The Effect of Cooperative Learning Model Type Think Pairhare (TPS) on the Students' Cognitive at Class X SMAN 1 Suliki

Asti Febrina[✉]

Departement of Agribusiness, Politeknik Negeri Sambas, Sambas, Indonesia
astifebrina02@gmail.com

Abstract. This type of research is quasi-experimental. The design that will be used in this study is the randomized posttest only control group. The experimental group was subjected to treatment. The sample in this study used two sample groups, namely experimental class students and control class students who were observed from members of the population taken by purposive sampling technique, namely the sampling technique was carried out by considering the needs of the number of students. The same and the average value of students is almost the same. The instruments used were objective tests for cognitive competence, and observation sheets for affective and psychomotor competence. The variable that was measured in this study was the use of the Think Pare Share learning model on students' cognition. The results showed that the average value of the cognitive domain of the experimental class students was 74.93 while the average value of the control class students was 65.40. The value of tcount is 2.45 and ttable is 2.00. This shows t count > t table so that the hypothesis is accepted, namely there is an influence on the cognitive competence of students who follow the cooperative learning model. It is known that the learning competence in the cognitive domain of students who follow the TPS type cooperative learning model is better than the cognitive learning competence of students who take part in conventional learning.

Keywords: Think Pair Share · Cooperative Learning · Cognitive

1 Introduction

Education which can be described as a process of knowledge transfer, value transformation, and personality formation with all its components, is more than just teaching. Therefore, the focus and interests are more technical in nature because the training is more focused on the development of specific specialists or disciplines. To achieve balance and excellence in human and societal growth, education is a necessary process. Compared to teaching, education places more emphasis on developing one's consciousness and personality and spreading knowledge and skills. A country or state can pass on religious beliefs, culture, ideas, and knowledge to the next generation through this kind of approach so that they are fully prepared to deal with it (Nurkholis, 2013). The quality of education is a major problem that is always in the spotlight in the world of

education. Education is a process of forming quality human resources, namely having knowledge, having skills and a positive attitude. Improving the quality of education can be achieved through improving the quality of the learning process which leads to the quality of educational outcomes.

In essence, learning is a process that involves structuring and managing the environment around pupils so that it can develop and motivate students to engage in the learning process. Another definition of learning is the process of assisting or guiding students as they learn. The amount of kids that have challenges is where the teacher's mentorship responsibility begins. There are, of course, numerous variances in learning, such as the fact that some students can easily digest the material while others take longer to do so. These two variations enable teachers to plan learning tactics that are appropriate for each student's situation. As a result, "regulation" is the fundamental component of learning if "changing" is the nature of learning (Djamarah, B, *et al*. 2006).

The implementation of the learning process in the classroom includes preliminary, core, and closing activities. According to the standard process of Permendiknas 41 of 2007, the implementation of core activities is a learning process to achieve Basic Competence (BC) which is carried out interactively, inspiring, fun, challenging, motivating students to participate actively, and providing sufficient space for initiative, creativity, and independence in accordance with the talents, interests and physical and psychological development of students. Article 25 (4) Permendiknas Number 19 of 2005 concerning National Education Standards has also explained that graduate competencies include attitudes, knowledge, and skills. This means that learning and assessment must develop student competencies related to the affective (attitude), cognitive (knowledge), and psychomotor (skills) domains.

