



EFFORTS TO IMPROVE THE RESULTS OF PHYSICS LEARNING WITH THE MIND MAPPING METHOD

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Abstract

This research used a classroom action research method using an adaptation research model from a combination of Sanford and Kemmis. The purpose of learning research using the mind mapping method can improve students' physics learning outcomes in the aspects of knowledge and skills. The research was conducted in two cycles. The first cycle was carried out twice as much research action. The research subjects were class X MM 01 as many as 36 students. Data collection techniques in this study used observation and tests. The data is in the form of learning outcomes in the form of assessments of skills and knowledge aspects using appropriate instruments. The test results in the first cycle based on the acquisition data percentage of classical learning completeness reached 63.89% with an average score of 66.67. The percentage of completeness is still below the classical minimum completeness standard. Skills assessment reached a percentage of 66.67% with an average skill score of 66.44. The test results in cycle II based on the acquisition data percentage of classical learning completeness reached 83.33% with an average value of 75.37. Skills assessment reached a percentage of 80.56% with an average skill score of 75.23. Based on the acquisition of the percentage value of learning outcomes from cycle I and cycle II an increase of 8.70% for the value of student knowledge and skills increased by 8.83% so that learning using the mind mapping method can improve student learning outcomes.

Keywords: Learning Outcomes, Physics Mind Mapping

INTRODUCTION

The 2013 curriculum requires students to have skills about living a life of faith, being productive, creative, innovative and contributing to their lives (Permendikbud RI number 36 of 2018). This curriculum changed the system during the pandemic. The implementation of the curriculum in special conditions has the objective of giving educational institutions the flexibility to implement the curriculum according to students' learning needs (Permendikbud RI number 719/P/2020). Based on this explanation, the curriculum applied in schools is trimming according to the needs of students.

Students and educators who interact in the learning environment are a learning process (Permendikbud RI number 719/P/2020). Learning physics requires aspects of knowledge, aspects of attitude and aspects of skills to go hand in hand. Students' creativity is prioritized and enhanced because physics learning aims to understand existing concepts and be able to solve problems using scientific methods. Learning objectives will be achieved if the learning methods used are appropriate and appropriate for students. The learning method is one of the strategies in learning in organizing the concepts given by the teacher. The method used in this research is a learning method with mind mapping. According to (Palil, 2018) and (Tony Buzan, 2008), mind mapping is a process of mapping thoughts about certain concepts by connecting the main concept with secondary concepts through means that are easy to understand. Learning with the mind mapping method allows students to pattern thoughts starting from the main concept and broken down into secondary concepts (Ibnu Badar Al-Tabany, 2017) and (Swardana, 2013). The mind mapping strategy is a strategy to make it easier for students to understand the concept according to their mind map (Eryanti, 2015). The right learning strategy will affect learning outcomes. According to Hamalik (2006), learning outcomes are the abilities that students have after receiving their learning experiences.

The results of preliminary observations on students regarding learning outcomes are still very low; this is with an assessment of the knowledge and skills. The percentage of student learning outcomes in terms of knowledge is 41.67%. In comparison, in terms of skills, it is 58.33%. The expected results are far from the minimum standard of completeness.

Students' poor learning outcomes encourage teachers to make efforts to improve the learning process by using the mind mapping learning method. The teacher provides appropriate teaching

materials to Edmodo; then, students are given the freedom to compile the material's mind mapping. In addition to observation through observation and discussion with fellow teachers, physics concepts will be easier for students to understand if students directly map existing physics concepts.

This research is also based on research conducted (Yunita et al., 2014) with the results of proving that the use of mind mapping can improve student understanding, which is shown in the increased interaction of the learning process in the classroom, the achievement of indicators for the success of learning outcomes tests, an increase in the learning outcome test scores. Between cycles. Another study was conducted by (Eryanti, 2015) with the results of the calculation of the hypothesis testing t -count = 2.11 at the significance level of 5% and $db = 76$ with t -table = 1.99, it can be stated that H_0 is rejected so that the final test results of the experimental group using strategy mind mapping is higher than conventional learning. The completeness of the experimental group's learning outcomes was 61.54%, while the control group was 33.33%. Other research as a reference was carried out by (Asril, 2018). The application of mind mapping learning strategies can improve learning outcomes by an average of 71.25 in cycle I and an average of 75.50 in cycle II. The quality of learning also increased from 54.16% in cycle I to 79.16% in cycle II.

METHOD

The qualitative descriptive method with Classroom Action Research (CAR) is used in this research. This research was conducted at SMK Negeri 1 Trenggalek with the address Jalan Brigjen Sutran No. 03 Trenggalek. As for the implementation in October - November 2020. The research subjects were students of class X MM 01, with a total of 36 students. Classroom action research includes planning, action implementation, observation, evaluation and reflection carried out in two cycles (Arikunto, 2019) and (Taniredja, 2010). The reflection results from the first cycle if it has not reached the completeness limit will be continued in the second cycle. Data collection techniques using observation, tests and documentation. There are two kinds of instruments used in this study, namely non-test instruments consisting of knowledge assessment guidelines, observation/observation guidelines, skills assessment guidelines, attitude assessment guidelines/attitude scales, and documentation and test instruments with written tests.

The mind mapping applied in this study is adopted from Arends (Trianto, 2009). The first

step identifies the main idea or principle covering several concepts. The second step identifies secondary ideas or concepts that support the main third step placing the idea. -the main idea in the middle or at the top of the map and the last step groups the secondary ideas around the main idea, which visually shows how these ideas relate to the main idea.

