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Think Pair Share Type Cooperative Learning to Improve Chemistry Learning Outcomes on Atomic Structure Material

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ABSTRACT

Purpose of the study: The purpose of this research is to improve student learning outcomes in learning atomic structure at Dar El Hikmah Pekanbaru Vocational School by using the think pair share type cooperative learning method.

Methodology: The subjects of this research were 24 class X students majoring in Information Technology at Dar El Hikmah Vocational School, Pekanbaru, consisting of female students. In carrying out this classroom action research, there are two types of data collected by researchers, namely quantitative data and qualitative data. This research data collection technique uses tests, observation and interviews. The data analysis technique for this research was analyzed descriptively using the percentage technique of students' absorption of the material per cycle.

Main Findings: The results of data analysis show that in general students' absorption of learning material shows an increase, this is based on the evaluation results of 61.7% who have not reached the minimum completeness criteria in cycle I, increasing to 67.54% in cycle II and increasing again to 76.7% in cycle III. The average value of daily test results has also increased. This is shown by the average daily class test results from 60.6, which had not yet reached the minimum completeness criteria score in the previous year, to 73.33 after implementing Think Pair Share type cooperative learning. From the research results it can be concluded that implementing Think Pair Share type cooperative learning can improve student learning outcomes.

Novelty/Originality of this study: The novelty of this research is to determine the effectiveness of implementing Think Pair Share type cooperative learning to improve chemistry learning outcomes regarding atomic structure.

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1. INTRODUCTION

Learning is essentially a teacher's activity in teaching students, which means creating or placing students in a learning condition [1]–[3]. Students in learning conditions can be observed and observed through the activities they carry out, namely focused attention, enthusiasm, asking, answering, commenting, presenting, discussing, trying, guessing, or discovering [4]–[6]. In implementing learning, teachers need to design appropriate strategies, namely the way teachers organize the entire learning process [7]–[9].

Teaching orientation in the teaching and learning context is directed at developing student activities in learning [10]–[12]. The description of the development of the activity is reflected in the efforts made by the teacher. Therefore, teaching is not just conveying ready-made information, by guiding verbal answers, but is an integrative effort towards achieving educational goals [13], [14]. The task of teaching for teachers is not just to convey information through teaching whose mastery is assessed in the form of the ability to recall what has been taught, but to use teaching as a vehicle to provide a systematic sequence for achieving the overall goals of education, in order to create a better future [15], [16].

Therefore, teachers are required to be able to design and implement learning experience programs appropriately so that students gain complete knowledge so that learning becomes meaningful for students. The teacher's main task is no longer to convey knowledge, but rather to provide understanding, guiding them to learn on their own [17]–[19]. Teachers are required to be able to develop the potential of students so that they can carry out tasks actively according to their level of development [20]–[22]. For this reason, a conducive learning condition is needed that allows all students to feel happy and challenged to carry out learning activities so that they can improve their learning achievement [23], [24] .

Chemistry learning in secondary schools often does not match the ideal concept, and this also happens at Dar El Hikmah Pekanbaru Vocational School, especially in class X which is the focus of the research. Some symptoms that reflect this reality include the dominance of the lecture method approach and giving assignments in every lesson. Communication in the classroom is one-way, where the teacher is more active without active participation from students. This is because teachers have not planned chemistry learning using an approach that can activate students, because it is considered an approach that is confusing and takes a lot of time.

Apart from that, students tend to be less responsible in the learning process, which has an impact on low learning outcomes. As many as 10 of the 27 students in the class got low test scores with an average of 58, which is still far from the Minimum Completeness Criteria value set at 65. This phenomenon shows the need to formulate more effective learning strategies to increase absorption capacity. students towards chemistry material. Therefore, this research was conducted to find a solution through the application of the Think Pair Share type cooperative learning model.

