using the integration of the NHT model with Jigsaw.
- 3) Students dare to come forward to present the results of their discussion in front of the class.
- 4) Student learning achievement in cycle II obtained classical learning completeness achieved was 80% with an average class score of 81.2.

Based on the research result, the NHT model integration and Jigsaw in SDN Seren 2 can improve students' scores, activity, and motivation. The students are invited to discuss in a small group to work together and understand the material being explained by the teacher. The discussion process makes every student be active and have a sense of responsibility for the group assignment. It is aligned with the opinion of Sugestinarsih and Sudrajat. They state that the NHT model and Jigsaw influence the students' collaboration and responsibility (Sugestinarsih & Sudrajat, 2018). The integration of the NHT model and Jigsaw can give the chance to train the ability with the initial group, the expert group, and more focus on the teacher's assignment. Every member of the group communicates with each other and doesn't work individually, as stated by Rosyidah and Maharani (Rosyidah, 2016) (Maharani, 2017). The students are also learning to express their opinion about the material given by the teacher. Therefore, it can improve the confidence of the students.

The novelty of this research is the integration of two learning models, NHT and Jigsaw. Unfortunately, there hasn't been found yet the

research that makes the integration between these two models. Most research in the past made the comparison of these two models. However, they didn't integrate both of these, as the research done by (Komariah et al., 2016), (Nizar et al., 2016), dan (Sugestiningih & Sudrajat, 2018).

## CONCLUSION

Based on the results of the research and discussion described in the previous chapter, it can be concluded that the mathematics learning achievement of the fifth-grade student room building material at SD Negeri 2 Seren uses the integration of the NHT model with the Jigsaw in cycle I as follows: Learning achievement in the first cycle resulted in 6 students have achieved complete learning. However, four students have not achieved complete learning with an average grade of 64,1. Thus, completeness of classical learning in cycle I obtained a percentage of 60% so that it has not reached the expected success indicators. Then, in the second cycle, the results showed that as many as eight students had completed the learning, and two students had not yet achieved complete learning with an average grade of 81.2. Therefore, this research can be said to be successful so that researchers do not need to continue to the next cycle.

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