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Effective Strategy: Talking Stick Cooperative Learning to Improve Understanding of Chemical Bonding

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ABSTRACT

Purpose of the study: This study aims to evaluate the effectiveness of implementing the Talking Stick Cooperative Learning Model in improving the learning outcomes of Class X 2 students at Rangsang 1 State Senior High School, located in Rangsang District, Meranti Islands Regency, on the topic of Chemical Bonds.

Methodology: This study is a Classroom Action Research. The subjects of the study were 38 students of Class X 2 at Rangsang 1 State Senior High School, located in Rangsang District, Meranti Islands Regency, consisting of 24 male students and 14 female students. The instruments used were learning activity tools and student learning outcome tests. The data analysis technique in this study employed descriptive analysis.

Main Findings: Based on data analysis, the students' learning mastery before the intervention was 53.95, which increased to 64.74 in Cycle I, 73.42 in Cycle II, and 79.47 in Cycle III, showing a significant improvement. Thus, the data analysis results conclude that the implementation of the Talking Stick Cooperative Learning Model can enhance the chemistry learning outcomes of Class X2 students at Rangsang 1 State Senior High School, Rangsang District, Meranti Islands Regency.

Novelty/Originality of this study: This study provides novel insights into the effectiveness of the Talking Stick Cooperative Learning Model in significantly enhancing student learning outcomes in chemistry, particularly on the topic of chemical bonds, within the context of a rural high school setting.

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1. INTRODUCTION

Learning is an individual's effort to achieve comprehensive behavioral change, which comes from personal experience in interacting with his environment [1]-[3]. Learning is an effort to teach students to gain knowledge, involving mental and psychological activities that occur through interaction with the environment [4]-[6]. This process results in behavioral changes in individuals through interactions between individuals and their surroundings. Chemistry is one of the subdisciplines in Natural Sciences (IPA) that has a significant role among other branches of science. Chemistry focuses on research into the properties, composition, structure, and changes in matter, and pays attention to the energy involved in the process of changing matter [7]-[9].

One of the educational problems faced by the Indonesian nation is the low quality of education at every level of education, especially primary and secondary education. Various efforts have been made to improve the quality of national education, such as improving the quality of teachers and school management itself [10]-[12]. Education is one form of manifestation of dynamic human culture which is full of change and development [13]-[15]. Changes and developments in the sense of improving education need to be carried out continuously in anticipation of future interests [16].

Learning activities are not only focused on efforts to gain as much knowledge as possible, but also on how to use all the knowledge gained to face new situations or solve specific problems related to the field of study being studied. Because basically, the ultimate goal of learning is to produce students who have the knowledge and skills to solve problems faced in the future in society. In the entire educational process in schools, learning activities are the most basic activities. This means that the success or failure of achieving educational goals depends largely on the learning process experienced by students as students.

The learning process is a communication process between teachers and students and between students [17]-[19]. The communication that is established should be a two-way communication that is created in such a way that the message delivered in the form of learning materials is effective and efficient. In the learning process, the teacher acts as a facilitator, motivator, and guide who provides knowledge and skills to improve students' learning abilities [20]-[22]. Teachers should understand how to deliver good lesson materials, have the right strategies, and use appropriate media and teaching aids so that learning objectives can be achieved, therefore a teacher must be able to choose the right method to create a good teaching and learning process.

Basically there is no single method that suits all students [23], [24]. Some people like to study on their own, some people prefer to listen to explanations and information from teachers through lecture methods. Each child needs their own method that suits them [25]-[27]. In creating a quality atmosphere in learning, it is inseparable from the role of teachers in using approaches in the teaching and learning process. The approach used by teachers in the teaching and learning process will be successful if the method used is in accordance with the material to be taught.

Basically in learning, teachers must have certain strategies and approaches to students that aim to improve student motivation and learning outcomes. Basically, strategies and approaches are not the same. Strategy is a strategy applied to solve a problem, while an approach is an effort and application of steps or ways of working by applying a strategy and the right method, which is carried out according to systematic steps to obtain better work results.

