Analysis of the Application and Correlation of the Murder Type Collaborative Learning Model on Student Learning Outcomes at Senior High School Jambi

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Article Info

ABSTRACT

Purpose of the study: This study aims to determine the applicability of the MURDER type collaborative learning model and the relationship between the implementation of this model on student learning outcomes.

Methodology: The design used in this study is the Mix Method. Sampling was carried out by purposive sampling in senior high school 4 Jambi City. The instrument used is the observation sheet and questions. Before the test was carried out, the questions were tried to determine the validity, difficulty level, discriminating power, and reliability of the questions. The prerequisite test used normality and homogeneity tests, while the analysis used Bivariate and Pearson correlation.

Main Findings: The results of this study indicate that the implementation of the model by teachers and students through qualitative results is exemplary, with an average quantitative result each for teachers is 78.125% and for students is 70.29%, followed by an average student learning outcomes that reach 75,26. The result of the correlation test is $R = 0.717$ with a significance value of $0.000 < 0.05$, which means that there is a significant correlation, while the contribution of the R Square value is 0.514, which means that the implementation of the *MURDER* type collaborative learning model, contributes to Learning Outcomes of 51.4 %.

Novelty/Originality of this study: The novelty of this study is the focus on analyzing the application of the *MURDER* type collaborative learning model and determining its correlation to student learning outcomes at senior high school 4 Jambi City on the subject of reaction rates.

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1. INTRODUCTION

Learning is a process of interaction between students and teachers, delivery methods, learning strategies, learning materials, and learning resources in a learning environment [1]–[3]. Learning plays an important role for students at every level of education, including high school in order to gain knowledge. One of the subjects that must be studied for students who choose specialization in science is chemistry. Chemistry is a science with complex and abstract material, so students have difficulty understanding abstract concepts at the submicroscopic level [4]–[6]. In general, the chemistry learning process still seems boring because the teacher only explains the material, while students only listen and do exercises in books [7], [8]. Therefore, it is necessary to vary the

appropriate learning model so that it can increase the effectiveness of learning in the classroom [9]–[11]. One variation of the learning model that can be applied is the *MURDER* collaborative learning model.

The *MURDER* collaborative learning model is group learning that focuses on processes with the principle of shared learning to achieve common goals by applying *MURDER* learning steps [12], [13]. According to [14]–[16] the *MURDER* type learning model consists of six steps in its implementation, namely mood, understand, recall, detect, elaborate, review. Mood can be applied by creating a positive mood while learning, understand can be done by re-reading the material provided then marking parts that are not understood, recall means rearranging information that has been received, detect is done by utilizing other learning resources to solve problems, elaborate is done by developing the subject matter that students have received, for example by making other questions related to the material so that it requires students to be able to think analytically, review means studying again the subject matter that has been studied. The *MURDER* collaborative learning model is still rarely applied by teachers, this is evidenced by the results of interviews with chemistry teachers at senior high school 4 Jambi City, it is known that teachers still use the direct delivery model followed by giving practice questions so that students do not only accept what is conveyed by the teacher but can develop the acquired knowledge. But in learning activities only some students are motivated to participate actively, so that when working on practice questions there are some students who experience difficulties. Therefore, it is important for teachers to apply the *MURDER* collaborative learning model according to their learning objectives so that learning activities can run effectively. The advantages of the *MURDER* collaborative learning model are that students become more active, practice accuracy, can express opinions and responses when answering questions from the teacher, students are more enthusiastic and motivated to take part in learning [17], [18]. Thus, the *MURDER* collaborative learning model can also help improve student learning outcomes.

Learning outcomes are abilities both cognitive, affective and psychomotor obtained by students after participating in the learning process. Learning outcomes as a form of behavior change that occurs in someone who receives learning, from a condition of not knowing and not understanding something, because he learns so that he produces knowledge and understands the things he learns [19]–[21]. Student learning outcomes are influenced by two main factors, namely internal factors and external factors. Internal factors come from within students consisting of physical aspects (health and disabilities), psychological aspects (intelligence, attention, interests, talents, motives, maturity, and readiness), and fatigue factors (spiritual fatigue and physical fatigue), while external factors External aspects come from family aspects, school aspects, and community aspects [22]–[24]. In addition, how well students receive lessons in the teaching and learning process and how well the teacher makes the atmosphere in the learning process interesting for students is also one of the determining factors in learning outcomes.

