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Improving Student Learning Outcomes at SMK Negeri 2 Kota Bengkulu Through Mastery Learning Model

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Abstract

This classroom action research aims to improve students' mathematics learning outcomes in class X Automotive Semester Even at SMK Negeri 2 Bengkulu City for the Academic Year 2023/2024 through the implementation of Mastery Learning. The subjects in this study were 18 students, consisting of 10 male students and 8 female students. This research was conducted in two cycles, with each cycle consisting of two meetings. Data collection techniques used were tests and observations. Based on the research results, the data of students' mathematics learning outcomes before the action (T0) were obtained at 44% with an average score of 66.3. In Cycle I (T1), it increased to 67% with an average score of 70.6 and further increased in Cycle II (T2) to 88.9% with an average score of 82. The research results indicate that by implementing the Mastery Learning teaching strategy, students' mathematics learning outcomes improved T2>T1>T0.

Introduction

Learning is an interaction between teachers and students, evident from the activities of students during the learning process. Learning activities conducted in schools are fundamental because the success of learning objectives depends on how the learning process is designed. According to Barlinger in Sofah (2005:1), learning is a process in which an organism changes its behavior as a result of experience. Learning is a process of individual change, namely behavioral changes resulting from interaction with the environment.

Behavioral changes due to learning will last long, and to some extent may not disappear, so experts usually formulate learning outcomes relatively and consistently. Learning is a mental activity that cannot be observed externally; what is happening within someone who is learning cannot be directly stated just by observing the person without them demonstrating the abilities acquired through learning.

Mastery learning is a learning strategy that adheres to the principle of learning mastery. Mastery Learning is an approach to learning based on the philosophical view that all learners can learn if they receive the right support conditions. The concept of mastery learning is a learning process aimed at mastering teaching materials thoroughly, meaning the way to master the material completely. This mastery learning is an individualized learning strategy using a group approach.

This strategy allows students to learn together based on the limitations of the subject matter that must be learned by the students. Learning to a certain level, providing sufficient study time, and providing assistance to students experiencing learning difficulties are also applied in this strategy.

Based on observations conducted in Class X Automotive Semester Genap SMK Negeri 2 Bengkulu City Academic Year 2023/2024, student learning activities in mathematics are still quite low. This is evident during the learning process, as some students do not pay attention to the teacher's explanations in front of the class, while some are also inactive in discussions. Additionally, the material provided by educators has not been able to make students understand the material taught.

Therefore, it is necessary to implement appropriate and more varied learning strategies so that students do not feel bored during material delivery. Without a clear strategy, the learning process will not be directed, making it difficult to achieve learning objectives optimally. One appropriate strategy to achieve all of these is by implementing mastery learning. According to Joice and Weil in Wena (2013:108), mastery learning presents an interesting and concise way to improve student performance to the level of achieving more satisfying subject matter.

From an educational standpoint, the teaching-learning method using mastery learning strategies is very beneficial for students because with this method, each student's ability can be developed to the fullest. This strategy consists of five stages, namely orientation, presentation, structured practice, guided practice, and independent practice.

Related research has been conducted by previous researchers, namely Armawan (2011) in "Mastery Learning as an Effort to Improve the Quality of Student Learning in Class XI-2 TKR Department at SMKN 1 Seyegan". Based on descriptive analysis results of data on the quality aspects of learning, the average price (mean) in cycle I was 2.616, in cycle II was 4.071, or there was an increase in percentage by 20.79% from cycle I to cycle II; standard deviation in cycle I was 1.4832, in Cycle II was 1.0180; variance in cycle I was 2.199962, in cycle II was 1.036281.

From the above research results, it can be concluded that by applying the mastery learning teaching strategy, student learning outcomes can be improved. The implementation of Mastery Learning can also increase the effectiveness of student activities in the learning process.

The aim of this research is to determine whether the Mastery Learning method can improve the Mathematics learning outcomes of class X OTOMOTIF students at SMKN 2 Bengkulu City in the academic year 2023/2024.

