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The Effect of Mind Mapping Model on The Students of Biology Learning Outcomes of SMAN 12 Maros

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Abstract

The problems found in SMA Negeri 12 Maros are that students still pay less attention to the teacher when explaining and make students passive. The reason is the lack of awareness of aspects of the learning process in the classroom and the lack of variety of learning models applied by teachers to impact student achievement and learning outcomes. This research is an experimental study that aims to determine the differences in the learning outcomes of class XI students of SMA Negeri 12 Maros who are taught using the Mind Mapping learning model and the conventional model on the Excretion System Principal Material. The sample in this study were students of class XI MIA 1 and class XI MIA 2 SMA Negeri 12 Maros. The experimental class was taught using a mind mapping model, while the control class was taught using a conventional model. Based on the results of data analysis obtained a sig value of 0.001 <0.05, it can be concluded that there is an influence on student learning outcomes using the mind mapping learning model in class XI SMA Negeri 12 Maros.

Keywords: Mind Mapping, Learning Outcome

A. Introduction

The mind mapping model is a model that focuses on optimizing the work of the brain, where the left and right hemispheres of the brain are used simultaneously so that the formation of knowledge works comprehensively and meaningfully. According to Nurhidayah (2018), selecting appropriate and efficient learning models is one way to realize the success of teaching and learning activities so that students can accept and understand the subject matter. Varied learning models in teaching and learning activities are essential so that students are not bored and bored.

The problems found at SMAN 12 Maros are that students pay less attention to the teacher when explaining, so that students become passive and less enthusiastic in receiving lessons. The reason is the lack of awareness of aspects of the classroom's learning process and the lack of variety of learning models carried out by teachers. According to Muzdalifa (2018), the mind mapping model can be an alternative model that can be used in learning activities which, of course, have the intention that the learning objectives that have been set can be achieved.
Based on this, the researchers conducted a study to determine the effect of the mind mapping learning model on the concept of the excretory system material on the learning outcomes of class XI students at SMA Negeri 12 Maros.

B. Literature Review

1. Learning Outcome

Kismawati (2018) states that the learning outcome is a change in overall behaviour, not just one aspect of potential abilities, but includes students' cognitive, affective and psychomotor skills. Learning outcomes by education experts cannot be seen separately and must be comprehensive.

According to Rusman (2014), several factors influence student learning outcomes, including (1) Internal factors, namely the physical and spiritual condition of students, (2) External factors, namely environmental conditions around students, such as environmental factors. (3) The learning approach factor, namely the type of student learning effort, includes the strategies and methods used to carry out activities to study learning materials. Zakky (2018) argues that other definitions of learning outcomes can also be interpreted as something that students achieve thanks to the effort expressed in knowledge, assignments and basic skills contained in various aspects of life. Learning outcomes are the main goals to be achieved in learning activities. Students' understanding can be seen in the learning outcomes obtained. So, learning outcomes are learning achievements achieved by students in learning activities by bringing a change and forming one's behaviour.

2. Mind Mapping Learning Model

According to Marxy (2017: 175), mind mapping is a practical, creative way of taking notes and will literally map thoughts. So a long list of information can be turned into an organized, easy-to-remember map that aligns with the natural workings of the brain. "Mind mapping is a model that focuses on optimizing the work of the brain, where the left and right hemispheres of the brain are used simultaneously so that the formation of knowledge works as a whole, and is meaningful" (Anindita et al., 2018: 120)

C. Methodology

1. Research Design

The design used in this study is the Non-equivalent Control Group Design, which selects the sample not randomly but with a specific purpose, namely to see the equivalence between the control class and the experimental class.

The population in this study were all students of class XI SMA Negeri 12 Maros for the academic year 2019/2020.

Table 1. Total Research Population

Kelas	Jumlah Siswa
XI MIA 1	32
XI MIA 2	35
XI IIS 1	30
XI IIS 2	34
Total	131

The sampling method was carried out using a non-probability sampling technique, namely purposive sampling. Sugiyono (2018: 124) states that purposive sampling is a technique with specific considerations.

