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Increasing Students' Creativity and Learning Outcomes on Substance Pressure Materials with The Mind Mapping Learning Method

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Abstract: Science is one of the subjects that is still considered difficult for students to understand so students' mastery of concepts in the learning process is still lacking which causes low creativity and student learning outcomes. This study aims to determine the increase in creativity and learning outcomes of students on substance pressure material with the Mind Mapping learning method. This type of research is quantitative and descriptive using the Pre-Experimental method (One Group Pretest-Posttest Design). This research was conducted at MTsN 6 Kuta Baro East Aceh class VIII-3 with a sample of 20 students, sampling using the purposive sampling technique. The instruments used are observation sheets and test questions. The data analysis technique used is the N-gain test for learning outcomes and the percentage for creativity. The results showed that there was an increase in students' creativity and learning outcomes on the material pressure of substances using the Mind Mapping learning method. The increase in creativity of class VIII-3 students in making Mind Maps is included in the category of very good criteria, from 10% to 50%. The improvement of student learning outcomes in class VIII-3 based on the N-gain test is in the medium category, namely 0.7; 0.45; and 0.3.

Keywords: Creativity; Learning Outcomes; Mind Mapping

Introduction

The current demand for learning is to prepare and facilitate students to have 21st-century skills. This is following Siswanto's opinion which states that "students can develop and master skills according to the development of science and technology, and compete globally. The 21st-century skills are critical thinking skills, problem-solving, communication, collaboration, and creativity" (Siswanto, 2018). At this time, individuals must prepare themselves as humans who have a number of skills, including being able to work together with others, having high thinking skills, being creative, skilled and able to communicate effectively, and being able to become lifelong learners (Wahyuni, et al., 2021).

Creativity plays a very important role so that students are better prepared to face the development of science and technology. However, the facts that occur in the field show that so far informal educational institutions it appears that attention to creativity in the teaching and learning process, especially in science subjects is still lacking, the learning process that is emphasized is more on memorizing concepts. This is supported by Afriyanto and Pusporini (2017) opinion stating that "mastery of the concept of students in the learning process is still very lacking which causes low creativity and student learning outcomes (Afriyanto, 2017). Mastery of concepts obtained by students can foster student creativity in solving a problem (Suranti, et al., 2017).

Today, a conducive learning atmosphere is still very concerning in science learning in schools. This is following Afriyanto's opinion which states that "Science is one of the subjects that is still considered difficult for students to understand so that students' learning

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motivation in participating in learning is still very lacking, this causes student learning outcomes to have not reached the Minimum Completeness Criteria. The main key to obtaining measures and data on student learning outcomes must be to know the outline of indicators (indications of certain achievements) associated with the type of achievement to be expressed or measured (Lasmanah, 2016).

The results of the interview that the author conducted on March 10, 2021 online with a science subject teacher at MTsN 6 Kuta Baro, East Aceh, obtained information that when the science learning process took place some students were active, but their activity was still in the moderate category, such as asking things that are not understood or poorly understood, carrying out tasks not properly and correctly, and others.

Students are still not creative in developing their learning potential, this is also because students still make the teacher one of the main sources of knowledge, without any awareness in each of them to learn independently when the teacher is absent. The material taught by the teacher is still difficult for students to understand, one of which is the material pressure of substances, the material is very difficult for students to understand because the learning process is not included in making experiments. However, they only explain on the blackboard, and at the end of the learning process students are given assignments to work on and collect at the next meeting.

Then, the results of the interview also obtained information that so far no one has conducted research using the Mind Mapping method on various aspects of the school. Therefore, this research is First Research or the latest research at the school, to make students better in the learning process, so that students can get better learning outcomes.

The results of observations have also been carried out during practice teaching at the school in class VIII, when teachers teach there is still a lack of variety of models or methods applied in the learning process. The learning process uses the lecture method, which still focuses on the blackboard and rarely does experiments, thus allowing students to quickly feel bored, fall asleep, and when explaining too much, many students in the class don't listen anymore and are even busy with their respective activities. such as talking to fellow friends, making noise, and so on.

So, to see the creativity of students in terms of how to develop new ideas, create a project and create something new is still lacking. This is supported by the low learning outcomes of students at MTsN 6 Kuta Baro, East Aceh, some students have passed the Minimum Completeness Criteria, which is 68, but there are still many students who do not pass the Minimum Completeness Criteria.

