

Application of Cooperative Learning Models Think Pair Share Type Used By Index Card Match to Improve Understanding Concept of Class X Students of SMAN 2 Singingi

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ABSTRACT

The implementation of good and challenging learning in learning does not only form learning that is centered on the teacher or only on the students, but must contribute to each other so that educational goals can be realized. The aim of this research is to determine the differences in conceptual understanding of students who apply the TPS cooperative learning model using the ICM method and those who use conventional learning. This type of research is a Quasi Experiment using a Posttest Only Design, namely using one experimental class and one control class. The sampling technique is random sampling. The sample in this study was students from SMAN 2 Singingi using class X6 as the experimental class and class X5 as the control class. Research data was collected using a test in the form of a posttest totaling 20 questions which were analyzed descriptively to see the increase in students' understanding of concepts, using SPSS 29 for inferential analysis. The results of this research were analyzed descriptively and inferentially, explaining that there was a difference between students' understanding of the concepts of the experimental class and the control class, the results of the average score of the experimental class were 70% higher than the control class which had an average score of 60%. It can be concluded that the think pair share cooperative learning model using the index card match method can increase the conceptual understanding of class X students at SMAN 2 Singingi.

Keywords: *Concept Understanding, Think Pair Share, Index Card Match, Measurement*

1 Introduction

Education is an internal effort to develop the characteristics of human resources. where all countries generally provide education. Teachers as implementers are aware of the importance of the public school system. As experts, they should have compassionate skills, including educational, individual, social and specific expertise. To master these competencies, teachers must have the ability to understand and develop curriculum and learning (Fujiawati, 2016). Basically, every student has a curiosity to learn, it's just that each student has minimal awareness of it. Due to a lack of interest and motivation that encourages students to enjoy learning, a lack of self-confidence because they think it is difficult for them to understand the lessons being discussed, a less pleasant classroom atmosphere is one of the things that makes students less active, less enthusiastic in learning (Widyastuti, 2022).

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In Isty (2023) research stated that a good learning model is one that can foster students' interest and communication skills, good communication makes it easier for students to present observation results in accordance with the students' understanding. This is also one of the motivating factors for students to understand the material they have studied. The results of observations carried out by researchers at SMA N 2 Singingi by conducting interviews with physics teachers obtained information that students generally find it difficult to understand physics learning, because they think that the lesson is less fun and boring, so there is nothing that makes them interested in learning physics. Lack of curiosity and enthusiasm from students will make the learning process less enjoyable so that students' focus on the material being taught is reduced as a result of students not understanding any physics material taught by the teacher. Material that is quite difficult to understand in physics is estimation, which influences the value of how students can interpret ideas.

Physics is also a science that has an important role in improving human resources, one of which is to support technological development. Physics subjects should be able to develop students' potential in cognitive, affective and psychomotor development well. The ICM learning system is a great strategy because it welcomes students to be dynamic in learning. In its implementation, apart from the stressful student movements, it can also be seen from the participation of students in educating and developing experiences (Apriyanti et al., 2021). The think pair share type cooperative model is a learning model that emphasizes students to be more active in class, think independently and express their opinions in language that the students understand. Solve a problem by thinking independently, in pairs (in groups) then express the learning information obtained to other students well.

The teaching and learning process requires good cooperation from students, so that learning achievement can be achieved. Teachers as fundamental facilitators provide knowledge, skills, discussion partners in learning, encourage the courage to think alternatively in solving problems and as motivators of course play an important role in determining the progress of the process. Study. If the learning process is completed poorly, then the main goal of the learning process will not be easily achieved (M & Sarkit, 2023). One measure of the success of the learning process is how much students understand the concepts of the material they have studied. If students' understanding of concepts increases, of course the learning outcomes obtained will also increase. Based on the following description, it is hoped that the cooperative learning model Think Pair Share and the Index Card Match technique can improve students' understanding of concepts at SMA N 2 Singingi.

2 Research Methods

The research was conducted at SMAN 2 Singingi, from August to September 2023. This type of research is Quasi Experiment, using a Posttest Only Design, namely using one experimental class and one control class as shown in Table 1.

Table 1 Posttest only design research

Group	Treatment	Post test
Experiment	X	O ₁
control	-	O ₂

(Creswell, 2012)

The population in this study was all 214 students in class Sampling used a simple random sampling technique and the sample was determined through a normality test and also a homogeneity test in the population using SPSS 29 based on previous material test scores, namely scientific work. The sample in this study was class X6 as the experimental class and class X5 as the control class. The data obtained in this research is about students' conceptual understanding which was collected through posttest questions

after implementing the learning model. This posttest question consists of 20 questions which are arranged based on indicators of concept understanding, namely restating a concept, classifying objects, giving examples, presenting concepts in various forms of mathematical representation, developing necessary or sufficient conditions for a concept, exploiting, using, and choosing. procedure, Applying a problem solving concept or algorithm.

