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The Influence Of Mnemonic Learning Models On Plant Tissue Material On Learning Outcomes Of Class XI Students Of SMA Negeri 4 Manado

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Abstract. *The low student learning results may be observed in the value decided by the teacher, which is less than the KKM's average value of 75. The purpose of this study is to determine the impact of the mnemonic learning model on student biology learning outcomes in class XI MIPA SMA Negeri 4 Manado during the academic year 2021/2022. This study used a quasi-experimental design. This study's sample included two classes: class XI MIPA 1 as an experimental class with 20 students and class X1 MIPA 2 as a control class with 20 students. The results showed that the average pretest and post-test learning outcomes obtained by students in class XI MIPA 1 (experiment) with the application of the pretest mnemonic learning model were 34.75 and 76.75, respectively, while the pretest and post-test learning outcomes obtained by students in class XI IPA 2 (control) with only conventional learning were 31.25 and 71.25, respectively. The value of* $t_{count} > t_{table}$ *was derived by hypothesis testing the pretest and post-test data in the experimental and control classes at a significant threshold of 0.05. The table value is 2.024, whereas the count value is 2.681.* H_0 *is rejected based on the hypothesis testing criterion, but* H_1 *is approved. This suggests that* H_0 *has no effect, however* H_1 *has an affect on student learning outcomes in Biology class XI at SMA Negeri 4 Manado.*

Keywords: *Mnemonic Learning Model, Learning Outcomes, Networks in Plants*

Abstrak. Rendahnya hasil belajar siswa dapat dilihat dari nilai yang diputuskan oleh guru yaitu kurang dari nilai rata-rata KKM yaitu 75. Tujuan penelitian ini adalah untuk mengetahui pengaruh model pembelajaran mnemonik terhadap hasil belajar biologi siswa kelas XI. MIPA SMA Negeri 4 Manado selama tahun pelajaran 2021/2022. Penelitian ini menggunakan desain quasi eksperimen. Sampel penelitian ini adalah dua kelas yaitu kelas XI MIPA 1 sebagai kelas eksperimen dengan jumlah siswa 20 orang dan kelas X1 MIPA 2 sebagai kelas kontrol dengan jumlah siswa 20 orang. Hasil penelitian menunjukkan bahwa rata-rata hasil belajar pretest dan posttest yang diperoleh siswa kelas XI MIPA 1 (eksperimen) dengan penerapan model pembelajaran mnemonic pretest masing-masing adalah 34,75 dan 76,75, sedangkan hasil belajar pretest dan posttest diperoleh oleh siswa kelas XI IPA 2 (kontrol) dengan pembelajaran konvensional saja masing-masing adalah 31,25 dan 71,25. Nilai $t_{hitung} > t_{tabel}$ diperoleh dengan pengujian hipotesis data pretest dan posttest pada kelas eksperimen dan kontrol pada ambang batas signifikan 0,05. Nilai tabel adalah 2,024, sedangkan nilai hitung adalah 2,681. H_0 ditolak berdasarkan kriteria pengujian hipotesis, tetapi H_1 disetujui. Hal ini menunjukkan bahwa H_0 tidak berpengaruh, namun H_1 berpengaruh terhadap hasil belajar siswa kelas XI Biologi SMA Negeri 4 Manado.

Kata Kunci : Model Pembelajaran Mnemonik, Hasil Belajar, Jaringan Pada Tumbuhan

INTRODUCTION

Biology requires a learning process. Therefore, teaching biology material requires a specific strategy to solve problems that arise in learning biology (Fadilah, 2015; Tanjung, 2016; Darmawan, 2021). In a teaching and learning process, the role of the teacher in schools is needed to help students achieve optimal learning outcomes (Manizar, 2015; Suwardi & Farnisa, 2018; Hapsari et al., 2021). Many students still think that learning is difficult, boring, and uninteresting, so few need help understanding the lessons (Wasingah, 2019; Firdausi, 2021; Rahardian, 2022).

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Plant tissue material is a biology learning material that requires student involvement in solving problems that arise in biology learning. Plant tissue material is the subject matter in class XI in odd semesters. The competence that must be achieved in tissue material in plants is to analyze tissue in plants and know the existing tissue in plants (Syaputri & Djulia, 2018; Zairana et al., 2020; Hidayah et al., 2021).

Based on the results of observations at SMA Negeri 4 Manado, it turns out that currently, there are many problems faced in learning biology, especially in plant tissue material; these problems include: students have not achieved learning competence in plant tissue material, students have no longer like to read, students are unable analyzing the questions that have been read, students are unable to answer the questions that have been given by the teacher and student learning outcomes at SMA Negeri 4 Manado are not maximized because students have not achieved learning competency in plant tissue material. The low ability of students to solve problems in learning Biology so that the learning outcomes obtained by students under the KKM and students do not like reading anymore, are unable to analyze the questions that have been read, and are unable to answer the questions that have been analyzed, so the researcher uses the mnemonic learning model because by using the mnemonic learning model students will further develop their thinking skills with problem-solving skills that the teacher will provide.