Learning outcomes are things that are achieved or obtained by students as a result of their efforts or thoughts. These things are expressed in the form of mastery, knowledge, and basic life skills and are determined by an evaluation of the attitudes, knowledge, and basic life skills involved in the learning process. Various aspects of life so that individual behavior changes statistically (Setiawan Hendri, 2014). Agree with Sustrisno (2016), states that learning outcomes are an evaluation treatment that can reveal aspects of the thinking process (cognitive domain). Winarno also stated that most people interpret student learning outcomes as tests, exams, or tests. The purpose of the test is to produce an index that can be used to measure student achievement. The following are key measures of student learning outcomes: (a) Successfully achieving the absorption of individual and group learning materials. Minimum Learning Completeness Criteria (KKM) are usually used to measure this absorption; (b) Students have demonstrated the behavior described in the learning objectives, both individually and in groups. Syaiful Bahri Djamarah and Aswan Zain, emphasized that the indicator of achievement of learning outcomes is the absorption of students. The learning process requires the right learning model in order to improve the cognitive abilities of students. A learning model that can make students think critically, innovatively and scientifically. Based on the results of observations at SMAN 1 Suliki on August 23 and 24, 2021, it was found that biology learning had not gone as expected. Students are less motivated in participating in learning, are confident, have a sense of responsibility towards the group, and are not active. This can be seen at the time of the discussion and when the teacher asks a question that answers only one or

two students, the rest prefer to be silent. The significance of each student's contribution to the group's success in meeting the learning objectives is not emphasized by the teacher. High-ability students often seem to dominate class, which promotes learning. Students who are eager to advance are exactly that. As a result, students become more passive and reliant on peers who are regarded capable. Conversely, students with low or passive talents do not take advantage of opportunities to enhance their potential.

Based on the documentation study of SMAN 1 Suliki, the researchers found the fact that the average midterm exam1 score in biology subjects showed that there were still many students who were below the school's Minimum Completeness Criteria (MCC), which was 70. Based on interviews with teachers and biology students, information was obtained that teachers still emphasize assessment on the cognitive domain only. Generally, students have difficulty in understanding biology material, especially blood circulation material, which is too much and students are less able to understand the relationships between concepts well, so that it has an impact on students' low grades.

All the problems as stated above have an impact on the low learning competence of students, cognitively student learning outcomes are still below the expected average value. If this is allowed to continue, it is feared that student learning outcomes will be lower. To overcome some of these problems, teachers are expected to create a learning atmosphere that allows students to be actively involved in the learning process. According to Sardirman (2006) there is no learning if there is no activity. So active student involvement in learning will be more meaningful for students. Based on the explanation of the problems above, one of the efforts that teachers must make to help students become active and better understand the subject matter is to use a cooperative model. Cooperative learning has several types with different steps, one of which is Think Pair Share type cooperative learning, hereinafter abbreviated as TPS.

Think Pair Share (TPS) cooperative learning model is a type of cooperative learning designed to influence student interaction patterns. Assuming that all recitations or discussions require arrangements to control the class as a whole, and the procedures used in TPS can give students more time to think, to respond and to help each other. As revealed by Lie (2008) that TPS cooperative learning can provide opportunities for students to work alone and cooperate with others, as well as optimizing student participation. A straightforward cooperative learning model is the Think Pair Share model. Students are given the opportunity to work both independently and collaboratively using this method. The benefit of this method is to maximize student participation (Lie, 2004).

With the application of TPS cooperative learning in the learning process, it can enable students to gain learning experiences that can stimulate students to think and communicate. TPS cooperative learning can also create good interactions in the biology learning process, both between students and teachers, as well as students and students. Students will be more responsible for the tasks given by the teacher in pairs, so that they can foster an attitude of solidarity among fellow students, regardless of their social life background and cognitive abilities, so that it will have a good influence on increasing student learning competencies. This has been proven by Pratiwi (2011), the results of his research show that the application of the Think Pair Share (TPS) cooperative learning model can increase student learning activities and competencies. Seen during the implementation of discussion activities, when students ask questions, and answer

questions during the learning process. Based on the condition and character of the tenth grade students of SMAN 1 Suliki which the writer has previously stated, the writer will apply the TPS type of cooperative learning model. The use of this model is expected to assist students in communicating to convey information, such as expressing ideas, asking questions, responding to questions, and improving student learning competencies.