Learning is essentially an educational practice that is not simple, especially in relation to the quality of graduates. Education and learning are concepts in the social field that are usually related to processes and products [28]-[30]. The improvement of the learning process greatly affects the quality, both the final product and the process that is carried out so that if one of these factors experiences obstacles, the process will not run effectively. The quality of learning as the final product is the best way to directly detect or as an indicator of the learning process. How to improve the learning process can be done by realizing values that can ultimately form an action, usually including the continuation of the reflection process from practitioners. In this framework, the need for classroom action research is used as one of the solutions to improve the process and quality of learning.

The reality in the field shows that most students' mastery of chemistry lessons, especially on the topic of chemical bonds, is still low, this is because many students still have difficulty understanding chemistry lessons. Therefore, an educator, in the teaching and learning process must be able to use learning strategies in such a way that chemistry lessons can be understood by students. The way of teaching is greatly influenced by his understanding of learning. Specifically in the teaching and learning process, teachers act as teachers, mentors, intermediaries between schools and the community, administrators and others.

Based on the results of the author's interview with chemistry teachers at Rangsang 1 State Senior High School, various problems related to chemistry lessons were revealed, and students' chemistry learning outcomes were still low. Even though the teacher concerned in the teaching and learning process had applied learning methods such as lecture methods, question and answer methods, discussion methods and so on, student learning outcomes were still low, this can be seen from the following symptoms: a. There are still low daily student grades or student test results that are less than satisfactory, namely below the average of 65%, b. If given a test other than the example in learning, many students are confused in completing it, c. Every time an assignment is given, only some students answer correctly, d. Due to low learning outcomes, many students end up having to undergo remedial classes.

Efforts that have been made to improve student learning outcomes include: 1) Organizing orderly learning in class, 2) Fostering discipline in the teaching and learning process, 3) Using approaches in the teaching and learning process, such as using learning methods, 4) Using teaching aids in the teaching and learning process with the aim of making students remember the lesson longer. However, the efforts that have been made by teachers have not achieved the expected goals, this situation shows that improvements are still needed in learning so that student learning outcomes can improve. One learning model that can be used to develop and activate student activities in expressing ideas and opinions in learning is to use a cooperative learning model. Cooperative learning

is a learning model designed to teach academic skills (academic skills), as well as social skills (social skills). Cooperative learning is social learning, where learning with group work is directed by the teacher where the teacher sets tasks and questions and provides information materials designed to help students solve the problems in question.

Previous research conducted by Eymur&Geban [31], focused on the integration of cooperative learning with conceptual change approach to improve students' understanding of chemical bonding concept. The approach aims to overhaul misconceptions through group work and cognitive interaction. Meanwhile, the current research, emphasizes the effectiveness of Talking Stick method as a cooperative learning strategy that combines physical activity and active involvement of students in understanding the chemical bonding concept. The main difference between the two studies lies in the implementation strategy of cooperative learning: the previous study prioritized conceptual change, while the current study emphasizes physical involvement and dynamic interaction through Talking Stick aids. This analysis shows that Talking Stick approach can be a more practical and interesting alternative to increase students' engagement, without neglecting the goal of reducing misconceptions.

The novelty of this study lies in its focus on applying the Talking Stick Cooperative Learning Model to improve students' understanding of chemical bonds, a fundamental yet challenging topic in chemistry education. Unlike traditional teaching methods, this model emphasizes active student engagement and collaborative learning, which are proven to enhance critical thinking and knowledge retention. The urgency of this research is underscored by the need to address low learning outcomes in rural schools, such as Rangsang 1 State Senior High School, where limited access to innovative teaching strategies often hampers academic achievement. By demonstrating the effectiveness of this approach, the study offers a practical solution to improve chemistry education, particularly in under-resourced areas. This study aims to evaluate the effectiveness of implementing the Talking Stick Cooperative Learning Model in improving the learning outcomes of Class X 2 students at Rangsang 1 State Senior High School, located in Rangsang District, Meranti Islands Regency, on the topic of Chemical Bonds.

2. RESEARCH METHOD

2.1. Research Subject

The subjects in this study were 38 students of class X2 Rangsang 1 State Senior High School, Rangsang District, Meranti Islands Regency, consisting of 24 male students and 14 female students. Meanwhile, the object of this study was to improve the learning outcomes of class X2 students of Rangsang 1 State Senior High School, Rangsang District, Meranti Islands Regency, especially on the topic of chemical bonds.