As for previous research that is relevant to the research I conducted regarding the application of the *MURDER* model and student learning outcomes, including research conducted by [25] the results show that there is an influence of the murder-type cooperative learning model on student activity and student graphic design learning outcomes (with a significance value of $\rho < 0.05$). Further research conducted by [26] the results show that the application of the *MURDER* type cooperative learning model can increase student achievement motivation and student achievement in class XI MIPA 6 senior high school 2 Amlapura in the 2018/2019 Academic Year in learning Civics. Research conducted by [27] shows the results that the application of the MURDER learning model can increase student learning activities and can improve student learning outcomes on the concept of motion systems. Further research conducted by [28] the results show that the application of the *MURDER* type cooperative learning model can improve student learning outcomes in the matter of the length of the two-circle common tangent in class VIII junior high school 6 Palu. Then the research conducted by [29] from the results of his research it can be concluded that the increase in the mathematical critical thinking skills of students who study with cooperative learning type *MURDER* is better than the increase in the mathematical critical thinking skills of students who learn with conventional learning, but both are still moderately qualified, and there is no difference in increasing mathematical critical thinking between students who study with cooperative learning type *MURDER* and students who learn with conventional learning based on the PAM category (high, medium and low). Research conducted by [30] the results showed that the MURDER learning model was not effective in mastering Chinese vocabulary for class X SMA Islam Athirah 1 Makassar. Research conducted by [31] shows the results that the MURDER learning model gives better results compared to expository learning. Research conducted by [32] stated that there was a significant increase in learning outcomes after the *MURDER* strategy was implemented. Then the research conducted by [33] the results show that students' spatial ability is in the very low category, student chemistry learning outcomes are in the moderate category, and there is a positive and significant relationship between spatial ability and student chemistry learning outcomes with a correlation coefficient of 0.391 and the relationship level is in the low category.

From some of the previous studies described above, it can be seen that the application of the MURDER learning model is only carried out in subjects other than chemistry lessons on reaction rate material, so there has been no research on the murder type collaborative learning model and its correlation with student learning outcomes at senior high school 4 Jambi City especially in terms of reaction rates. Therefore, it is important to do

research on the application of the MURDER type collaborative learning model and determine its correlation to student learning outcomes at senior high school 4 Jambi City on Reaction Rate Material.

The objectives of this study are: 1. To find out how the application of the MURDER type collaborative learning model in senior high school 4 Jambi City on the matter of reaction rates, 2. To find out whether there is a correlation between the MURDER type collaborative learning model on student learning outcomes at senior high school 4 City of Jambi on the material reaction rate. Based on the research objectives, the researcher is interested in conducting a research focus with the title "Analysis of the application and correlation of the murder type collaborative learning model on student learning outcomes at senior high school 4 Jambi City".

2.   RESEARCH METHOD

The type of research used in this research is descriptive correlational. The research design used is the Mix Method with the Concurrent Embedded type. The Mix Method design with the Concurrent Embedded type is characterized as a mixed methods strategy that applies one stage of collecting quantitative and qualitative data at a time, and in this design two data processes occur when a researcher compares one data source with another [34].

The population in this study were all students of class XI MIA SMAN 4 Jambi City in the 2015/2016 academic year consisting of 4 classes, namely XI MIA 3, 4, 5 and 6, totaling 159 students. The selection of the sample class uses the Purpose Sampling technique. Purposive sampling is a sampling technique based on certain considerations [35]–[37]. Based on this sampling technique, the sample class chosen was students taught in class XI MIA 3 with a total of 40 students.

Data collection techniques in this study for two types of data, namely data on the implementation of the learning model using the observation sheet instrument and data on student learning outcomes obtained through the posttest. Observation sheets are used to determine the attitudes and collaborative skills of students and teacher performance during the activity [38], [39]. The learning outcomes test consists of 20 items in the form of multiple choice, taken from 50 test items that have met the criteria of validity, reliability, discriminatory power, and level of difficulty. The learning outcomes test has an internal consistency of reliability coefficient = 0.73. From the analysis of the difficulty level of the test, it was found that 8 items were included in the easy category, 25 items were included in the moderate category, and 17 items were included in the difficult category. In addition, from the analysis of the item data, it was found that 22 items included poor discriminating power, 23 items with sufficient discriminating power, 4 items with good discriminating power and 1 item with very good discriminating power. While the observation sheet is prepared by providing a choice of answers that are made with certain criteria so that the filler chooses the answer that he considers most appropriate by placing a checklist on the selected answer, the answer criteria are made based on predetermined indicators. The treatment in the experimental class is adjusted to the syntax of the learning model to be used. With the Learning Implementation Plan (RPP) and Student Worksheets (LKS) developed based on Permendikbud No.65/2013 Process Standards for adjusting experimental class treatment of the learning model to be used.

