

The Effectiveness Time Token Learning Model on Learning Outcomes of Biology Education Students

Rizki Amalia Nur^{1*}, Pertiwi Indah Lestari², Nurhidayah³, Rika Riyanti⁴

¹⁻⁴ Universitas Muslim Maros

* rizkiamalianur@umma.ac.id

Abstract

This study aims to determine the effectiveness of the application of the time-token learning model to biology learning outcomes at Universitas Muslim Maros. This type of research is quantitative and uses pre-experimental methods. The form of the pre-experimental method used is a one-group pretest-posttest. To determine the effectiveness of time-token learning, measurement and observation techniques are used. measurement technique by giving essay tests (pre- and post-tests). Based on the t-test calculation results, a sig (2-tailed) of 1.000 0.05 was obtained. Thus, it can be concluded that the application of the time token learning model is effectively used to improve student learning outcomes.

Keywords: *learning models, time tokens, learning outcomes*

Introduction

Biology is one of the subjects incorporated in the Natural Sciences (IPA) family. Biology is very influential in mastering science and technology which is very important in the world of education (Rosmaini, et al. 2011). The use of the right learning model in teaching it makes Biology lessons fun and enjoyable. Based on observations that have been made in odd semester Biology education courses, students tend to be less active in learning activities, especially in group discussions. Active students are just that, while others are less motivated and tend to be shy in expressing opinions. When the discussion took place, there were only a few students who paid attention and listened, others were just silent until the learning process was over. Lack of student involvement in the learning process results in low student learning outcomes. Low learning outcomes can be caused by many Biology is one of the subjects incorporated in the Natural Sciences (IPA) family. Biology is very influential in mastering science and technology, which is very important in the world of education (Rosmaini et al. 2011).

The use of the right learning model in teaching it makes biology lessons fun and enjoyable. Based on observations that have been made in odd-numbered semester biology education courses, students tend to be less active in learning activities, especially in group discussions. Students who are active are just that, while others are less motivated and less likely to speak up. When the discussion took place, only a few students paid attention and listened; others were just silent until the learning process was over. Lack of student

involvement in the learning process results in low student learning outcomes. Many factors can contribute to poor learning outcomes, including the use of ineffective teaching methods and low student motivation (Nugraha, 2020).

An alternative learning model that can encourage students to be more active in class discussions so that biology learning is more enjoyable is needed to solve this problem. One of the learning models that can make students more active in class discussions is the time token model. Time-token learning, according to Aris Shoimin (2017), is a type of cooperative learning in which students are organized into study groups and this learning focuses on social skills to prevent students from dominating the conversation or remaining silent when discussing. The time-token learning model is ideal for increasing students' enthusiasm for learning, encouraging them to raise their spirits, improving social skills, and reducing students who dominate speech and passive students in class (Nugraha, 2020).

This research is important to find the right solution to existing problems. The time-based learning model requires all students to be more active during classroom discussions. The purpose of this study is to determine the effectiveness of the application of the time-token learning model to the learning outcomes of students in the biology education study program at Maros Muslim University.

Method

This type of research is quantitative and uses pre-experimental methods. The form of the pre-experimental method used is a one-group pretest-posttest. The research design of one group's pretest-posttest is as follows:

Table 1. Research Design		
O ₁	X	O ₂

(Sugiyono, 2010)

Information:

X : Treatment (Time Token Learning Model)

O₁ : Pretest (before treatment)

O₂ : Posttest (after treatment)

The population in this study is all students of biology education at Universitas Muslim Maros, semesters I, III, and V and VII of the 2022–2023 academic year. The sample taken in this study was a V-semester student. To determine the effectiveness of time-token learning, measurement and observation techniques are used. Observations are carried out to determine the implementation of the RPS and the learning syllabus using measurement techniques such as providing essay tests (pre- and post-tests). The data obtained through the test were analyzed using descriptive statistics and inferential statistics. Descriptive statistics for calculating the highest value, the lowest value, and the average of the values in the form of tables and diagrams Inferential statistics is performed by performing a t-test, which was previously performed as a mality test to determine whether the data is normally distributed or not.