In connection with the problems above, efforts to improve the quality of chemistry learning at Dar El Hikmah Pekanbaru Vocational School are a very urgent need to be carried out. One learning strategy that is thought to be able to bridge this problem is the Think Pair Share type cooperative learning model. Where this learning emphasizes the use of certain structures designed to influence student interaction patterns that require students to work together and help each other in small groups. Cooperative learning can motivate students to engage in mutual interaction, compassion, and care between fellow students as a practice for life in real society [25]–[27].

Previous research examining the application of the think pair share type cooperative learning model by Kartini [28] can be concluded that there is an influence of the think pair share type cooperative learning model on student learning outcomes. In line with that, implementing think pair share type cooperative learning can improve student learning outcomes [29]. This research is in line with previous research, namely applying think pair share type cooperative learning to improve chemistry learning outcomes on atomic structure material. The novelty of this research is to determine the effectiveness of implementing think pair share type cooperative learning to improve chemistry learning outcomes regarding atomic structure.

This research is very important because the application of Think Pair Share type cooperative learning has the potential to significantly improve student learning outcomes in atomic structure material in Chemistry subjects, which is an important basic concept for advanced understanding in science. Cooperative learning has a very positive impact on students with low learning outcomes [30]–[32]. Learning from friend to friend can reduce fear and be more relaxed so that it can increase motivation and retention (storage) of study material for longer so that student learning outcomes can also improve. Based on the description above, researchers are motivated to conduct research on improving student chemistry learning outcomes through Think Pair Share type cooperative learning for class X students at Dar El Hikmah Vocational School Pekanbaru. The aim of this research is to improve student learning outcomes in learning atomic structure using the Think Pair Share type cooperative learning method.

2. RESEARCH METHOD

2.1 Types of Research

This research is classroom action research. This class action design has a procedure consisting of three cycles. Each cycle is carried out in accordance with the desired changes. This was done to see an increase in student learning outcomes in participating in atomic structure learning by implementing think pair share type cooperative learning. The activities that will be carried out in each cycle are planning, implementing actions, observing, analyzing and reflecting [33], [34].

2.2 Research Subjects and Objects

The subjects of this research were 24 class X students majoring in Information Technology at Dar El Hikmah Pekanbaru Vocational School, consisting of female students. Meanwhile, the object of this research is student learning outcomes in learning atomic structure using the Think Pair Share type cooperative learning model.

2.3 Types and Techniques of Data Collection

In carrying out this classroom action research, there are two types of data collected by researchers, namely quantitative data and qualitative data. Quantitative data is student learning outcomes which can be seen from the evaluation of student learning outcomes in each cycle and the results of students' daily test scores before and after taking action. Qualitative data, namely data in the form of information in the form of sentences that provide an overview of student and teacher activities related to the implementation of actions such as the level of understanding of the material and students' views or attitudes towards the use of media in the teaching and learning process. Data collection techniques in this research used tests, observations and interviews.

2.4 Data Analysis Technique

The data analysis technique in this research was analyzed descriptively using the absorption capacity percentage technique students towards the material per cycle. When conducting research, researchers make observations of Learning activities are about the process and products of implementation application of Think Pair Share type cooperative learning. From the results of observations the teacher can reflect on the implementation of actions and analyze and make conclusions about the implementation of learning, what the learning is has been packaged using the Think Pair Share type cooperative learning model can increase or improve student learning outcomes.

3. RESULTS AND DISCUSSION

3.1. Cycle I

At the end of the first cycle, it can be seen from the observations of researchers and collaborators that students are not yet accustomed to learning using the Think Pair Share learning model, and have not actively participated in the learning process. The results of the evaluation of students' mastery of the learning material in this first cycle can be seen in the table below.