The data analysis technique used is that before testing the hypothesis on the data that has been obtained, the research data must meet the analysis requirements which include the normality test of data distribution using the Liliefors test, homogeneity test using Fisher's test, linearity test. After these three tests are fulfilled, it is continued with the two average similarity test, the correlation test on the MURDER type collaborative learning model as the independent variable (X) with student learning outcomes as the dependent variable (Y). In accordance with the problems posed, the research hypothesis is formulated, namely that there is a significant relationship between the collaborative learning model of the MURDER type ($\mu 1$) on student learning outcomes ($\mu 2$) at SMA N 4 Jambi City on the subject matter of reaction rates.

3.   RESULTS AND DISCUSSION

Quantitative data and qualitative data from the value of implementing the MURDER collaborative model are presented in Figure 1 below:
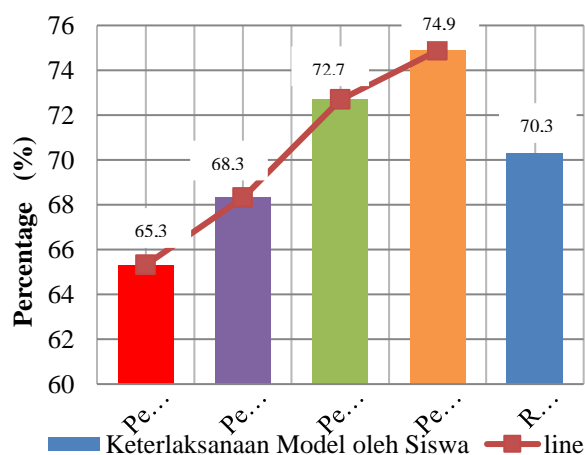
Figure 1. Percentage of Student Observation Sheet Score Diagram

Based on Figure 1 it can be seen that the average percentage for each meeting is 70.3%, so the score is categorized as good. The qualitative results from the student model performance observation sheet can be seen in Table 1 below:

Table 1. Qualitative Results of Student Model Performance Observation Sheets

No	Syntax	Observed Aspect	Final Conclusion on The Aspects Observed
1		Students pay attention to themselves in conditioning their respective moods for the learning process to take place.	In this initial step at each meeting, all students found consistency that was quite good, active and enthusiastic in creating an atmosphere to start learning.
2	Mood	Students answer apperception questions from the teacher.	The increase in students' ability to explore was shown by their enthusiasm at each meeting in responding to questions posed by the teacher and some of them showed progress in connecting with the previous material coverage.
3		Students explore further the range of subject matter with other sources.	There was an increase in the number of students at each meeting from quite capable to active in paying attention as well as exploring and some students began to take note of the range of material presented and other learning resources.
4	Understand	Students use the science concepts that have been learned through the hypotheses that have been made.	The development of each student in communicating and working together is getting better and better at each meeting so that students are able to contribute quite well in making group hypotheses.
5	Recall	Students prove the truth of the science concept through observation in the form of assignments or direct observation or practicum.	All students showed the ability to prepare tools and materials properly and correctly, understood work procedures after several meetings, but only a few students had problems in carrying out practicums.
6	Detect	Students identify the suitability of the science concept against their findings.	At this stage all students show good self-improvement in identifying their findings, then actively working together in their groups and some of them hold questions and answers. Even though students have difficulty adapting their findings to theory, slowly they can overcome them until the end of the meeting even though it is difficult.

No	Syntax	Observed Aspect	Final Conclusion on The Aspects Observed
7	Elaborate	Students display the results of discussions obtained through exploration, analysis, discussion, listening to opinions and testing hypotheses to further explore something.	Changes in behavior occurred in all students, where initially there was no question and answer process from groups that appeared or did not appear, there was a question and answer process even though there were still difficulties in its implementation, then not only that, students who did not appear slowly showed an increase in self-appreciation in pay attention to the group performing and listen to the results.
8	Review	Students make conclusions on the lessons that have been learned.	The existence of obstacles in conveying inappropriate conclusions in each group can slowly be overcome by most students who are always consistent at each meeting in making a sizeable contribution in making group conclusions and presenting the results of their discussions well.