This research data analysis technique uses descriptive analysis and inferential analysis. The descriptive analysis discussed in this research looks at students' rational understanding as assessed from the posttest results. To calculate the understanding value obtained by students, the following conditions are used:

$$\text{Concept understanding} = \frac{\text{score obtained}}{\text{maximum score}} \times 100\% \quad (1)$$

The criteria for students' mastery of concepts according to the Ministry of National Education 2006 are shown in Table 2.

Table 2 Concept understanding criteria

Intervals (%)	Concept understanding category	Effectiveness category
$85 \leq x \leq 100$	Very good	Very effective
$70 \leq x < 85$	Good	Effective
$50 \leq x < 70$	Enough good	Effective enough
$0 \leq x < 50$	Not good	Less effective

(Depdiknas, 2006)

The researchers used inferential analysis to determine differences in students' rational understanding after using the Think pair share learning model with the index card match strategy in the experimental class and using conventional learning in the control class with hypothesis testing.

3 Results And Discussion

Data on the results of students' rational understanding were obtained from the results of the posttest on measurement material after applying the Think Pair Share model with the Index Card Match Strategy in class X6 as an experimental class and conventional learning in class X5 as a control class at SMAN 2 Singingi. The results of the posttest score analysis of students' conceptual understanding for each indicator in the experimental and control class measurement material can be seen in Table 3.

Table 3 Posttest score result for each indicator of student concept understanding

Indicator of concept understanding	Experimental class		Control class	
	Posttest score (%)	Category	Posttest score (%)	Category
interpret	69,52	Enough good	61,11	Enough good
Example	62,86	Enough good	55,56	Enough good
Classify	79,29	good	71,53	good
Summarizing	68,57	Enough good	58,33	Enough good
Inference	63,81	Enough good	58,33	Enough good
Compare	60,00	Enough good	48,61	Less good
Explain	83,81	good	65,74	Enough good
Mean	70	good	60	Enough good

Based on the data in Table 3, each indicator of conceptual understanding in the experimental class is higher than the control class. The average gain for the experimental class is 70%, which is in the good category, while the control class is 60%, which is also in the quite good category. So it shows that the application of the Think Pair Share learning model with the Index Card Match Strategy in the experimental class can improve students' conceptual understanding compared to the control class which uses conventional.

From the results of data analysis, understanding the concept of each indicator through the think pair share cooperative learning model and assisted by the index card match strategy can be seen in Figure 1:

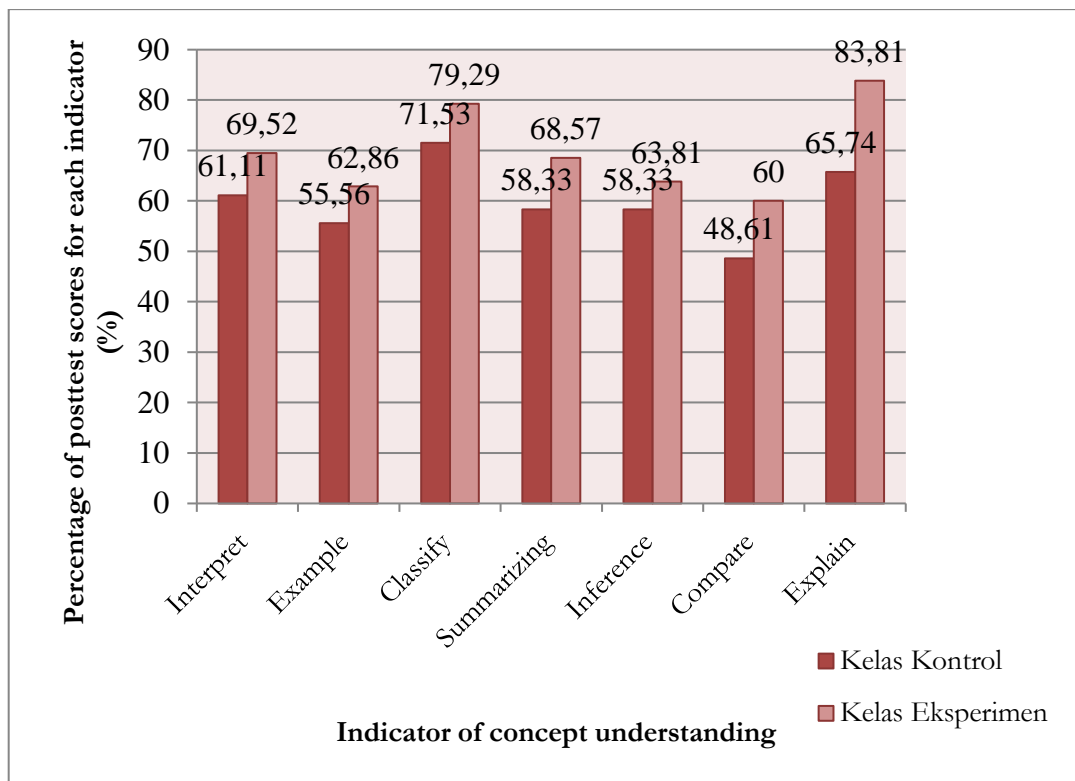


Figure 1 Graph of posttest score results for each indicator of concept understanding

The graph in Figure 1 shows that the percentage of posttest scores for each indicator in the experimental class and control class has different values. Explanations for each indicator will be explained as follows.

a. Interpret

Students' ability to change information is that they can change sentences into other sentences, images into sentences and so on, from words to numbers or vice versa, as well as from sentence to sentence. Based on the results in graph 1, the experimental class got an average score of 66.67, which was in the quite good category, the control class had an average score of 61.11, which was in the quite good category, but the experimental class scored higher than the control class. The indicator of achievement of the chosen interpreting is translating, namely translating sentences from laboratory illustrations to get to know what tools are used when carrying out a practicum to measure the diameter of an object and the depth of an object.

Likewise, the research results of (Novita et al., 2021) stated that the think pair share model has an effect on student learning outcomes, so that it can improve students' understanding of concepts to be better than before.

b. Give an example

Students' ability to provide detailed examples and identify general material concepts, provide examples of the ability to identify the characteristics of a concept and then make these characteristics into real examples using events in everyday life. Based on the results in graph 1 the experimental class got an average score of 62.86 which was in the quite good category, while the control class had an average score of 55.56 which was in the quite good category but the experimental class had a higher score than the control class.

The Indicators of achievement from example are giving examples which consist of giving examples of pictures of reading measuring instruments, giving examples of pictures of the parts of a screw micrometer, This is in accordance with research (Antoneta et al., 2023), which shows that student learning outcomes after implementing the Think Pair Share cooperative learning model showed that student learning outcomes increased and were in a better direction so that students' ability to understand concepts also improved.

c. Classify

Detecting characteristics or patterns starting from examples of certain categories of something and students are asked to get general concepts from these specific examples. Based on the results in graph 1, the experimental class got an average score of 79.29 which was in the good category, while the control class had an average score of 71.53 which was in the good category but the experimental class had a higher score than the control class. Indicators of achievement in classifying are grouping which consists of grouping derived quantities, grouping mass measuring instruments by showing several pictures of measuring instruments, grouping derived quantities and their units, grouping measuring instruments according to the object being measured.

This is in accordance with research by (Anggraeni et al., 2023) which shows that the TPS model is effective in improving students' mathematical communication skills and increasing students' ability to understand concepts.

d. Summarizing

Students have the ability to provide words in the form of information that states a general topic, summarizing includes constructing a representation of information, making a summary, for example determining the main theme or topic. Based on the results in graph 1 the experimental class got an average score of 68.57 which was in the quite good category, while the control class had an average score of 58.33 which was in the quite good category but the experimental class had a higher score than the control class. . Indicators of the achievement of summarizing are abstracting the consequences of errors in measurement, abstracting errors when conducting experiments using measuring instruments. Both the experimental and control classes had scores in the quite good category, although the average score for the experimental class was higher than the control class, this was due to the researchers not paying enough attention to the students in carrying out the experiment due to their lack of ability to control class conditions.