Efforts that can be made to increase students' creativity and learning outcomes on substance pressure material are using the Mind Mapping method. Mind Mapping is a method that can be used as a method to remember a lot of information by utilizing the right brain (long-term memory) with notes. The notes are made by forming a pattern of interrelated concepts, where the main topic is placed in the middle, while the sub-topics and their explanations are connected with branches (Nugraha et al., 2020).

The use of Mind Mapping in learning can provide several benefits including increasing student creativity, increasing student learning outcomes, and as an instrument for assessing student learning outcomes. Mind Mapping or concept maps is a visual technique that aligns the learning process by remembering and working the brain naturally. Alignment of the learning process with the way the brain works naturally because at the time of making Mind Mapping it combines writing, writing sequences, relationships between words and colors, images, and dimensions or space (Nugraha, et al., 2020).

Several studies regarding the Mind Mapping method have been carried out by (Acesta, 2020; Nugraha, et al., 2020; Ristiyani, 2019). The results of the research study revealed that the students' Mind Mapping abilities were included in the good category. Students can make Mind Maps well in terms of depth of material and keywords. The format in making Mind Maps that are often ignored by students is in the categories of images, colors, and branches Nugraha, et al). The results of Ristiyani's (2019) research study revealed that there was an effect of the application of the Mind Mapping method on the learning outcomes of class VIII at SMP N 6 Purwokerto. Learning outcomes are higher using the Mind Mapping method than using the lecture method. The average value of the experimental class is higher than the control class.

The results of Nuha's research study revealed in its conclusion that there is an influence on the Mind Mapping method as the application of students' creativity to learning outcomes, students' creativity in making Mind Mapping products is included in the creative category, this is followed by the completeness of participants' learning outcomes good education (Nuha, 2020). The results of the Acesta (2020) research study revealed in its conclusion that the Mind Mapping method affected students' creative thinking skills, students were more able to develop ideas and ideas to solve problems using Mind Mapping.

Method

This type of research is descriptive quantitative. By using the pre-experimental method (One Group Pretest-

Posttest Design). The form of the research design is as follows (Febry, 2019).

Table 1. Research Design *One Group Pretest-Posttest*

Class	Pretest	Treatment	Posttest
Experiment	T_1	X	T_2

with:
T1 : Pretest
T2 : Posttest
X : The treatment given to the experimental group using the Mind Mapping method.

This research was conducted at MTsN 6 Kuta Baro, East Aceh, which is located on Idi Rayeuk Keude Geurobak Buket Teukuh Street, Idi Tunong District, East Aceh Regency. The time of the research was held in the Odd Semester on August 23-26, the Academic Year 2021/2022. The population in this study were all students of class VIII MTsN 6 Kuta Baro East Aceh, totaling 99 students. Sampling in this study uses the purposive sampling technique. The purposive sampling technique is a sampling technique for data sources with certain considerations (Sugiyono, 2017). The sample in this study was class VIII/3 Odd Semester 2021-2022, totaling 20 students. With the consideration that in class VIII-3 there are abilities of students who are evenly distributed from high, medium, and low and are considered the most understanding about what we expect in the learning process.

The instrument for collecting student creativity data is an observation sheet by observing projects made by students in the form of Mind Mapping using six indicators, namely fluency thinking skills, flexible thinking skills, original thinking skills, and detailed thinking skills. the ability to detail (elaboration), the ability to assess (evaluation), and feel challenged (Mahfud, 2017). Furthermore, the instrument for collecting data on student learning outcomes is by using multiple-choice questions (multiple choice), pretest (pretest), and final test (posttest) by giving an objective test consisting of several questions. The criteria for assessing the creativity of students used can be seen in the Table 2.

Table 2. Criteria for Evaluating Student Creativity

Criteria	Value
Very Good	81 – 100%
Good	61 – 80%
Enough	41 – 60%
Less	21 – 40%
Very Less	0 – 20%

Result and Discussion

Student Creativity

The data on the results of the creativity assessment through the making of Mind Mapping by class VIII-3 students for 3 meetings can be seen in Table 3 below:

Table 3. Data on the Creativity Value of Class VIII-3 Students Through Mind Mapping