From table 1 above it can be seen that there is a significant change in student behavior and this change occurs after the steps of the MURDER type collaborative learning model are implemented in the learning process. Data on the summary results of student evaluation tests in four meetings can be seen in Figure 2 below:
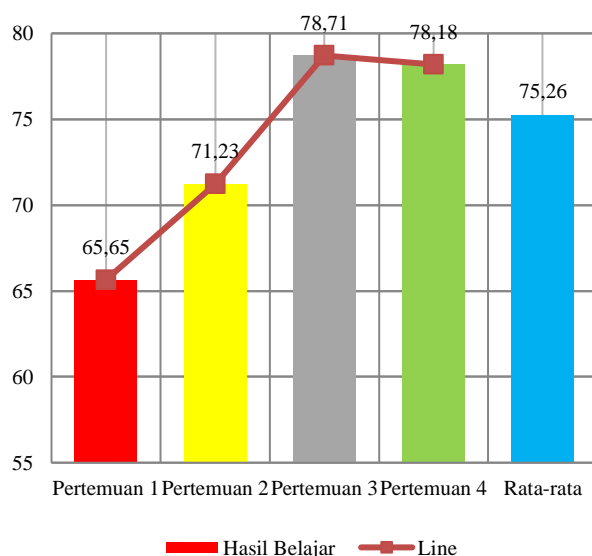

Figure 2. Percentage of Student Observation Sheet Score Diagram

From Figure 3.2 above it can be concluded that during the four meetings a significant increase in learning outcomes was obtained by 25.4% with an average score of 75.26 compared to the previous year, which was 60. Students will be successful in learning if they realize the implications of learning principles for themselves related to motivation and attention, activeness, direct involvement, repetition, challenge, and individual differences [40]. This is in accordance with the steps of the *MURDER* type collaborative learning model proposed by [41]–[43] where in the first aspect, mood is aimed at understanding student characteristics by paying attention to students' attention and learning motivation, in the second aspect, understand is intended to stimulate student activity at the beginning of learning so as to optimize student involvement, in the third aspect, repetition of recall is intended to increase student activity through repetition information during literature collection, in the fourth aspect, namely elaborate, which is intended to show differences in the abilities of students who are active during the learning process and in the last aspect, review, which is intended to provide feedback and reinforcement to students after the learning process ends so that students are more enthusiastic about learning. While the principle of challenge here is not too focused on one aspect but on several aspects aimed at directing students to find strong motives to overcome obstacles well.

Based on these learning principles, it can also be proven from the behavior of students who have been observed during the application of the steps of the *MURDER* type collaborative learning model, namely in the form of fairly good consistency in creating a learning atmosphere at the beginning of learning, active in

communicating, enthusiastic in exploring, working equally well in groups, being able to hold a question and answer process, increasing self-appreciation in paying attention to and listening to the results of groups that appear and being consistent at each meeting in making a sizable contribution in making conclusions. Therefore, the collaborative learning model of the *MURDER* type is important to apply to certain learning, because it can provide opportunities for students to actively participate in learning and be able to repeat and reconstruct information and ideas from a learning material, to be understood and used as their own which is then able to be communicated again. verbally and can collaborate well with others [44]–[46].

The correlation between the implementation of the *MURDER* type collaborative learning model and learning outcomes is sought using a simple correlation analysis, namely the product moment correlation test. Before being correlated, the data obtained from the observation sheet on the implementation of the *MURDER* type collaborative learning model and the learning achievement test, were first carried out a normality test, homogeneity test, linearity test, and two average similarity tests. In facilitating data analysis, researchers here use SPSS 22 software and the following results are obtained.

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Table 2. The results of the normality test, homogeneity test, linearity test, two average similarity test, and correlation test

Statistical Test	Normality test	Homogeneity Test	Linearity Test	Test for Equality of Two Means	Correlation Test
Analysis Results	Sig. (2-tailed); 1. Learning Outcomes: 0.155> 0.05 2. *MURDER* Model by Students: 0.2>0.05 *MURDER* Model by Master: 0.107>0.05	Sig. (2-tailed); Learning Outcomes and *MURDER* Models by Students: 0.121>0.05 *MURDER* Model by Teachers and Model Murder by Students: 0.322>0.05	Sig. (2-tailed); 0.386>0.05 and Fcount = 1.134 Ftable = 2.25 Fcount < Ftable	Sig. (2-tailed); Model Murder by Teachers and *MURDER* Model by Students: 0.058>0.05	Sig. (2-tailed); 0.000<0.05 and Pearson Correlation; 0.717**
Conclusion	So, the data is normally distributed	So, the data has the same or homogeneous variance.	There is a significant linear relationship between the implementation of the *MURDER* type of collaborative learning model (X) and learning outcomes (Y).	The two averages have the same average, so that the average value of student activity can represent the implementation of the *MURDER* type collaborative model.	The significance value is 0.000 <0.05 and the Pearson value has an asterisk meaning that there is a significant correlation between the implementation of the *MURDER* type of collaborative learning model (X) and learning outcomes (Y).