Table 1. Results of Cycle I Data Analysis

Acquisition value	The number of students	Individual Absorption Capacity
40	3	40%
50	3	50%
60	10	60%
70	3	70%
80	5	80%
Classical Absorption Capacity = 61.67%		

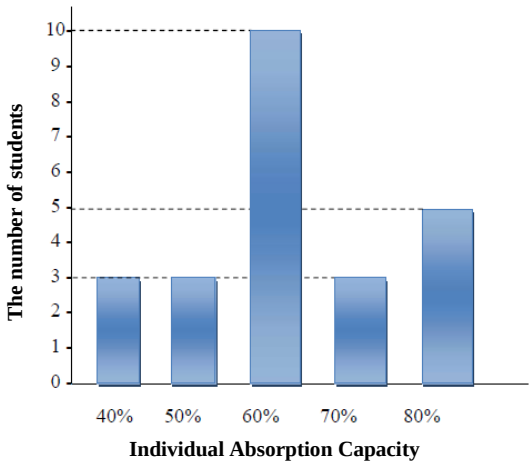

Figure 1. Graph of Individual Absorption Capacity Cycle I

From the analysis results in table 1, students' absorption of the material is still relatively low. Of the 24 students, it appears that only 8 students have achieved completion, while the other 16 students have not yet

completed it. And the classical average absorption capacity is only 61.67% and has not yet reached the minimum completeness criteria value. After getting the results of the data analysis above, the author reflected on the meeting in the second cycle by arranging the students' seats and determining student pairs and giving awards to the groups who appeared in front of the class.

3.2. Cycle II

In this second cycle, students have begun to have the courage to answer and are confident in thinking about filling in the student worksheet. Students are already sitting in the places that have been arranged, and some pairs are ready to report the results of their work to the front of the class. At the end of the second cycle, it can be seen from the observations of researchers and collaborators that the learning process has shown progress compared to the first meeting. The results of the evaluation of students' absorption of learning material in the second cycle can be seen in table 2 below.

Table 2. Results of Cycle II Data Analysis

Acquisition value	The number of students	Individual Absorption Capacity
47	2	47%
53	2	53%
60	2	60%
67	8	67%
73	5	73%
80	5	80%
Classical Absorption Capacity = 67.54%		

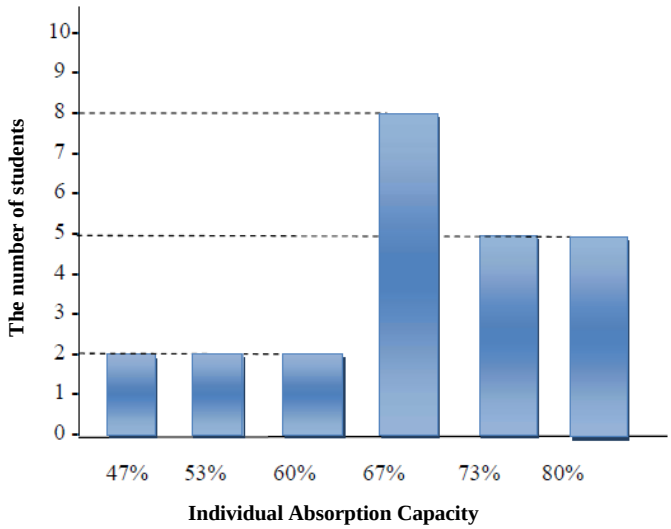

Figure 2. Graph of Individual Absorption Power Cycle II

From the results of the analysis in table 2, students' absorption of material in the second cycle has started to be better than the first cycle. Of the 24 students, it was seen that 14 students had achieved completeness, while the other 10 students had not yet completed it. And the classical average absorption capacity has reached the minimum completeness criteria value, namely 67.54%.

3.3. Cycle III

The learning process in the third cycle has been carried out well, and is in accordance with the Think Pair Share type learning steps. Almost all students can think for themselves to answer the worksheet, and when they work in pairs, students work together well and share without being asked by the teacher. In the final stage, each pair also shares with the whole class and reports the results of their work. At the end of the third cycle, learning outcomes had met expectations, namely an increase in student learning outcomes from the previous cycle. The results of the evaluation of students' absorption of learning material in the third cycle can be seen in table 3 below.