Using this sampling technique, the researcher has determined the sample from the study, namely class XI MIA 1, which consists of 32 students as the experimental class and class XI MIA 2, which consists of 35 students as the control class. This was determined because class XI MIA 1 and class XI MIA 2 had met specific requirements from the researcher to become the research object.

2. Instruments

The instrument in this study used a written test in 30 numbered multiple-choice questions. Instruments are given before and after applying the mind mapping learning model.

3. Technique of Data Analysis

The data analysis technique in this study used descriptive statistics and inferential statistics. The descriptive analysis includes the highest value, lowest value, average, and standard deviation. Student learning outcomes data were analyzed using the following formula:

$$\text{Score} = \frac{\text{Number of Correct Answers}}{\text{Number of Questions}} \text{ X } 100$$

While inferential analysis uses normality, homogeneity and hypothesis testing, each using SPSS version 18. Hypothesis testing uses a two-part test with a level of = 0.05. Hypothesis testing of student learning outcomes test data were analyzed using a t-test on an independent sample (Independent sample t-test).

D. Findings and Discussion

1. Findings

Descriptive Statistical Analysis

Table 1. Descriptive Statistical Values in the Experimental and Control Class *Pretest*

	Eksperiment Class	Control Class
N	32	35
Range	46	43
Minimum	27	30
Maksimum	73	73
Mean	48.13	50.80
Std. Deviasi	13.063	10.813

Based on table 1, it can be seen that the pretest score in the experimental class was the highest score of 73, the lowest score was 27, the average score was 48.13 with a standard deviation of 13.063. While the control class with the highest score was 73, the lowest score was 30; the average score was 50.80 with a standard deviation of 10,813.

Table 2. Descriptive Statistical Value in the Experimental and Control Class Posttest

	Eksperiment Class	**Control Class**
N	32	35
Range	36	57
Minimum	57	33
Maksimum	93	90
Mean	72.50	59.60
Std. Deviasi	10.349	14.973

Based on table 2, it can be seen that the posttest score in the experimental class was the highest score of 93, the lowest score was 57, the average score was 72.50 with a standard deviation of 10.349. In the control class, the highest score was 90; the lowest score was 33, the average score was 59.60 with a standard deviation of 14,973.

Inferential Statistics Test

a. Normality Test

Normality test results can be seen in Table 3

Table 3 Normality test result

	Class	Kolmogorov-Smirnov
Leraning Outcome	*Pretest* Eksperiment	0.594
	Pretest Control	0.726
	Posttest Eksperiment	0.844
	Posttest Kontrol	0.620

Based on table 3 , the significance value obtained from the results of the normality analysis of the data is more than 0.05 by using the Kolmogorov-Smirnov test formula. Because the value of *sig* > 0.05, it can be concluded that the research data is normally distributed.

b. Homogenity test

Homogeneity test results can be seen in Table 4

Table 4 Homogenitas test result

	Based on Mean	*Sig.*
Learning Outcome		0,054

According to the table four known values *(Sig) Based on Mean* is equal to 0.054> 0.05, it can be concluded that the variant of data *posttest* experimental and *posttest* control are the same or homogeneous.

c. Hypothesis test

Hypothesis Test Results can be seen in Table 5

Table 5 Hypothesis Test Results

	Sig. (2-tailed)
Learning Outcome	0,001

Based on table 5 the results of calculations with the help of *SPSS 18* , the value of *sig. (2 tailed)* 0.001 <0.05, it can be concluded that there is an effect on student learning outcomes using *the mind mapping learning model .*