Student Name	Value		
	Meeting I (%)	Meeting II (%)	Meeting III (%)
AK	50.00	56.20	62.50
AR	65.60	68.70	71.80
AS	53.10	56.20	62.50
AA	71.80	81.20	84.30
AF	62.50	81.20	84.30
FU	81.20	84.30	87.50
HF	65.60	78.10	81.20
HH	65.60	81.20	84.30
MB	50.00	78.10	81.20
MW	59.30	81.20	84.30
MR	50.00	53.10	62.50
MN	53.10	56.20	65.60
MW	68.70	71.80	75.00
MN	59.30	78.10	81.20
MA	50.00	59.30	62.50
MT	59.30	65.60	71.80
MHF	53.10	56.20	59.30
NA	59.30	65.60	78.10
NMF	59.30	81.20	87.50
SM	81.20	84.30	87.50

Based on Table 1, it is explained that there is an increase in the creativity value of class VIII-3 students through making Mind Maps from meeting I to meeting III. Then, the value is adjusted according to the creativity criteria assessment, here is the full description.

Table 4. Percentage of Students' Creativity Scores for Class VIII-3 According to the Assessment of Creativity Criteria

Criteria	Student Quality					
	Meeting I	%	Meeting II	%	Meeting III	%
Very Good	2	10	7	35	10	50
Good	6	30	7	35	9	45
Enough	12	60	6	30	1	5
Less	0	0	0	0	0	0
Very less	0	0	0	0	0	0
Total	20	100	20	100	20	100

Based on Table 4, explains that there is an increase in the creativity value of class VIII-3 students through making Mind Maps from meeting I to meeting III. Then, the value is adjusted to the creativity criteria assessment, namely very good, good, sufficient, less, and very less. Based on Table 4, it was found that the creativity value

of class VIII-3 students at the first meeting of the very good criteria category was 10%, the criteria category was good 30%, and the criteria category was 60% enough.

Furthermore, the second meeting for the very good criteria category is 35%, the criteria category is good 35%, and the criteria category is quite 30%. And at the third meeting, it was found that the criteria category was very good 50%, the criteria category was good 45%, and the criteria category was quite 5%. The following is a graph of the increase in creativity of class VIII-3 students from meetings I, II, and III.

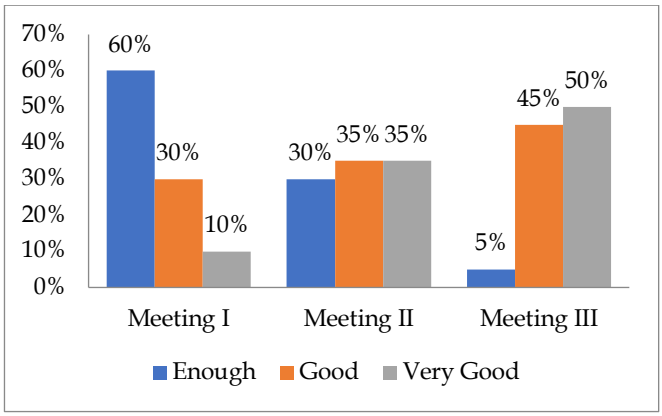

Figure 1. Graph of Increasing Student Creativity for Class VIII-3

Based on the results of the creativity research above, the use of the Mind Mapping learning method in classes VIII-3 can increase the creativity of students. This is following the results of research Nuha (2020) revealed in her conclusion that "There is an increase in the Mind Mapping method as the application of student creativity to learning outcomes, student creativity in making Mind Mapping products is included in the creative category, this is followed by with good student learning outcomes". The Mind Mapping learning method is one of the creative ways and the best solution for students in compiling a variety of information so that it is easy to understand, and the Mind Mapping Method is one of the methods used to overcome the condition of students who are less active and creative in their involvement in learning activities (Efi, et al., 2017). Therefore, the creativity of students can be seen through the results of Mind Mapping through the use of curved lines, colors, and images, from the first meeting to the third meeting.

This is supported by the acquisition of an increase in the creativity value of class VIII-3 students, the very good criteria category at the first meeting is 10%, the second meeting is 35%, and the third meeting is 50%. The success of increasing the creativity of class VIII-3 students is supported based on the results of the study Acesta revealed in his conclusion that "The Mind Mapping method affects the creativity of students, students are more able to develop ideas and ideas to solve problems using Mind Mapping, this is followed by the completeness of good student learning outcomes" (Acesta, 2020). The implementation of learning using the Mind Mapping method can improve students' creative thinking skills, because the Mind Mapping method is more fun. Students become more active in the learning process and are able to increase knowledge and generate ideas in solving problems that arise in the learning process (Ananda, 2019).