Based on table 2, it can be seen that the data analyzed has fulfilled all types of existing prerequisite tests so that the research data is considered to be able to go through a follow-up test, namely hypothesis testing with the aim of answering the research hypothesis formulation. After testing the hypothesis with the product moment correlation test, it is known in table 4.4 that the significance value is 0.000 <0.05, which means that there is a significant correlation between the two variables, both significant correlations of the *MURDER* type collaborative learning model (X) with learning outcomes (Y) or vice versa. Because the value of R = 0.717 is between 0.60 – 0.799. So it can be concluded that the relationship between the implementation of the *MURDER* type collaborative learning model (X) and learning outcomes (Y) is strong. The results obtained are in accordance with the research hypothesis that has been formulated previously, namely that there is a significant relationship between the *MURDER* type collaborative learning model (μ_1) on student learning outcomes (μ_2) at SMA N 4 Jambi City on the subject matter of reaction rate.

As for previous research that is relevant to the research I conducted regarding the application of the *MURDER* model and student learning outcomes, including research conducted by [47] showed the results that the application of the *MURDER* collaborative model had an effect on learning achievement and student activity in class X mathematics learning. Furthermore, research conducted by [48] The results showed that there was an influence between students who obtained the *MURDER* learning model and students who obtained conventional learning mathematical reflective thinking skills, there was an influence between students with high, medium, and low efficacy on mathematical reflective thinking skills, and there was no interaction between the *MURDER* model and the self-efficacy of mathematical reflective thinking skills. Further research conducted by [49] which shows the results that the average student learning independence is 72.64% with good enough criteria in the experimental class and control class 60.31% with good enough criteria and there is the influence of the *MURDER* learning model with B.F Skinner's behavior habituation theory on student learning independence. Then the research conducted by [50] The results show that there is a significant difference in the ability of mathematical connections between students who receive the CIRC *MURDER* strategy learning model and students who receive conventional learning. Then the research conducted by [51] states that there is a positive and significant relationship between learning motivation in chemistry subjects and students' chemistry learning outcomes. Further research conducted by [52] shows the results that the application of the guided inquiry learning model has a better effect than conventional learning models on student learning outcomes in the subject matter of hydrocarbons in class XI PMIPA senior high school 1 Woha in the 2019/2020 academic year. Then the research conducted by [53] shows the results that there is a positive correlation between the understanding of the concept of comparison with the results of studying stoichiometric chemistry material.

From some of the previous studies described above, it can be seen that the application of the MURDER learning model is only carried out in subjects other than chemistry lessons on reaction rate material, so there has been no research on the MURDER type collaborative learning model and its correlation with student learning outcomes at senior high school 4 Jambi City especially in terms of reaction rates. The novelty from previous research is to analyze the application of the MURDER type collaborative learning model and determine its correlation to student learning outcomes at senior high school 4 Jambi City in the matter of reaction rate.

The implication of the *MURDER* collaborative learning model can have short and long term impacts, as well as if the *MURDER* type of collaborative learning model is not implemented. The short-term impact of applying the *MURDER* type collaborative learning model is that students are able to improve their critical thinking skills, conscientious attitude, and confidence in expressing their opinions while the short-term impact of not implementing the *MURDER* type collaborative learning model is the lack of conditioning of students in class [54]–[56]. The long-term impact of applying the *MURDER* type collaborative learning model is that it can improve student learning outcomes while the long-term impact of not implementing the *MURDER* type collaborative learning model is that the learning process will become monotonous and students are not interested in paying attention to the lessons they are learning so that it can cause low student learning outcomes [57]–[59].

The limitations in this study are that it only analyzes and determines the correlation of the application of the MURDER learning model to student learning outcomes in the matter of reaction rate. So it is hoped that future researchers who wish to continue this research should apply the MURDER type collaborative learning model to other subjects in accordance with the learning objectives to be achieved so that the application of this learning model can run effectively and efficiently.

4.   CONCLUSION

Based on the results of the study it can be concluded that the MURDER type collaborative learning model can stimulate fairly good consistency in creating a learning atmosphere at the beginning of learning, active in communicating, enthusiastic in exploring, working well together in groups, holding a question and answer process, increasing appreciation in paying attention and listening to group results that appear and are consistent in each meeting has a sizable contribution in making conclusions, so this also affects the average learning outcomes of students who meet KKM standards. The application of the MURDER type of collaborative learning model (X)

contributes to Learning Outcomes (Y). For researchers who want to study more deeply about this type of MURDER collaborative learning model in science and other fields of science, it is advisable to use the results of this study as a comparison or consideration for improvement and refinement of research to be conducted in schools or other institutions.

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