2 Methods

This type of research is a quasi-experimental. This type of research was chosen because it does not allow it to fully manipulate or control experimental variables and conditions as pure experimentation. This study used two classes, namely the experimental class and the control class. In the experimental class, students are taught using the TPS type cooperative learning model, while in the control class students are taught using lecture method. The design that will be used in this study is The randomized posttest only control group. The experimental group was subjected to treatment. In the final activity, after the treatment was completed, the experimental group was given a posttest to both groups. The research population was all students of class X SMAN 1 Suliki semester 2 totaling 214 people, grouped into 7 classes.

The sample in this study used two sample groups, namely experimental class students and control class students who were observed from members of the population who were taken by purposive sampling technique, namely the sampling technique was carried out by considering the need that the number of students was the same and the average value of students was almost the same. To take the experimental class and control class is done by lottery. The sampling steps are as follows.

a. Request and calculate the value of the Mid semester I Biology subject for SMAN 1 Suliki class students for the 2020/2021 school year which consists of 7 classes.
b. Determine the experimental class and control class by lot, by taking a roll of paper with the class name written on it as a sample group. The name of the class that is taken is designated as the experimental class, namely Class X.5 and the name of the class that is not taken is designated as the control class, namely Class X.6.

The independent variable in the study is the treatment given to students. The treatment given is the use of the TPS type cooperative learning model. The dependent variable is the variable that is influenced by the independent variable. In this study, the dependent variable is the students' cognitive competence in learning biology after the treatment is given. Cognitive competence in the form of student abilities that can be seen from the test. The instrument used in collecting data in this study was in the form of a test carried out at the end of the study given to the sample class. Before the instrument is used by the class on the sample, the instrument is first tested on students who are not in the sample class in order to get good questions. Test trials were conducted to determine the validity of the test items, the level of difficulty of the questions, the discriminatory power and reliability of the test.

Table 1. Average value, maximum value, minimum value and standard deviation of the two sample classes in the cognitive domain

Class	N	$\bar{X}$	X_{max}	X_{min}	S
Experiment	30	74,93	94 48	48	15,04
Control	30	65,40	90 36	36	16,22

Table 2. Hypothesis Testing for Cognitive Domain Competence.

Class	$\bar{X}$	T_{count}	ttable	conclusion
Experiment	74,93	2,45	2,00	$T_{count} > t_{table}$, then the hypothesis is accepted
Control	65,40			

3   Result and Discussion

Based on the research that has been done in the two sample classes, data obtained in the form of cognitive competence in learning biology of students. Data on the cognitive domain was obtained after completing the learning process for the two basic competencies. The data on the biology learning competency test in the cognitive domain was obtained through a final test using a written test technique in the form of multiple choice questions. This final test was carried out at the end of the meeting given to experimental class students and control class students. Research data on students' cognitive learning competence can be seen in Table 1.

Information:

N = Number of Sample Members
$\bar{X}$ = Average Score
S = Standard Deviation

Based on Table 1, it can be seen that the average value of the cognitive domain competence of the experimental class students is 74.93 while the average value of the control class students is 65.40. It can be defined that the average score of students who follow the TPS type of cooperative learning model is better than students who take conventional learning. This means that the TPS cooperative learning model has an effect on students' biology learning competence in the cognitive domain. Based on the normality test and the final test homogeneity test, it is known that the two sample classes are normally distributed and have homogeneous variance. Therefore, the t test is used to test the knowledge domain hypothesis.

The t-test aims to determine the differences in students' cognitive learning competencies using the TPS cooperative learning model and using conventional learning. As according to Sugiyono (2011), hypothesis testing using t-test aims to determine the relationship between independent variables on the dependent variable under study, the

hypothesis is accepted or rejected. The cognitive domain competency hypothesis test can be seen in Table 2.

Based on Table 2, it can be seen that the value of tcount is 2.45 and ttable is 2.00. This shows that tcount > t table so that the hypothesis is accepted, that is, there is an influence of cognitive competence of students who follow the TPS type of cooperative learning model. Thus, there are differences in the competence of the cognitive domain between the experimental and control classes. It can be seen that the cognitive domain learning competence of students who follow the TPS type cooperative learning model is better than the cognitive domain of students who follow conventional learning. The learning process is a process of developing an overall personality attitude through various interactions and learning experiences. Realizing the importance of involving students in the learning process, in class X biology learning at SMAN 1 Suliki, research has been carried out using a learning model that can stimulate student activity, namely the application of the TPS type cooperative learning model.