Methods

The research was conducted in the even semester of the academic year 2023/2024, from January 15th to March 15th, 2024, in the X Automotive class of SMK Negeri 2 Bengkulu City. The subjects of this study were all X Automotive class students in the even semester of SMK Negeri 2 Bengkulu City in the academic year 2023/2024, totaling 18 students, consisting of 10 male students and 8 female students. This research is a classroom action research aimed at improving and enhancing the learning process within the classroom. The research was conducted in two cycles, and the implementation procedure of this classroom action research consisted of 4 stages, namely action planning, action implementation, observation, and reflection. Data were collected using observation sheets and analyzed by comparing the observation data with the criteria set based on the descriptors seen on the observation sheets.

Tabel 1. Categories of Participation Assessment

Score	Category
81-100	Very active
61-80	Active
41-60	Active enough
21-40	Less Active
≤ 20	Not Active

Result

Students' Learning Outcomes Before Intervention (T0)

The data on students' learning outcomes before the intervention (T0) is derived from the average mathematics test scores, which amounted to 66.3, with a mastery level of 44%. The summary of students' learning outcomes data before intervention can be seen in Table 2.

Table 2. Recapitulation of Student Learning Outcomes Before Intervention (T0)

Category	Score	Number of students	Learning Mastery (%)	Average score
Very Good	91– 100	0	44% (mastering)	66,3
Good	81–90	0		
Good Enough	72–80	8		
Not Good	61–71	7	56% (not mastering)	
Least	≤ 60	3		
Total		18	100	

Student Learning Outcomes After Intervention (T1, T2)

Data on students' mathematics learning outcomes after intervention are obtained from student test results given at the end of each cycle. The data on students' learning outcomes consist of test data after intervention in Cycle I (T1) and Cycle II (T2). The recapitulation of data on students' mathematics learning outcomes in each cycle can be seen in Table 3 and Table 4.

Table 3. Recapitulation of Student Learning Outcomes After Cycle I Intervention (T1)

Cycle 1 (T_1)				
Category	**Score**	**Number of students**	**Learning Mastery (%)**	**Average score**
Very Good	91 - 100	0	67% (mastering)	70,6
Good	81 - 90	0		
Good Enough	72 - 80	12		
Not Good	61 - 71	5	33% (not mastering)	
Least	≤60	1		

Total	18	100	

Based on the table above, it can be seen that the mastery of student learning outcomes in the first cycle (T1) is 67%. There has been an improvement in learning outcomes compared to before the intervention. However, there are still weaknesses in the learning process. Students show a lack of enthusiasm in completing the given tasks by the teacher and are still hesitant to ask questions. They also find it difficult to understand the material. Therefore, the teacher made improvements by instructing students to seek additional information related to the material being discussed, either on the internet or in other mathematics books. Additionally, the teacher provided more motivation to the students and visited each group, allowing time for questions.

Tabel 4 Recapitulation of Student Learning Outcomes After Cycle II Action (T2)

Cycle 2 (T_2)				
Category	**Score**	**Number of students**	**Learning Mastery (%)**	**Average score**
Very Good	91 - 100	0	88,9% (mastering)	82
Good	81 - 90	4		
Good Enough	72 - 80	12		
Not Good	61 - 71	2	11,1% (not mastering)	
Least	≤60	0		
Total		18	100	

The completion of learning outcomes in Cycle II based on the data above is 88.9%, with an average learning outcome of 82. The completion of learning outcomes is higher compared to the students' learning outcomes before the intervention and the students' learning outcomes in Cycle I. This is because in Cycle II of the learning process, students have more learning resources, making it easier for them to understand and be motivated to complete the given tasks by the teacher.