2.2. Research Design

This study is a Classroom Action Research (CAR). Classroom Action Research is a research in the social field, which uses self-reflection as the main method, carried out by the people involved in it and aims to make improvements in various aspects. The direction and purpose of the research from the classroom actions carried out by the teacher are for the benefit of students in obtaining satisfactory learning outcomes. In classroom action research there are 4 (four) important stages carried out, namely, (1) planning, (2) implementation, (3) observation or observation and, (4) reflection.

2.3. Data Collection Technique

In this study, data collection was carried out through two types of instruments. The learning activity instruments or learning devices used include syllabus, Lesson Implementation Plan, and Student Worksheet. The data collection instrument in this study was a test of student learning outcomes on the topic of chemical bonds. Data collection techniques in this study used observation techniques, documentation techniques, and test techniques.

2.4. Data Analysis Technique

The data analysis technique in this study used descriptive analysis where data analysis on teacher and student activities was the result of observations during the learning process by looking at the suitability between planning and implementation of actions. The completeness of student learning outcomes is seen from student learning outcomes on the topic of chemical bonds by looking at students' learning abilities individually and classically. In this study, the target to be achieved is individual student learning outcomes ≥ 65% and classically ≥ 75%.

3. RESULTS AND DISCUSSION

3.1. Descriptive Analysis

3.1.1. Observation before action

Based on the observation results, for the meeting before the action in general it was seen that the teacher's activities in the learning process could be carried out well, but for students the learning process carried out using the lecture method made students quickly bored and tired which was seen in the many students who did not listen to the teacher's explanation, there were still many students who were noisy so that when they were given the task of completing the LKS they felt it was difficult and confusing, there were still students who did not work on the LKS given by the teacher and students did not participate enough in the learning process.

3.1.2. Cycle I observation

Based on the observation results for cycle I, in general, it can be seen that teacher activities in implementing the Talking Stick cooperative learning model have been in accordance with the planning, this can be seen from the activities that have been carried out properly, but there are still things that need to be improved, especially the lack of teacher guidance for students in managing the discussion process and allocating time as well as possible. Meanwhile, there are still students who seem noisy, pay less attention when the teacher explains the material, are less serious in explaining the material to their friends and there are still several groups where only one person is working on the LKS while the other members are noisy, so that a lot of time is used to work on the LKS, when running the stick it is still less focused because the stick is stopped at a certain friend.

3.1.3. Cycle II observation

Based on the observation results for cycle II, in general, it can be seen that the teacher's activities in implementing the Talking Stick cooperative learning model have been in accordance with the planning, this can be seen from the activities that have been carried out properly, but there are still things that need to be improved, namely guiding and reminding students to pay attention when the teacher explains the lesson material. While student activities, namely students pay less attention to the teacher's explanation and there are still students who joke with their friends, and in running the stick it has been directed as it should.

3.1.4. Cycle III observation

In the data analysis obtained from the observation sheets of teacher and student activities in general from the observation sheets of cycle III, it can be concluded that teacher activities are better than before. This can be seen from the teacher's activities are in accordance with what was previously planned. While student activities can be said to be better. This can be seen from the way students follow Talking Stick cooperative learning and from the way students run the stick and discuss with their group members.

3.2. Analysis of Learning Outcome Completion

The average learning outcomes of students before the action were 53.95, in cycle I it was 64.74, in cycle II it was 73.42, and in cycle III it was 79.47. From the average results obtained, it can be seen that after the Talking Stick cooperative learning model was implemented and each cycle change, the average learning outcomes of students increased. This increase can be seen in Figure 1.