Table 3. Results of Data Analysis for Cycle III

Acquisition value	The number of students	Individual Absorption Capacity
60	1	60%
70	10	70%
80	9	80%
90	4	90%
Classical Absorption Capacity = 76.7%		

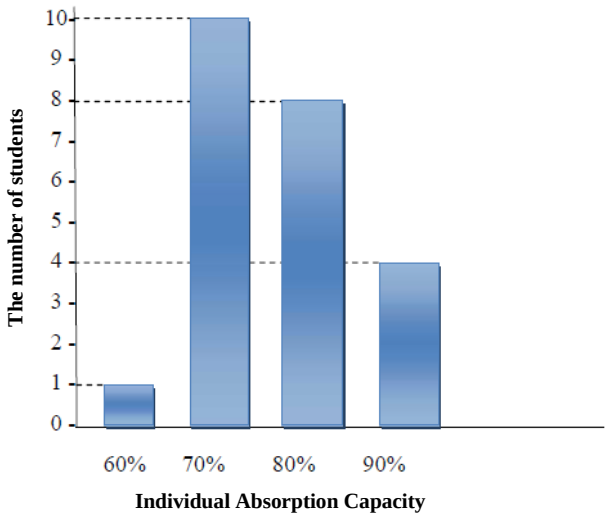

Figure 3. Graph of Individual Absorption Capacity for Cycle III

The results of the evaluation of students' mastery of learning material in this third cycle, 23 students have achieved the minimum completeness criteria score and only 1 student has not achieved completeness. Students' absorption of classical material also increased, namely 76.7%. Based on the results obtained from the third cycle, it can be seen that there has been an increase in student learning outcomes and they have achieved the desired targets. So the researchers stopped in the third cycle. After there was an increase in the third cycle, the next meeting held a daily review to see how far the students' absorption of the material was after the action was implemented. The results of data analysis after implementing the action showed that the average daily test score after implementing learning with the Think Pair Share type was 73.33, while the daily score on the same material before implementing learning with the Think Pair Share type was 60.6.

The implementation of learning using Think Pair Share type cooperative learning in this research is managed based on the research lesson plan. The learning process begins by giving the group awards obtained in previous learning, then conveying the learning indicators that must be achieved. Overall the research results show an increase in each cycle. This increase is due to the Think Pair Share type of cooperative learning, students will learn actively and can foster learning motivation in students by giving rewards to the group. Based on the research results, the development and appreciation value of each group has increased. There is 1 group of couples who got an average development score of 25 with a super group award in the first cycle. In the second cycle the couples who received the super award had increased to 4 groups. And in the third cycle this increased again to 5 couples who received the super group award. A recap of the development and reward values for each pair of cycles can be seen in the following table.

Table 4. Recapitulation of Development in Think Pair Share Pairs

Award	Cycle I	Cycle II	Cycle III
Super	1 group	4 groups	5 groups
Great	7 groups	6 groups	5 groups
Good	4 groups	2 groups	2 groups

Based on the results of data analysis in the application of Think Pair Share type cooperative learning, it shows that students' ability to understand atomic structure material is satisfactory. Student learning outcomes in the first cycle, the average student absorption capacity classically was only 61.67% and had not yet reached the minimum completeness criteria score (65), then in the second cycle the average student absorption capacity classically had reached the Minimum Completeness Criteria score, namely 67 , 13% . And in the third cycle it increased again to 76.7%. From the classical student learning results obtained, it can be seen that after implementing the Think-Pair Share type cooperative learning model and at each cycle change, classical learning

completeness increases. A recapitulation of student learning outcomes for each cycle can be seen in the following table.