2. Discussion

Before testing the hypothesis using the *independent sample t-test* in the SPSS version 18 application, the researcher first tested the prerequisites, namely the normality and homogeneity tests. The normality test was analyzed using the Kolmogorov-Smirnov test. Based on the data analysis of the experimental class student learning outcomes in the *pretest, a* score of 0.594 was obtained, and the *posttest* obtained a score of 0.844. In contrast, the data analysis of the control class student learning outcomes in the *pretest* obtained a score of 0.726 and the *posttest* got a score of 0.620. From the results of the analysis of existing data with a score > 0.05, it can be said that the research data is normally distributed. Then based on the results of the analysis of the homogeneity test, it was obtained that the *posttest* score data of the experimental class and control class students with *sig* 0.054 > 0.05 was homogeneous.

After knowing that the data from the research were normal and homogeneous, it was continued by testing the average difference between the experimental class and the control class using the *independent sample t-test*. Based on the results of the analysis, the *output (sig)* of 0.001 < 0.05 so that H 0 was rejected and H 1 was accepted, it can be concluded that there is an effect on student biology learning outcomes using the *mind mapping* learning model. This can also be seen in the average value of the results of the *pretest* data analysis of the two classes. The control class obtained an average score of 50.8, which was higher than the experimental class, which was 48.1. However, after applying the *mind mapping* learning model to the

experimental class, the results of the *posttest* data analysis were obtained with an average value of the experimental class obtained at 72.5 while the control class got an average value of 59.6 where the average score of the experimental class was obtained. was higher than the control class.

The difference in the average score of student learning outcomes is based on the tests' results. The *mind mapping* learning model gives higher results than conventional learning models. The difference in learning outcomes is because the two learning models have different syntax or learning steps. The *mind mapping* learning model obtained a higher score because in its syntax, students were directed by the teacher to work in groups, looking for the main points of discussion in a material to make pictures in exciting plots of the subject matter which were then presented in class. Making mind maps helps improve students' concentration, imagination, and interest. In addition, students can solve problems and make exciting notes quickly. The mind mapping learning model maps all thoughts and is made visually, making it easier for students to describe or express ideas according to the mind map made.

The learning steps using the mind mapping model are as follows: 1) The teacher conveys the competencies to be achieved, 2) The teacher conditions the students into, 3) The teacher presents or recalls the material to be studied, 4) Next, the teacher distributes pieces of cards that have been written with the central concept to each group, 5) Assign one of the students in the group to tell the material that has just been received; other group friends listen to while making small notes, 6) The teacher asks each group to make a mind map image from the minor notes that have been made, 7) Each group, in turn, presents the results of the mind map that has been made, 8) The teacher re-explains the material that has not been understood.

Marxy (2017:175) argues that *mind mapping* is a creative, effective way of taking notes, and will literally map thoughts. Students can generate notices that provide a lot of information from a single page. So a long list of data can be diverted into an organized, easy-to-remember map that aligns with the brain's natural way of working.

The results of this study are also supported by the research of Anindita et al. (2018: 120) that *mind mapping* is a model that focuses on optimizing the work of the brain, where the left and right hemispheres of the brain are used simultaneously so that the formation of knowledge works comprehensively and meaningfully. Relevant research taken from Saragih's study (2018) reveals that *mind mapping* makes it easier for students to understand the concepts of a material so that easy to solve a problem in the learning material at hand. *Mind mapping* also helps students to reconstruct the information that students in the learning process have obtained.

The researcher concluded that working in groups would make students more active than just listening to learning materials. Therefore, the *mind mapping* learning model is highly recommended to be applied in learning because it can affect improving student learning outcomes and reduce boredom in learning because they can discuss each other in groups.

E. Conclusion

Biology learning outcomes for students of class XI MIA 1 as an experimental class using a *mind mapping* learning model obtained an average *posttest score of* 72.5. Biology learning outcomes of class XI MIA 2 students as a control class using conventional learning models obtained an average *posttest score of* 59.6. The results of data analysis using SPSS version 18 acquired a *sig* value of 0.001 <0.05, so it can be concluded that there is a significant difference in student biology learning outcomes between classes using *mind mapping* learning models and classes using conventional learning models.