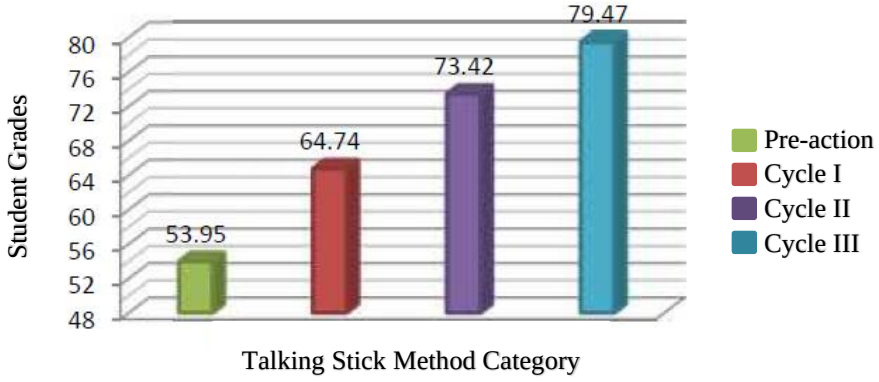

Figure 1. Graph of students' average scores

While the students' learning completeness classically before the action was 38.84%, in cycle I it was 52.63%, in cycle II it was 73.42%, and in cycle III it was 84.21%, from the results of students' learning classically obtained it can be seen that after the implementation of the Talking Stick cooperative learning model and each cycle change, the learning completeness classically increased. This increase can be seen in Figure 2.

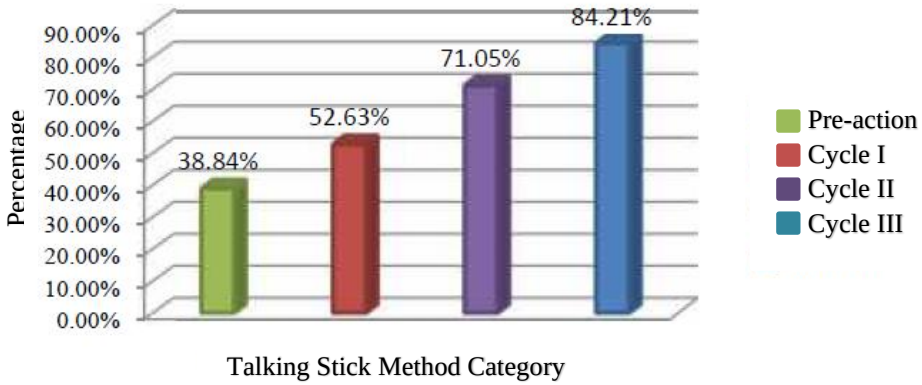

Figure 2. Graph of classical completion results

In this study, there was an increase in student learning outcomes. The learning process is essentially to develop activities and education through various interactions and learning experiences. One of them is providing opportunities for students to answer and ask questions in the teaching and learning process, so that a teacher can find out the ability of student learning outcomes and can measure how much material is able to be captured by students. Talking Stick is learning where students are able to express their opinions according to the concepts or materials that have been taught.

In addition, in the Talking Stick method, students get the same opportunity to express their opinions and reduce the dominance of certain students in determining the answers. Each student can also compare the original answer given by their friend with their own answer. Students can also ask about the material, explain to their friends and respond to the answers given by their friends. Students who already understand become more knowledgeable because they explain to their friends and students who do not understand are helped to understand the lesson material. If they already understand the lesson material, then students can work on the learning outcome test questions well. Based on the description above, the learning process with the Talking Stick method can improve student learning outcomes.

Research on the Talking Stick cooperative learning strategy to improve understanding of chemical bonds can provide positive impacts, such as increased student engagement in discussion and collaboration, and a deeper understanding of the concept of chemical bonds through active interaction. This strategy can also strengthen students' communication skills and improve critical thinking skills. However, there are several limitations, such as reliance on group dynamics that can vary, and potential challenges in managing discussion time so that all students can participate equally. In addition, the success of implementing this strategy is highly dependent on the teacher's ability to manage the classroom and facilitate discussions effectively.

4. CONCLUSION

Based on the results of the study conducted on students of class X2 of Rangsang 1 State High School, Rangsang District, Meranti Islands Regency, it shows that the application of the Talking Stick Cooperative learning method can improve student learning outcomes on the subject of chemical bonds. Talking Stick cooperative learning implemented in class X2 of Rangsang 1 State High School, Rangsang District, Meranti Islands Regency can make students more active in learning, and involve group cooperation that can help improve student learning outcomes. The study showed the influence of student learning outcomes as indicated by an increase in the completeness of student learning outcomes from before the action to cycle III of 79.47%, where in the pre-action 38.84% cycle 1 only 52.63% and cycle II of 71.05%. Further research is recommended to test the application of the Talking Stick strategy in various other chemistry learning contexts and compare it with other cooperative learning methods to assess its effectiveness in improving understanding of more complex chemistry concepts.

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