Table 5. Recapitulation of Student Learning Results

	Learning outcomes		Classical Absorption Capacity
	Highest	Lowest	
Cycle I	80	40	61.67%
Cycle II	80	47	67.54%
Cycle III	90	60	76.7%
Daily tests	90	65	73.3%

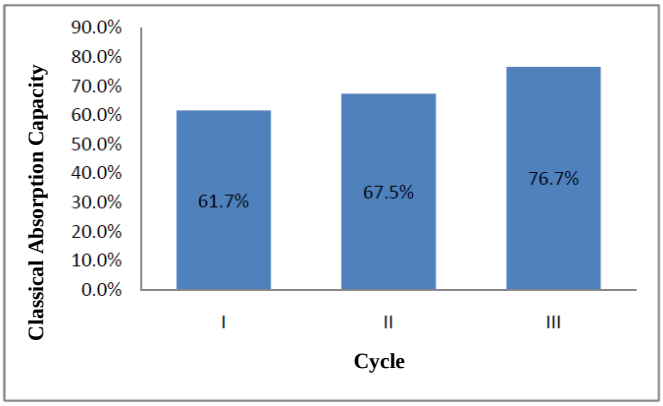

Figure 4. Classical Absorption Power Graph

Students' mastery of learning material also showed an improvement from the previous year. This can be shown by the average daily test results. This shows that the application of Think Pair Share type cooperative learning can improve student learning outcomes, especially on the subject of atomic structure which is carried out at the Dar El Hikmah Islamic Boarding School Vocational School. This is in line with previous research which states that implementing think pair share type cooperative learning can improve student learning outcomes [35], [36]. Thus, the results of this action analysis support the action hypothesis, namely that the application of think pair share type cooperative learning on the subject of atomic structure can improve student learning outcomes.

Thus, the application of think pair share type cooperative learning can be used as an effective tactic to improve student learning outcomes. By implementing think pair share type cooperative learning, students can build and discover their own knowledge by conducting discussions and answering student worksheets. Students are responsible and work together on the assignments given, and share information with each other in the group so that each group member knows and understands the answers to questions from the assignments given.

This research has significant implications for improving teaching methods in the field of chemistry education. With results showing a significant increase in students' understanding of atomic structure material through the application of Think Pair Share type cooperative learning, this research provides strong evidence that this method is effective in improving student learning outcomes. The implication of these findings is that chemistry teachers and other educators can consider integrating the Think Pair Share learning model into their curriculum to create a more interactive and effective learning environment. Apart from that, these findings also open up opportunities for further research to test the effectiveness of this method on various subject matter and other educational levels, in order to expand the application and benefits of Think Pair Share type cooperative learning in a broader educational context.

This study has several limitations that need to be noted. First, this research was only conducted in one class with a relatively small number of subjects. Second, external factors such as students' academic background, supportive learning environment, and variations in individual learning styles were not analyzed in depth, which may influence the research results. For future research, it is recommended that similar studies be conducted with larger and more diverse samples, including students from different backgrounds and different levels of education. In addition, long-term research covering more cycles needs to be conducted to gain a more comprehensive understanding of the effectiveness and sustainability of the Think Pair Share method in improving student learning outcomes.

4. CONCLUSION

Based on the results of the research and discussion, it can be concluded that the application of think pair share type cooperative learning can improve student learning outcomes on the subject of atomic structure at the

Dar El Hikmah Pekanbaru Islamic Boarding School Vocational School. Students' absorption of learning material showed an increase, this was based on the evaluation results, 61.7% of those who had not reached the minimum completeness criteria in cycle I increased to 67.54% in cycle II and increased again to 76.7 in cycle III. The average value of daily test results has also increased. This is shown by the average daily class test results from 60.6, which had not yet reached the minimum completeness criteria score in the previous year, to 73.33 after the implementation of think pair share type cooperative learning. By implementing think pair share type cooperative learning, learning the subject of atomic structure is more fun. Apart from that, implementing think pair share cooperative learning can train students to have thinking skills and social skills. It is recommended that Think Pair Share type cooperative learning continue to be applied in teaching atomic structure because it has proven effective in improving student learning outcomes.

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