F. References

Anindita dkk. (2018). Pengaruh Model Mind Mapping terhadap Hasil Belajar Siswa pada Materi Peristiwa Sekitar Proklamasi Kemerdekaan Ilmu Pengetahuan Sosial di Sekolah Dasar. *Jurnal Ilmiah Pendidikan Guru Sekolah Dasar*, Volume 5, Nomor 1, hal. 118–125.

Ikram. (2018). Perbandingan Hasil Belajar IPA Peserta Didik Yang Menggunakan Model Pembelajaran Kooperatif Tipe Two Stay-Two Stray(TS-TS) Dengan Tipe Think Pair Share(TPS) Kelas VIII Mts Negeri Gowa. *Skripsi*. Makassar: Program Pascasarjana UIN Alauddin Makassar.

Kismawati. (2018). Perbandingan Model Pembelajaran Kooperatif Tipe *Two Stay Two Stray* (TS-TS) dan *Think Pair Share* (TPS) terhadap Hasil Belajar Biologi Peserta Didik di Kelas X SMA Negeri 10 Maros.*Skripsi tidak dipublikasikan.* Maros: Program Pascasarjana Universitas Muslim Maros.

Kurniasari, dkk. (2013). *Model-Model Pembelajaran*. Pekalongan: STAI Negeri Pekalongan.

Marlina, Leny & Devy. (2017).Pengaruh Penerapan Model Mind Mapping terhadap Minat Belajar Siswa Kelas VII IPA dalam Mata Pelajaran Biologi di MTS Negeri Palembang, *Jurnal Bioilimi,* Volume 3, Nomor 1, hal. 26.

Marxy, A. (2017). Pengaruh Model Pembelajaran Mind Mapping Terhadap Hasil Belajar Matematika Siswa. *Jurnal Kajian Pendidikan Matematika*, Volume 2, Nomor 2, hal. 173–182.

Muzdalifa. (2018). Pengaruh Model Pembelajaran Mind Mapping terhadap Hasil Belajar Tema 2 Subtema 1 Peserta Didik Kelas IV SDN 2 Tanjung Senang. *Skripsi.* Bandarlampung: Program Pascasarjana Universitas Lampung.

Nurhidayah. (2018). Peningkatan Aktivitas & Hasil Belajar Biologi Siswa melalui Penerapan Model Pembelajaran Kooperatif Tipe STAD SMAN 2 Watampone. *Jurnal Binomial*, Volume 1, Nomor 1, hal. 1–10.

Rusman. (2014). *Model-Model Pembelajaran; Mengembangkan Profesionalisme Guru.* https://www.karyatulisku.com/2017/10/pengertian-hasil-belajar-dan-jenis-jenis-hasil-belajr.html. Diakses pada tanggal 18 Desember 2019.

Saragih, D. S., & Manurung, N. (2018). Pengaruh Model Mind Map terhadap Hasil Belajar Siswa pada Materi Sistem Ekskresi di Kelas XI IPA SMA Swasta Prayatna Medan. *Journal of Biology Education Science & Technology*, Volume 1, Nomor 1, hal. 21–28.

Sugiyono. (2018). *Metode Penelitian Pendidikan.* Bandung: Alfabeta.

Sujarweni. (2015). SPSS Untuk Penelitian. Yogyakarta: Pustaka baru Press

Suspriyati, dkk. (2013). *Biologi untuk SMA/MA Kelas XI*. Sidoarjo: Masmedia.

Trianto. (2010). *Model Pembelajaran Terpadu*. Jakarta: Bumi Aksara.

Zakky. (2018). *Pengertian Hasil Belajar dan Tujuan Hasil Belajar.* https://www.zonareferensi.com/pengertian-hasil-belajar/. Diakses pada tanggal 18 Desember 2019.