Student Learning Outcomes

Data on the percentage of the results of the Pretest and Posttest scores obtained by students, to see the average, highest and lowest can be seen in Table 3 below:

Table 3. Percentage of Pretest and Posttest Results

Data	Percentage of Pretest Results	Percentage of Posttest Results
Total students	20	20
The highest value	30%	35%
The lowest value	25%	30%
Average	45%	70%

Improved learning outcomes can be obtained by using the N-gain formula, which is obtained based on the average value of the Pretest and the average value of the Posttest of class VIII-3 students. The results of the calculation of the average value of the Pretest is 45% and the average value of the Posttest is 70% with a sample of 20 students. Then the N-gain score obtained is 0.45.

Based on data analysis on improving student learning outcomes in class VIII-3 using N-gain, if the resulting score is > 0.7 then the increase is included in the high category, but if the resulting score is 0.3 to 0.7 the increase is included in the moderate category, and if < 0.3 is included in the low category. Based on the information above, the increase in class VIII-3 student learning outcomes according to the data from the Pretest and Posttest results is included in the moderate category, namely with a score of 0.45.

At the beginning of the lesson, students in class VIII-3 were given pretest questions, the lowest score for the pretest was 25%, the highest score was 30% and the average score for the pretest was 45%. This happens because at the beginning of learning students have not been given treatment in the form of learning methods. After applying the learning method, the students were then given Posttest questions. The results of the Posttest showed that the highest score was 35%, the lowest score was 30%, and the average score was 70%. This is because after being given treatment with the learning method, namely the Mind Mapping method, class VIII-3 students make it easier to remember the material learned through the Mind Mapping that they made. The following is a graph of improving student learning outcomes for classes VIII-3.

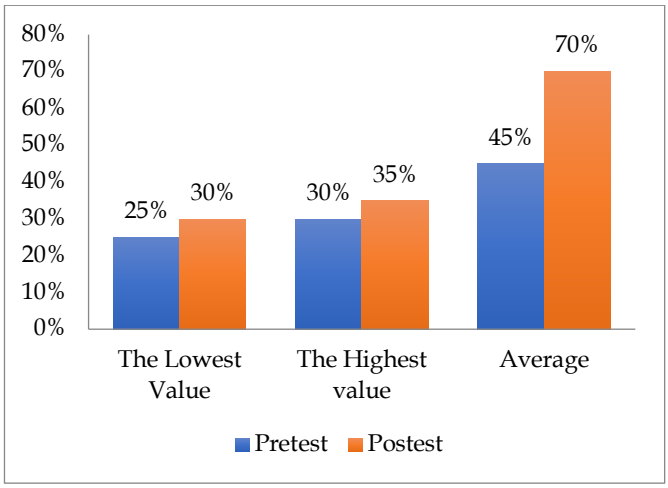

Figure 2. Graph of Improving Student Learning Outcomes for Class VIII-3

Based on the research results obtained above, the Mind Mapping method can improve student learning outcomes for classes VIII-3, because the Mind Mapping method is one method that can help students remember, and make it easier for students to understand learning material. Mind Mapping can also make it easy for students to remember a lot of information, by utilizing the right brain (long-term memory) through the notes it makes (Prasetya, 2020).

This is supported by the acquisition of the average pretest score of class VIII-3 students before being given treatment is 45%, and the average post-test score after being given treatment in the form of the Mind Mapping method is 70%. The improvement of student learning outcomes in class VIII-3 based on the N-gain test is in the medium category, namely 0.7; 0.45; and 0.3. This is following the results of research by Kustian (2021) who states in his conclusion that Implementation of science learning through Mind mapping learning can improve the learning outcomes student. Where the test results of students before using Mind Mapping were an average of 48.10 with student learning completeness of 20.69%. After applying Mind Mapping learning, it increased to 69.21 with 53.12% of students' learning mastery. Aziza, et al in their research also found that the application of the mind mapping learning model carried out in class IV SDN Karangsono could improve student learning outcomes. Student learning outcomes in the first cycle showed an increase from the initial conditions with an average value of quite good (Azizah, et al., 2018).

Conclusion

Based on the results of the research and discussion carried out, it can be concluded that there is an increase in creativity and learning outcomes for class VIII-3 students with the Mind Mapping learning method on substance pressure material at MTsN 6 Kuta Baro, East Aceh. Increasing the creativity of class VIII-3 students in making Mind Maps is included in the category of very good criteria, from 20% to 50%. The improvement of student learning outcomes in class VIII-3 based on the N-gain test is in the medium category, namely 0.7; 0.45; and 0.3.

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