Based on the data of students' learning outcomes before the intervention (T0), Cycle I, and Cycle II, there is an increase in the completion of learning outcomes and the average learning outcomes in mathematics. The completion of students' mathematics learning outcomes before the intervention (T0) was 44%, which increased to 67% in Cycle I (T1), and further increased to 88.9% in Cycle II (T2), which means it has reached the classical mastery criteria of ≥85%. Thus, the intervention was stopped in the second cycle. The average learning outcome of students before the intervention (T0) was 66.3 with a category of less satisfactory, in Cycle 1 (T1) the average score was 70.6, and in T2 the average score was 82. From T1 to T2, the students' scores significantly increased from 70.6 to 82 with a good category.

Observation Data of Student Engagement

During the learning activities in Cycle I and Cycle II, student engagement has shown improvement. The results of observing student engagement in Cycle I and Cycle II can be seen in Table 5.

Table 5. Summary of Student Learning Activity in English.

Group	Student Learning Activity **(%)**	
	Siklus I	**Siklus II**
I	73,08	78,85
II	75	75
III	80,76	78,85
IV	67,30	75
V	71,14	86,53
Average Student Learning Activity	73,46	78,85

The increase in student engagement from Cycle I, which was 73.46%, rose to 78.85% in Cycle II. Student engagement in Cycle I was lower compared to Cycle II, mainly because in Cycle I, students were not yet familiar with the Mastery Learning approach. Thus, during the learning process, such as group discussions, some students were preoccupied with their own activities, paying less attention to the teacher's explanations, and being less active in asking questions. In the second cycle, the teacher made improvements to enhance student engagement. While explaining, the teacher occasionally walked around and approached students who were not paying attention to their explanation.

Discussion

This research is a classroom action research conducted in 2 cycles consisting of 1 meeting each. Before Cycle 1 was conducted, the average student learning outcomes were 66.3 with a mastery rate of 44%. This was still far from achieving the classical mastery score of 85%. Therefore, in the learning process, mastery learning was applied to improve student learning outcomes. After implementing mastery learning, based on the research results obtained in Cycle I, the average student learning outcomes were 70.6 with a mastery percentage of 67%. In Cycle II, the implementation of mastery learning was understood by the students. Therefore, based on the research, the average student learning outcomes were 82 with a mastery percentage of 88.9%. It can also be seen from the students' activity during the learning process from Cycle I, which was 73.46%, increased to 78.85% in Cycle II.

The meeting in Cycle I discussed oxidation numbers and the development of the concept of oxidation-reduction reactions. In the initial activity, the teacher opened the lesson by greeting and checking the students' attendance. The teacher informed about the topics to be discussed and then motivated the students by asking questions and introducing mastery learning strategies to them. The students were asked to form groups based on their absentee numbers.

In the core activity, the teacher distributed handouts to the students and asked them to discuss the material. Then, one representative from each group was asked to explain the discussion results to the other group members. The teacher assisted in clarifying the explanations provided by the representatives of each group.

In the guided practice stage, students were less motivated to ask questions, so they had difficulty understanding the material. The improvement made by the teacher in the next meeting was to approach each group to provide an opportunity for questions. In the independent practice stage, students were less motivated and less enthusiastic in completing the given exercises because they were confused and did not understand the material obtained. Therefore, the teacher made improvements by assigning students to find information from other sources.

In the final activity, students drew conclusions about what they had learned. Here, students were not independent in drawing conclusions; they only wanted to draw conclusions when the teacher pointed them out first. The teacher's improvement was to encourage students to be more confident in drawing conclusions. The implementation of learning in Cycle I still had weaknesses, and the mastery achieved was not yet classical, so improvements were needed in Cycle II.