The data analysis technique used in this research is descriptive qualitative based on observations of the process and student learning outcomes. The results of the observation were analyzed by the percentage of which the results were compared between cycle I and cycle II with details: (1) the data on the results of knowledge, attitudes and skills were analyzed by looking for the average, then a comparison was made between cycle I and cycle II, (2) The fundamental analysis was outlined in narrative form. The data to be analyzed are in the form of learning completeness results with formulas;

$$P_1 = \frac{n}{N} \times 100\%$$

Explanation.

P_1 = percentage of students' learning completeness
 n = the number of students who complete the test score > 60 and a maximum score of 100

N = the number of all students (Eryanti, 2015)

The limitations of the learning completeness criteria are as follows:

- a. Individual completeness, if students reach a score > 60 from a maximum score of 100
- b. Classical completeness, if there are at least 75% of the students in the class who have achieved individual completeness.

RESULTS AND DISCUSSION

This study selected the subjects of class X MM 01 in the odd semester of the 2020/2021 school year, amounting to 36 students. Based on the data obtained by researchers on the previous material, it still shows the low value of student learning outcomes and students' activeness in physics lessons. This can be seen in the learning completeness of students in the previous chapter, about 50.00% in the realm of knowledge, 58.33% in the realm of skills. By using scoring in knowledge assessment, this percentage can be described the real conditions of students during the learning process. The material given by the teacher is used as pre-cycle material, namely business and energy materials. It appears in more than ten students who do not actively collect assignments on Edmodo and also do not provide

feedback while in class. Classically, the class cannot be active in learning. They tend to be silent and less active in communication, both face-to-face and online.

The stages in the first cycle include the planning stage and the action implementation stage. Exposure to these stages, among others, in the preliminary stage, the teacher provides a detailed explanation of optical material to Edmodo. The teacher provides instructions for the work and collection of assignments. Students hold discussions on Edmodo and WhatsApp groups about the subject matter available on Edmodo. Core activities of the teacher provide a brief explanation related to the preparation of mind mapping optical material. The teacher provides detailed directions regarding the assignment and asks students to conduct a literature study other than the teaching materials. Students do the work by recording the process to the mind mapping presentation. The teacher provides input or coordination regarding the work through the WhatsApp group or independent coordination of students.

The teacher reflects by providing input or comments on students' work that have been collected in the Edmodo task bag. At the end of the learning process, students are given the first formative test, which aims to increase students' success during the teaching process. In the first cycle, the learning outcomes of students had not yet achieved classical completeness. Completeness of learning reached 63.89% in the realm of knowledge and 66.67% in skills so that further cycle action is needed to achieve classical learning completeness.

The preliminary stage in cycle II, the teacher provides a detailed explanation of the material related to vibrations and waves to Edmodo. The teacher provides instructions for the work and collection of assignments. The process of directing assignments and material exposure is explained via video conference. Skills abilities during the activity were observed directly through video conferencing and assignments at Edmodo. After the presentation, a knowledge assessment was conducted through tests. The learning outcomes of students in cycle II achieved classical completeness. Completeness of learning reached 83.33% in the realm of knowledge and 80.56% in skills. This learning method could be used as a solution to improve student learning outcomes. The comparison of the results of each cycle is as follows.

Table 1. Knowledge and Skills Aspects for each Cycle

Description	Knowledge Aspect			Skills Aspect		
	Pre-cycle	Cycle I	Cycle II	Pre-cycle	Cycle I	Cycle II
Classical Completeness	50,00%	63,89%	83,33%	58,33%	66,67%	80,56%
Average Score	61,34	66,67	75,37	62,57	66,39	75,23

The researcher evaluates and reflects on the first cycle that has not reached the minimum completeness level. The students' activeness is still below 75%. It is necessary to improve the action in cycle II. Cycle II was implemented based on evaluation and reflection from cycle I by improving the teaching implementation plan and adjusted instruments. For example, when giving assignments via video conferencing, students can easily do mind mapping—skills assessment through the live presentation on video conferencing. Based on the acquisition of the percentage value of learning outcomes from cycle I and cycle II, there was an increase of 19.44% for the value of knowledge. In comparison, students' skills increased by 13.89%. According to research conducted by (Asril, 2018), the mind mapping method can improve student learning outcomes, besides that, it is also based on research (Alvionita Widayanti 1, I Nyoman Sudana Degeng 2, 2017), (Suryani, 2015), (Wahyudi, 2013), (Wiyarsih & Sutiman, 2009) (Yunita et al., 2014) mind mapping can have a significant effect on improving learning outcomes.

CONCLUSIONS AND SUGGESTIONS

Conclusion

This study concludes that the implementation of learning with the mind mapping method can improve students' learning outcomes in class X Multimedia 1 with classical learning completeness meeting the school's standards. Increasing students' learning outcomes in the knowledge aspect using the mind mapping method of class X Multimedia 1 students experienced a significant increase of 19.44%. Improved student learning outcomes in the skills aspect using the mind mapping method of class X Multimedia 1 students experienced an increase. This shows that students' ability to carry out learning activities online has increased responsibility and confidence during presentations so that the classical completeness value has been fulfilled.

Suggestion

From the research results, suggestions on learning the mind mapping method should be implemented in almost every physics material. However, the weakness that occurs in the field is the lack of adequate media for several students. During a pandemic, the learning process should be carried out through video conferencing activities

so that they can directly convey their work instructions. Teachers should be creative in directing students to think critically by utilizing digital learning resources, the environment and the natural environment to understand concepts in physics.

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