In the implementation of this research, the thing that underlies the difference between the experimental class and the control class is the use of the TPS type cooperative learning model and the conventional learning model. From the results of data analysis, it is known that the competence of the cognitive domain that uses the TPS type of cooperative learning model is higher than the competence of the cognitive domain that uses conventional learning. TPS type cooperative learning model is very effective to improve student achievement because students are more active in learning, both individually and in groups. Studying in groups will increase students' understanding to remember and understand the subject matter longer. In contrast to conventional learning, teachers tend to be more active so that students are less enthusiastic and sometimes sleepy during learning. TPS type cooperative learning model students understand the subject matter faster because they tend to be more active in finding answers to the problems given by the teacher. This self-search process will accelerate and strengthen the level of student understanding so that student achievement can be increased easily.

The application of the TPS type cooperative learning model has a positive impact on students' cognitive competence. This is because the TPS type of cooperative learning model is a learning model that provides opportunities for students to work alone and work with others. This learning model makes students think on an ongoing basis, with this thinking students will more easily understand and remember the material. According to Huda (2011) the TPS type cooperative learning model allows students to work alone and cooperate with others, optimizing student participation in the learning process. The process of learning activities with the TPS type learning model has an influence on the competence of the cognitive domain of students, this can be seen from the acquisition of the average value of the experimental class learning outcomes which are higher than students in the control class who are given conventional learning.

The difference in learning outcomes between the experimental class and the control class is because the experimental class students are supported by the use of the TPS type of cooperative learning model. Trianto (2011) states that the TPS learning model can give students more time to think, to respond and to help each other in learning so as to improve student learning outcomes. The TPS type cooperative learning model can encourage students to think independently, and can foster active activities and require

all students to participate in discussions with their partners. According to Trianto (2011) this type of TPS cooperative learning model is a learning model consisting of 3 stages, namely thinking (thinking), pairing (pairing), and sharing (sharing) which are used to influence student interaction patterns.

Biology learning with TPS type cooperative learning model in the experimental class begins with the teacher dividing the students into several groups, each group consisting of 2 people. Grouping of pairs is done heterogeneously based on academic ability. As stated by Lie (2008) heterogeneous groups are very effective because: 1) it provides opportunities for students to teach and support each other, 2) improve relationships and interactions between students, 3) can facilitate teachers in managing the class. In the early stages the teacher explains the subject matter that is useful as initial knowledge for students.

Next, students are asked to think about the question or issue independently for a few moments. This stage is called thinking, at this stage students are required to be able to develop cognitive aspects, namely by remembering and understanding the material that has been delivered. Thinking independently is one of the efforts to give responsibility to each student individually. The existence of thinking activities in the TPS type cooperative learning model provides many advantages. Individuals can develop their own thinking because of the time to think (think time) so that the quality of students' answers can also be remembered. According to Nurhadi (2004), accountability is because each student must report the results of their respective thoughts and share them with the whole class.

In the Pairing Stage, the teacher asks students to pair up with other students to discuss what they have been thinking at the Thinking stage. At this stage, each student presents his or her ideas, gives each other input and feedback, and at the end of the discussion, it is hoped that they have been able to formulate a conclusion that belongs together to be conveyed at the next stage. This can be seen in the experimental class with the willingness of students to join their partners. Completing the tasks contained in the worksheets are in the form of mind maps and description questions given by the teacher and actively participate in discussions with their partners, so that the knowledge gained by students does not come from the teacher alone but with pairs, knowledge is also obtained by students from their friends. According to Johnson (1984) the discussion process that occurs increases the ability to find and develop higher cognitive strategies than individual learning. The main thing that is expected to be achieved in this stage is the unification of values, concepts and ideas.