Based on the problems above, the researcher conducted a study entitled "The Influence of Mnemonic Learning Models on Plant Tissue Material on Learning Outcomes of Class XI Students of SMA Negeri 4 Manado."

METHOD

This research is quasi-experimental (quasi-experimental). Experimental research is control activity, manipulating activity, and observation. In experimental research, researchers divided the objects or subjects studied into two groups: the treatment group that received treatment and the control group that did not. This research is quasi-experimental, with the research design being the Posttest-Only Control Group Design. The design of this research can be described in Table 1 as follows:

Table 1. Research Design

X_1	O_1
X_2	O_2

Information :

R : Random (class randomization)

X1 : Treatment of the Mnemonic Learning Model (Experimental class)

X2 : Treatment with lecture method (control class)

O1 : Post-test experimental class

O2 : Post-test control class

The population in this study were all students of class XI MIPA, namely: XI MIPA1, XI MIPA2, and XI MIPA3 in school XI SMA Negeri 4 Manado, which consisted of 3 classes for the 2022/2023 school year. In this study, the sample was determined by taking 2 existing classes to be used as an experimental class and a control class—the same one.

The independent/dependent variable in this study is the mnemonic learning model. The dependent variable in this study is the results of studying biology in class XI SMA Negeri 4 Manado.

The data collection method is one of the ways/techniques that researchers can use to collect data. The data collection method used in this research is using a test. The test consists of 2 types, namely oral and written.

The written test used as a data collection tool is a multiple choice test with five choices (A, B, C, D, E). This test is in the form of pretest and posttest. The pretest is given before the teaching and learning activities, and the posttest is given after the teaching and learning activities.

RESULT AND DISCUSSION

A. Research Results

The research data that has been collected is in the form of quantitative data taken from two XI MIPA classes at SMA Negeri 4 Manado. The two classes are class XI MIPA 1 and XI MIPA 2, where the two classes are given different treatment. Class XI IPA 1 is an experimental class that applies the Mnemonic learning model, while class XI MIPA 2 is a control class that only applies the lecture method. The results of data analysis in the form of a pretest and posttest of the two classes can be shown in the table below:

Table 2. Data on the average learning outcomes of the experimental class

No.	Experimental class data		
	Statistics	**Pretest**	**Postestt**
1.	Total	**695**	**1580**
2.	Minimum Score	**15**	**65**
3.	Maximum Score	**65**	**95**
4.	Average	**34,75**	**79**
5.	Standard Deviation	**14,552**	**10,336**
6.	Variance	**211,776**	**106,842**

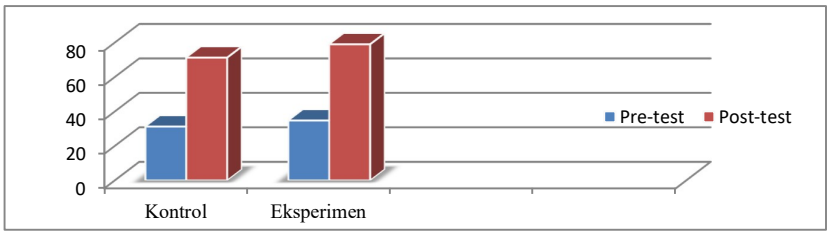
Table 3. Data on the average control class learning outcomes

No.	Control class data		
	Statistics	**Pretest**	**Posttest**
1.	Total	**625**	**1425**
2.	Minimum Score	**15**	**60**
3.	Minimum Score	**55**	**85**
4.	Average	**31,25**	**71,25**
5.	Standard Deviation	**13,462**	**8,251**
6.	Variance	**181,25**	**68,092**

The results showed that the average value of the pretest of student learning outcomes carried out before teaching and learning activities in the control class reached 31.25. At the same time, the pretest learning outcomes in the experimental type reached 34.75. The post-test learning outcomes in the control class came to a value of 71.25, while the practical class post-test learning achieved a score of 79.

The average value of the posttest learning outcomes obtained by students in class XI MIPA, 1 (experimental) with the application of the Mnemonic learning model, was higher than the learning outcomes of students in class XI MIPA 2 (control), which only applied conventional learning methods. The comparison of the average value of student learning outcomes from the experimental class and the control class can be seen clearly in.

Graph 1. Comparison of the average value of control class student learning outcomes with experimental classes



1. Normality Test

After collecting the learning outcomes data, a data normality test will be carried out. This normality test is intended to find out whether the data that has been collected is taken from the average population or not. The normality test used in this study is the Liliefors test using Microsoft Excel 2010. The results of the data normality test can be seen in Table 4.