This is in accordance with research by (Pristiawati & Saiman, 2021) which states that it is able to provide more opportunities for students to think critically and creatively in responding to questions in TPS type cooperative learning with the help of index card match.

e. Draw inferences

The ability to look for patterns from several case examples, students can be said to be inferring if students can imagine concepts and principles from several parts of the example. Based on the results in graph 1 the experimental class got an average score of 63.81 which was in the quite good category, while the control class had an average score of 58.33 which was in the quite good category but the experimental class had a higher score than the control class. . Indicators of achievement from drawing inferences are through illustrations, it can be concluded that time measuring instruments, concluding the concept of dimensions,

This is in accordance with research by (Septiyani et al., 2018) which states that the application of the TPS model makes the class far from tension, making it easier for students to receive lessons well, understand the content of the material and mathematical communication skills so that the ability to understand students' concepts improve well.

f. Compare

The ability to find the relationship between two ideas or objects of the same thing. Based on the results in graph 1, the experimental class got an average score of 60.00 which was in the quite good category, and the control class had an average score of 48.61 which was in the not so good category so the experimental class had a higher score than the control class. . Indicators of the achievement of comparing are distinguishing meaning from errors in measurement, distinguishing the rules for writing significant figures.

These results are in accordance with the results of research by (Anugrah et al., 2023) which states that the TPS model has an influence on students changing their behavior which encourages increased learning outcomes and increased understanding of concepts as well.

g. Explain

Ability to instruct and study models or causes and effects of a system. Based on the results in graph 1, the experimental class got an average score of 83.81 in the good category, while the control class had an average score of 65.74 in the quite good category, so the experimental class had a higher score than the control class. Indicators of achievement in explaining are explaining the meaning of measurement, explaining the meaning of scientific notation, explaining quantities and units.

Likewise, the research results of (Masdini & Widiyowati, 2018) stated that with the ICM-assisted TPS model, students can more easily understand the content of the material, learn, increase active power and develop attitudes, knowledge and skills well.

According to Bloom, understanding is an effort including all types of activities that fall into the cognitive domain. Understanding concepts is a level of ability where students are expected to be able to understand the concept of learning material that has been given and be able to explain it again using their own words according to the insight and knowledge they already have without having to change the meaning of something (Suryani, 2019).

Use of the Think Pair Share cooperative learning model with the Index Card Match Strategy. Because students in class listen and copy what the teacher writes in front of them, the only source of learning for them is the teacher, learning activities also overcome the problem of students' lack of interest in learning. As a result, students are less motivated and less able to learn independently.

One of the reasons the learning process in the classroom does not go well is because the learning process is teacher-centred while student interaction between students does not occur, this makes the teacher play a dominant role in the ongoing learning process (Permana, 2023). Through the application of the 'Think Pair Share' cooperative learning model with the Index Card Match Strategy in increasing students' understanding of concepts, it shows that through the use of this learning model it has proven to be effective in learning activities, especially in fostering students' enthusiasm and interest in moving forward thereby broadening students' understanding in interpreting ideas due to the experience they have had. developing focused on students. This is in accordance with the 2018 physics education innovation journal, by Yunita Ayu Muji Astutik and Suliyanah with the title "Implementation of the 'TPS (Think Pair Share) Type Cooperative Learning Model by Integrating the Index Card Match Strategy to Improve Student Learning Outcomes on the Subject of Heat Transfer in Class X SMAN 1 Puri Mojokerto". in this journal, it is stated that the implementation of the 'TPS' cooperative learning model through the index card match strategy has been responded well by students and can improve student learning outcomes seen from the knowledge aspect. The average value of control and experimental class students, experimental class students have higher scores than control class. , so that it can be said that this learning model has been implemented well (Astutik, 2015).

Looking at the description of the discussion above, it is known that one of the indicators of understanding the concept, namely explaining, in the experimental class has a good category, while in the control class it has a fairly good category. There is quite a big difference, namely 18%, this is due to the different learning model treatment, the control class was given treatment using a conventional learning model which in the process used the lecture, question and answer method, while the experimental class applied the think pair share cooperative learning model using the index strategy. card matches. The implementation of the learning model has 3 stages that involve students actively during the learning process, making it possible for a fun learning process to occur with the help of the index card match strategy aimed at making students remember more, be active, and have an interesting atmosphere in the class and understand the material being taught. students who can foster students' knowledge construction better. If students' knowledge construction increases, it will encourage students' conceptual understanding of the material being taught.

4 Conclusion

Judging from the results of data analysis in the discussion of understanding the concept of Physics in class X5 and X6 SMA N 2 SINGINGI, it can be concluded, namely:

1. Students' understanding of physics science concepts who learn using the think pair share cooperative learning model is higher using the index card match strategy compared to students' understanding of concepts using conventional learning models. Indicators in the highest category are indicators at the explaining level, while indicators in the low category are indicators at the comparing level.
2. There was a significant increase between students' understanding of physics science concepts using the think pair share cooperative learning model using the index card match strategy and students' understanding of physics science concepts using the conventional learning model. It can be concluded that the think pair share cooperative learning model using the index card match strategy can help students understand physics science concepts.

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