Then at the Sharing stage, the teacher asks each pair to share with the whole class what they have produced in the pairing stage. This step is carried out by the teacher going around the class from one pair to another, so that a quarter or half of the pairs get the opportunity to present the results of their discussion in front of the class. All group members seem to be trying to master the subject matter, because every student has the same opportunity to be called by the teacher to present to the front of the class. Even students who are shy and have less ability try hard so that it is clear that there is no term "hitting the name" in the group. TPS type cooperative learning model is very effective to improve student achievement because students are more active in learning, both individually and in groups. According to Nurhadi (2004) TPS type cooperative learning has several advantages including in the context of developing students' potential

in social integration, motivating each other, and sharing because learning from peers will have a positive effect on success in learning.

At the sharing stage, more emphasis is placed on the ability of students' appearance or performance in presenting the results of their group discussions in front of the class. By expressing ideas, listening to the opinions of friends, and together building understanding or concepts, it is very important in learning because this can foster student learning motivation. Previously, students were lazy to ask questions and were not willing to explain the subject matter in front of the class, by sharing students were accustomed to being active. Students can ask the part that is not understood, correct the part that is wrong, and express their opinion on the answer of the pair who presented in front of the class. The percentage partner can also defend his answer or accept criticism and suggestions from other partners. According to Slavin (2009) that during the learning process if the learning process is well organized, students in cooperative groups will learn from each other to ensure that each student in the group has mastered the concepts that have been thought of.

At the end of the lesson in the experimental class, the teacher gives an award to the group of pairs of students who are the most active and who answer correctly will receive an award. Students whose group received an award cheered happily because their group scored the best. The award given will be a driver of student motivation in learning. The award that will be given by the teacher at the end of the lesson increases students' motivation to learn better. Giving awards to this group is in accordance with the opinion of Slavin (2009) which says that "group rewards based on group performance create an interpersonal reward structure, where group members act as providers of social reinforcement in supporting group efforts related to group tasks". The next meeting, it was seen that the students were trying to make their group the ones who would get the award, it was seen that the students were motivated and enthusiastic to learn. This is in accordance with the opinion of Slavin (2009) if the teacher does not care about the teams that are not doing the task and gives awards to the students who do the work well, then the other team will immediately do the task.

While in the control class, researchers used conventional learning. Conventional learning in the control class begins with the teacher dividing the students into several groups, each group consisting of 4-5 people to carry out discussions. The division of these groups is based on the order of seating. Next, the teacher explains the material and provides opportunities to ask questions that have not been understood from the material being taught. During the learning process in the control class, students were less enthusiastic in learning. Many students did not participate in group discussions, only a few students who wanted to discuss. Other students mostly do the exercises alone, chatting with adjacent groups. The teacher was seen several times reprimanding students chatting, there would be no effort to encourage students to want to participate in groups. In the learning process students' critical thinking skills are not achieved because students are not actively involved in completing discussions. This causes some students who are less serious in carrying out discussions so that discussions take a long time.

During the presentation in front of the class, only a few students were enthusiastic about participating in the class discussion, only a few students gave responses and questions during the presentation in front of the class. In the learning process the teacher

should provide more material direction to students. So that active students are students who are used to asking questions, still tend to be passive students in discussing. Conventional learning is characterized by teacher-centered learning. Conventional learning is a term in learning that is commonly applied in everyday learning. Learning design is linear and is designed from separate sub-concepts to more complex concepts (Sofa, 2008). Linear learning means that one step follows another, where the second step cannot be done until the first step is done.

The difference in the learning process in this case is clearly the difference in the learning process in the experimental class and the control class, so that this difference can also be seen in the learning outcomes of students' cognitive domains. The experimental class of students who follow the TPS type of cooperative learning model has an average value of cognitive competence that is better than the average value of cognitive competence in the control class of students who take conventional learning. This is in accordance with the opinion of Isjoni, (2009) students who learn to use the cooperative learning model will have high motivation because they are encouraged and supported by peers. Rusmaryanti's research (2013) concluded that student achievement with the Think Pair Share cooperative learning model is better than student achievement using conventional learning models.

