The Effect of Mind Mapping Media toward Physics Concepts Understanding

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Abstract
Science learning carried out by teachers mostly uses conventional methods and rarely uses media in the activities of their teaching and learning process. Media mind mapping in physics learning can be used to describe a lot of material and can package it to be more interesting. The aim of this research to determine the effect of mind mapping media toward the students' concept understanding. This study used quasi-experimental research with pretest and posttest control group design. The population used was all students of class X in SMA Negeri 1 Lingsar at 2018/2019 Academic Year. The number of samples are 32 students for the experiment class and 33 students for the control class taken by purposive sampling technique. Data analysis technique used is the t-test using IBM SPSS Statistics 22. Based on the results of hypothesis testing (t test), it is known that the significance value of the posttest data (0.00) is smaller than alpha testing (0.05), so it can be stated that the mind mapping learning method influences the students' understanding of concepts.

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INTRODUCTION

Education is one of the development goals that must be improved both in quality and quantity, this is very much needed in an effort to improve the renewal and improvement in education and to create quality human beings. The quality of education in Indonesia itself is still considered low. This can be seen from the number of school and college graduates who are still not ready to work in the community (Hermawan & Asep, 2016).

Mastery of physics material requires a students' concepts understanding. Concept understanding is the mastery of a material or concept of prerequisites to master the next material or concept (Haeruman, 2008). According to Berns & Erickson (2001) states in a domain of learning, understanding is an absolute prerequisite for improving high cognitive abilities, application, analysis, synthesis, and evaluation. Concepts can help a person classify, analyze, and connect fundamental structures for subjects in school. The concept is an idea or ideas that are generalized from human experience with several events and facts. According to Amien (1989) in Pujianto and Suyoso (2011) states the concept is an idea or ideas based on relevant experience that can be generalized to form a concept. Concepts can help a person classify, analyze, and connect fundamental structures for subjects in school.

Physics lessons are still considered difficult to learn among other natural science subjects. This is because students feel besides being required to understand existing concepts, they are also required to be able to use mathematical formulas to solve physics problems (Simanjuntak, 2013). One of the physics materials that is difficult for students to learn is Newton's Law, students also often feel bored and bored with teacher-centered learning. Teachers tend to use conventional models with lecture, question and answer, and assignment methods so that students can only

write and record what their teachers hear and explain, without being directly involved in the process of finding and developing knowledge according to their own abilities. So there are students who are responsive, easy to understand, some are slow to accept (Tambunan & Siregar, 2014).

Based on observations at SMA Negeri 1 Lingsar, science learning conducted by teachers mostly only uses lecture or conventional methods and rarely uses media in teaching and learning activities, this has an impact on students' concept understanding which is still relatively low. One learning method that can be used is mind mapping. According to Buzan (2012) mind mapping is a creative and effective note-taking technique, which will literally map the mind. Mind mapping is a recording technique that uses words, colors, lines, symbols and images by combining and developing the potential of the brain's work which makes it easy for someone to organize and remember all forms of information. Besides this method is also soothing, fun, and creative to overcome the various problems that will arise in learning, teachers must find alternative solutions to be more extensive in guiding students. This is what then underlies the emergence of new innovations.

Mind mapping is called a "Swiss knife" for the brain, and for children it is a wonderfully amazing tool that can give them the opportunity to open up and explore memory spaces and understanding, creative thinking, analysis, preparation for schoolwork, review and self-expression (Buzan, 2005). This study aims to determine the effect of mind mapping media toward student's concepts understanding.

METHOD

This research was conducted at SMA Negeri 1 Lingsar in October 2018 to January 2019. This study was a Quasi Experimental research, a design that has a control variable but is not fully used to control external variables that affect the implementation of the experiment. This research is a type of quantitative research (Sugiyono, 2012). The research focuses on two variables namely the mind mapping learning model as an independent variable and students' concepts understanding as the dependent variable.

The sample in this study were students of class X MIA1 of SMA Negeri 1 Lingsar in the 2018/2019 academic year. The instrument in this study is a written test in the form of questions which are developed based on indicators of understanding concepts in the subjects of Physics Newton's Law subject. To test the statistical hypothesis in this study a t-test was conducted between the experimental class after learning using mind mapping media and after conventional learning in the control class.

RESULTS AND DISCUSSION

The description of the pretest and posttest results of the experimental class and the control class in this study is presented in Table 1.

Table 1. Description of research results

Items	N	Minimum	Maximum	Mean	Std. Deviation
Pretest_Experiment	32	25.00	50.00	37.34	7.43
Postest_Experiment	32	60.00	100.0	81.93	9.57
Pretest_Control	32	22.50	50.00	34.01	5.76
Postest_Control	32	52.50	85.00	73.40	7.28
Valid N (listwise)	32				

The results of the analysis of the pretest and posttest mean of the experiment and control classes are presented in Table 2.

Table 2. The mean pretest and posttest scores

Score	Experiment	Control
Pretest	37,34	34,22
Posttest	81,93	73,40

Calculation of sample homogeneity test is done using the levene test while the normality test uses the Kolmogorov-smirnov test. Homogeneous and normal data if the Sig. (significance) Based on Mean > alpha testing (0.05). Based on the results of the analysis that has been done it can be stated that the variant of the data is homogeneous, because the value of Sig. (0.856)> of alpha testing (0.05), so it can be stated that both samples have uniform or homogeneous variants. Student learning outcomes data both the experimental class and the control class based on the results of the normality test showed that a significant value> 0.05 so it can be stated that the data is normally distributed.

Based on the results of hypothesis testing (t test), it is known that the significance value of the posttest data (0.00) is smaller than alpha testing (0.05), so it can be stated that the mind mapping learning method influences the students' concepts understanding. Based on the analysis of student learning outcomes through preliminary tests in the experimental class and the control class before being given treatment can be known from the average value of the concept understanding of the two sample classes, for the experimental class has an average value of 37.34 while the average value in students control class of 34.22. The results of the final test (posttest) after being given treatment for the experimental class taught using media mind mapping have an average value of concept understanding of 81.93 and the control class taught by the lecture method has an average value of 73.40, from the results Hypothesis testing conducted shows that there are differences in understanding of concepts between the experimental and control classes. Learning with mind mapping learning media has an average value that is higher than conventional methods. It can be concluded that there is an influence of the use of mind mapping media toward the understanding of students' physics concepts in class X SMA Negeri 1 Lingsar Academic Year 2018/2019.

The results of this study are in line with the findings of Rahayu (2014) that mind mapping media can improve memory by filling out images, making graphics and analyzing charts. Implementation of learning with mind mapping media is to explain all the images on mind mapping media to students by mentioning or giving the characteristics of the picture being explained. The use of mind mapping media can help students to remember the information they get. In addition, this mind mapping media also provides a more real picture because students not only listen and imagine objects, but also see them so students can better understand the information.

CONCLUSION

Based on the results of research and data analysis, it can be concluded that there is an influence of the use of mind mapping learning media toward students' concepts understanding evaluated from the results of the posttest in the experiment class and the control class, where in the experiment class the average score of posttest was 81.93 while in the control class the average score of posttest was 73.40.

SUGGESTION

Research on the use of mind mapping learning media can be done on different samples and subject matter besides Newton's Law.

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