Table 4. Results of the Control Class Pretest Normality Test

Control	Pre-test	Post test
N	20	20
X	31,25	71,25
L_{count}	0,178	0,125
L_{table}	0,190	0,190

Table 5. Posttest normality test results for the experimental class

Post-test	Pre-test	Post-test
N	20	20
X	34,75	76,75
L_{count}	0,148	0,174
L_{table}	0,190	0,190

Based on the results of the posttest data normality test in the experimental class, the value of $L_{count} < L_{table}$ was obtained. The obtained L_{count} value is 0.174, and the L_{table} value is 0.190. Thus the experimental class data is usually distributed.

2. Homogeneity Test

The homogeneity test is carried out after the data obtained is typically distributed. This homogeneity test is intended to see whether there are similarities between the two sample groups. The homogeneity test used in this study is the Fischer test using Microsoft Excel 2010. The results of the data homogeneity test can be seen in Table 6.

Table 6. Pretest data homogeneity test results

Pre-test Data	Experiment Class	Control Class
N	20	20
Var.s	211,776	181,25
F_{count}	1,168	
F_{table}	2,17	

Table 7. Data Pretest Experiment Class Control Class

Post-test Data	Experiment Class	Control Class
N	20	20
Var.s	106,842	68,092
F_{count}	1,569	
F_{tabel}	2,17	

Based on the pretest data homogeneity test results in the experimental and control classes with a significant level of 0.05, the value of $F_{count} < F_{table}$ was obtained. The F_{count} value obtained is 1.168, while the Ftable value is 2.17. While the results of the post-test data homogeneity test in the experimental and control classes obtained $F_{count} < F_{table}$. The F_{count} value obtained is 1.569, while the F_{table} value is 2.17. Thus, both types come from the same (homogeneous) population.

3. Hypothesis Test

After the prerequisite test is carried out, the next step is to test the hypothesis. This hypothesis test aims to see a comparison between student learning outcomes from the experimental group and the control group. The hypothesis test used is the T-test. The data will be tested using the post-test learning outcomes of the practical and control classes. The results of the data hypothesis test can be seen in Table 8.

Table 8. Posttest Data Hypothesis Test Results

Post-Test Data	Experiment Class	Control Class
N	20	20
Var.s	106,842	68,092
t_{count}	2,681	
t_{table}	2,024	

Based on the results of the post-test data hypothesis testing in the experimental and control classes with a significant level of 0.05, the value of tcount> ttable is obtained. The

count value obtained is 2.681, while the table value is 2.024. Following the hypothesis testing criteria, H_0 is rejected, and H_1 is accepted. This means there is a positive influence on improving students' biology learning outcomes by applying the Mnemonic learning model in class XI MIPA SMA Negeri 4 Manado.

B. Discussion

Experimental research conducted in class XI MIPA SMA Negeri 4 Manado showed that student learning outcomes in the practical course with the Mnemonic learning model were higher than student learning outcomes in the control class that applied conventional learning.

Learning with the Mnemonic learning model on plant tissue material can help students to understand and remember the content of the reading, which then seeks to find substantial parts to compose questions and answer them. Collecting questions from the material read can be used to assess students' thinking skills. The implementation of the Mnemonic learning model has also been shown to be able to encourage students to quickly memorize and remember the subject matter that has been given so that the learning process will be more effective and learning can be carried out, and understanding of the learning material can be successfully improved (Fauzi, 2015; Darusman, 2018; Nikmatussalimi, 2021)

This is, of course, inseparable from the activities in the Mnemonic model, which emphasize learning so that students make it easier to remember information that has been given by the teacher so that teaching and learning activities become more effective and encourage students to have memory in the teaching and learning process (Huda, 2013; Anisa, 2018; Uno, 2023).

The Mnemonic learning model can facilitate the process of understanding concepts well. If analyzed in depth, a teacher can use a technique to increase understanding and memory in the teaching and learning process so that students can understand and remember the material that a teacher has taught will motivate students to study harder. So that finally, they can achieve optimal learning outcomes (Toha, 2018; Haryani et al., 2021; Riadi, Muchisin, 2022).

Unlike the case with the control class, which only applies conventional learning methods. This learning is characterized by teacher-centered (teacher-centered). This learning method is based on a behavioristic view. In less varied education, students tend to be more passive because they only listen to lectures given by the teacher. Students wait until the teacher has finished explaining and then record what the teacher provides without interpreting the concepts shared. Compared to the control class, which only applies the lecture method, students in the experimental class have higher academic achievement because they use the Mnemonic learning

model to make students easier to understand and more effective, more independent, active, and willing to participate in education.

CONCLUSION

From the results of the research that the authors have described in the previous chapter, the Mnemonic learning model has a positive influence on improving students' biology learning outcomes in class XI MIPA SMA Negeri 4 Manado. This can be seen in the results of testing the hypothesis using the t-test; the value of count (2.681) > ttable (2.024) is obtained.

Based on the conclusions above, the researchers put forward suggestions, including:

1. Subject teachers are expected to be able to choose models, methods, or learning strategies that are appropriate and follow the material to be taught.
2. The Mnemonic Learning Model is suggested to be used in teaching and learning activities, especially in Plant tissue material.

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