4   Conclusion

Based on the formulation of the problem, submission of hypotheses, analysis of research data and discussion, it can be concluded that the cognitive competence of students who follow the TPS type of cooperative learning model is better than students who follow conventional learning. This is evidenced by the average value of the cognitive domain competence of the experimental class students of 74.93 while the average value of the control class students is 65.40. Can be seen from the value of tcount is 2.45 and ttable is 2.00. This shows that tcount > t table so that the hypothesis is accepted, that is, there is an influence of cognitive competence of students who follow the TPS type of cooperative learning model. From the results of this study, it can be concluded that by using the TPS learning model, it can significantly improve the cognitive domain of biology subjects, so that it can be used as an alternative for teachers in choosing learning models.

References

Djamarah,B.S, Zain, A. Strategi belajar mengajar. Jakarta : Rineka Cipta. P 106. 2006.

Huda, M. Cooperative Learning: Metode Teknik, Struktur dan Model Penerapan. Yokyakarta: Pustaka Belajar. 2011

Isjoni. Pembelajaran Kooperatif Meningkatkan Kecerdasan Komunikasi Antar Peserta Didik. Yogyakarta: Pustaka Belajar. 2009

Johnson. Learning Together and Alone: Cooperation, Competition, and Individualization. New jersey: Prentice-Hall, Inc. 1984

Rusmayanti, R. Penggunaan Metode Pembiasaan Dalam Meningkatkan Perilaku Moral Anak Kelompok B Di Tk Bina Anak Sholeh Tuban. Jurnal BK UNESA. Volume 04 Nomor 01 Tahun 2013, p 329 – 337. 2013

Lie, A. Cooperative Learning: Mempraktekkan Cooperative Learning di Ruang-Ruang Kelas. Jakarta : PT. Grasindo. 2004

Cooperative Learning: Mempraktikan Cooperative learning di Ruang-Ruang Kelas. Jakarta : PT. Gramedia Widiasarana Indonesia. 2008

Nurhadi. Kurikulum 2004 Pertanyaan dan Jawaban. Jakarta: Grasindo. 2004

Nurkholis. Pendidikan Dalam Upaya Memajukan Teknologi. Jurnal Kependidikan, Vol. 1 No. 1. 2013

Pratiwi, R.W. "Pengaruh Penerapan Pembelajaran Kooperatif tipe Think Pair Share Terhadap kemampuan matematika siswa kelas VII SMPN 1 Kecamatan Situjuh Limo Nagari". Tesis tidak diterbitkan. Padang: Universitas Negeri Padang. 2011

Sofa. Perbedaan pembelajaran kooperatif dan pembelajaran konvensional. Artikel. Tedapat dalam http://massofa.wordpress.com/2008/09/12/perbedaan-pembelajaran-kooperatif-dan-pembelajaran-konvensional/. diakses 17 Juni 2022

Slavin, R.E. Cooperative Learning Teori Riset dan Praktik. Terjemahan. Lita. Bandung: Nusa Media. 2009

Sugiyono, .Metode Penelitian Kuntitatif Kualitatif dan R & B, Bandung: Alfabeta. 2011

Setiawan, Hendri. Penerapan Model Pembelajaran Kooperatif tipe NHT(Numbered Head Together) untuk meningkatkan Aktifitas dan Hasil Belajar teknik dasar passing bola basket pada siswa kelas VII SMPN 1 Sukasada. Jurnal PJOK Undiksha. Vol 2, No 1. 2014

Sutrisno Perdana. Faktor-Faktor Yang Mempengaruhi Hasil Belajar Siswa Pada Pembelajaran Praktik Kelistrikan Otomotif SMK Di Kota Yogyakarta. Jurnal Pendidikan Vokasi UNY. Volume 6, No 1,P 111-120. 2016.

Trianto. Mendesain Model Pembelajaran Inovatif Progresif. Jakarta: Kencana Prenada Media Grup. 2011