The implementation in Cycle II was carried out based on the weaknesses in Cycle I. In the orientation stage, students began to understand the learning steps applied, making it easier to achieve the expected learning objectives. In the presentation stage, students began to listen and pay attention to the teacher's explanations so that they could understand the material during the learning process. In the structured practice stage, the teacher reshuffled the initial groups with new groups, and students' activity in group discussions was seen when they collaborated to solve group problems given by the teacher. In the guided practice stage, students started to ask questions to the teacher about the material they did not understand, and some students even dared to solve their group problems in front of the class to present them. In the independent practice stage, students enthusiastically completed the exercises given by the teacher, resulting in better outcomes than previous activities. The implementation of learning in Cycle II, students' learning mastery had reached classical mastery, namely 85% of students had scores $\geq$ 72, so this research was stopped in Cycle II.

The learning outcomes obtained are caused by several factors, including teacher factors, instrument factors used, and also factors from the applied strategies. The classroom learning conditions applied in the first cycle, the learning process taught by the teacher resulted in less than maximum results, and the children were not very active; the weakness observed was the less conducive learning activities in groups, as students were still busy with their individual activities, so group learning activities appeared less active. This was different from the learning process in Cycle II, where the teaching by the teacher had started to improve, resulting in better conditions, and the children were very enthusiastic; group interactions ran very smoothly. Experienced teaching staff also greatly supported obtaining better learning outcomes.

Another weakness is in the item questions used; the quality of the questions is also seen from the level of thinking required to answer the questions. The questions are designed with the aim of determining students' mastery of the taught material, in other words, to determine the level of competence achieved by students. To achieve this goal, the questions must be in accordance with the basic competencies set.

The process of analyzing questions becomes very important to determine good and bad questions because good questions are needed to measure the actual condition of students, so a process of analyzing questions accurately and carefully is needed. So far, Bloom's taxonomy has been known to show levels of thinking in the cognitive domain. According to Bloom's taxonomy, there are six levels of cognitive domains: knowledge (C1), understanding (C2), application (C3), analysis (C4), synthesis (C5), and evaluation (C6). To be able to perform higher cognitive processes, mastering lower cognitive processes is not absolutely necessary. In mastery learning, students are required to truly master the material obtained comprehensively; this means that the levels of thinking in Bloom's taxonomy must apply in the implementation process.

However, in reality, after analyzing the questions used in tests to measure students' cognitive abilities, they only reached the application level (C3). Thus, the learning mastery achieved by students only reached the application stage. In the mastery learning process, all levels of cognitive domains should ideally be achieved so that the desired mastery learning is truly achieved.

Another weakness is also found in the observation sheet instrument; the observation sheet used is too general. Thus, in the observation conducted, it does not fully describe the mastery learning process. Observing students' learning activities will also affect students' learning outcomes because students' learning activities are a process in learning that can improve students' learning outcomes. That is why the observation sheet used must cover all activities applied in mastery learning, in other words, the preparation of the observation sheet used must lead to everything in the mastery learning process.

The application of the strategy used in this research refers to the implementation guidelines by Wena (2013); in the implementation process carried out, Wena stated that Mastery Learning is a learning model. But in reality, in the learning process carried out in the field, the implementation stages did not follow the stages of Mastery Learning in a structured manner. So from this research, it can be concluded that Mastery Learning is one of the learning strategies that can be used to improve students' mathematics learning outcomes.

Conclusion

It can be concluded that students' mathematical learning achievement increased by implementing Mastery Learning. The improvement observed is the increase in the percentage of student learning mastery from before the intervention (T0) by 44%, with an average learning outcome of 66.3. In Cycle I (T1), it increased to 67% with an average learning outcome of 70.6 and further increased in Cycle II (T2) to 88% with an average learning outcome of 82, indicating T2 > T1 > T0.

With Mastery Learning, teachers can also use it as an alternative if there are issues in other subjects. Therefore, the researcher suggests the following:

1. Teachers should utilize Mastery Learning strategies to make students more active in the learning process.
2. Mastery Learning strategies are recommended for their alignment with the allotted time and suitability for the core subject matter, leading to better student learning outcomes.
3. It is important for this research outcome to be beneficial as a balancing factor for theory and as a reform in the educational realm, particularly in the implementation of the teaching-learning process in the classroom using Mastery Learning strategies.

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