Results

Descriptive Statistical Analysis of Learning Outcomes The following describes the results of the descriptive value data analysis of pretest learning outcomes tests before applying the time token learning model and posttest learning outcomes after applying the time token learning model that has been obtained. The results can be seen in Table 1 below.

Table 1. Descriptive Value of Learning Outcomes

	Pretest	Posttest
N	10	10
Range	20	15
Minimum	45	80
Maximum	65	95
Mean	57,50	88,50
Std. Deviation	6,346	5,297

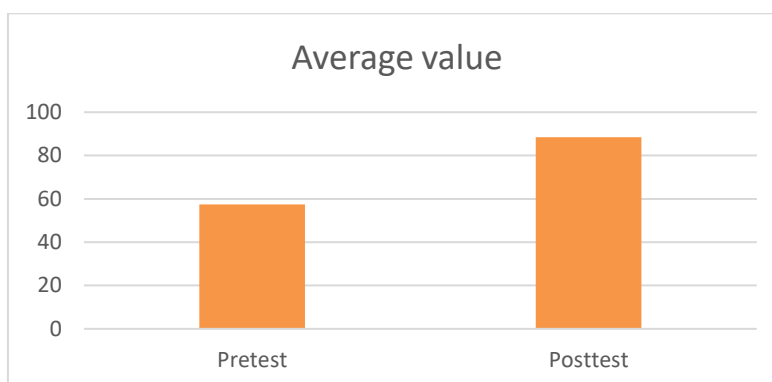


Figure 1. Histogram of Average Value of Learning Outcomes

Based on Table 1 above, it can be seen that the lowest pretest learning outcome scores are 45 and the highest posttest scores are 80. The highest score on the pretest is 65, and on the posttest it is 95. The average pretest score was 57.50, and the average posttest score was 88.50. While std. The pre-test deviation is 6.346, while the post-test deviation is 5.297. Table 2 in the list of learning outcomes below shows how all of the students' scores fit together.

Table 2 Frequency Distribution and Percentage of Pretest and Posttest Learning Outcomes

Value Interval	Category	Pretest Value		Posttest Values	
		Frequency	Percentage	Frequency	Percentage
85-100	Very High	0	0	9	90%
65-84	Tall	2	20%	1	10%
55-64	Keep	6	60%	0	0
35-54	Low	2	20%	0	0
0-34	Very Low	0	0	0	0

Table 2 shows that the percentage of students in the pretest score or before applying the time token learning model that falls into the very high category does not exist; 20% are categorized as having a high score of 2 people, 60% are categorized as having a medium score of 6 people, 20% have a low score of 2 people, and no student has a score in the very low category. Meanwhile, after the implementation of the time token learning model, no student obtained medium, low, or very low scores; 90% of students were in the very high category, as many as 9 people, and 10% were in the high category, namely, 1 person.

From the existing data, it can be seen that there is an increase in the number of students who fall into the "very high" category in the posttest score, whereas previously in the pretest, no student achieved a very high score. As a result, using the time token model learning model improves student learning outcomes more than not using the time token model. The categories of learning outcomes can be seen in the following bar chart:

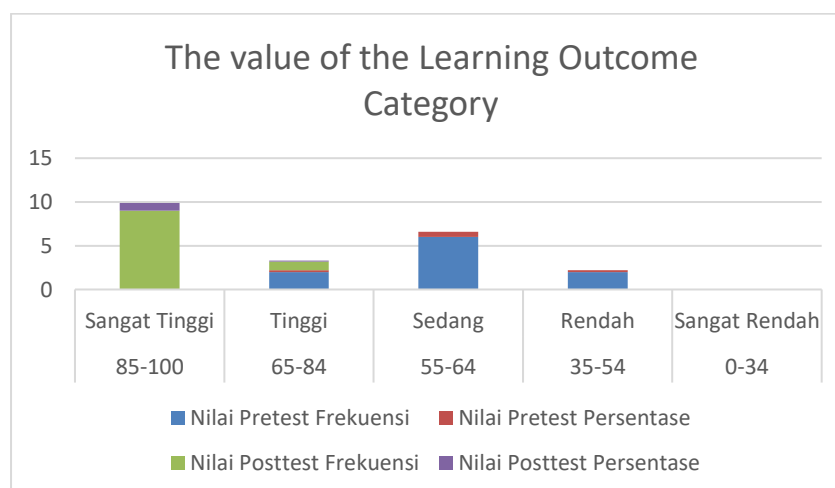


Figure 2. Value Histogram of Learning Outcomes Category

Inferential Statistical Analysis

Data analysis techniques using SPSS Version 25 for Windows for inferential analysis use t-tests. However, before the previous t-test, a prerequisite test was carried out, namely the normality test. Normality tests are carried out to find out whether the data from the pretest and posttest values are normally distributed or not. The normality test can be seen in Table 3 below.

Table 3. Normality Test Value Results

Student Learning Outcomes	Class	Shapiro-Wilk		
		Statistic	df	Itself.
	Pretest	.903	10	.104
	Posttest	.948	10	.229

Based on Table 3 above, the normality test using the Hapiro-Wilk S formula on the pretest and posttest data is declared normally distributed. This can be seen from the pretest value of Sig.104 greater than 0.05 and the posttest value of Sig.229 greater than 0.05.

After the prerequisite test is carried out, namely the normality test, and the normally distributed data is known, the t-test is carried out. The test was carried out to test the existing hypothesis, namely, the effectiveness of applying the time token model in improving student learning outcomes. The results of the t-test can be seen in Table 4 below.

Table 4. Results of t-Test Values

Inferential Analysis	Condition	Analysis Results	Information
<i>T-test</i>	$T_{hit} < t_{table}$ Sig (α) < 0.05	,000 < 0,05	H_0 rejected = Significant

Based on the results of the t-test calculations from Table 4 above, a sig (2-tailed) of .000 0.05 was obtained. Thus, it was concluded that H_0 was rejected, and H_1 was accepted, which means that the application of the time token learning model is effectively used to improve student learning outcomes in Semester V of the AMDAL course.

Discussion

Based on the research results that have been described above, the use of the time token learning model is effectively used to improve student learning outcomes in Semester V of the AMDAL Course. The factors that cause it are that, after using the Time Token Learning Model, students understand much more about the AMDAL material, are more creative, and

can develop their abilities in making learning concepts interesting. In addition, the Time Token Learning Model can also train students' thinking flow because the beginning of learning is also given a problem that allows students to be able to solve problems and train to speak in front during discussions to express their opinions. Students who tend to be less excited about class discussions will be motivated by the opportunity and time to ask questions and express what they want to say. so that students become more enthusiastic about the teaching and learning process. This research is in line with research (Mahasiswa et al., 2019) that states that the application of the Time Token learning model can improve students' mathematical problem-solving abilities as seen from the results of students' problem-solving ability tests, so that the learning model is effectively used in learning.

In this study, mahasiswa were divided into small groups for learning, and researchers then taught social skills to prevent mahasiswa students from dominating speech or remaining silent during discussions. Researchers provide AMDAL learning materials, and then students work in their respective groups to ensure that all group members have mastered the learning materials provided. This learning model invites students to be active, so it is appropriate to use in speaking learning, where it really invites students to be active and learn to speak in public, expressing their opinions without having to feel embarrassed. The positive impact of this learning model in improving the learning process of deliberation for consensus is in addition to the fact that this model also has a positive impact on student learning activities through participation in learning.

The assessment of student learning outcomes in the AMDAL course is based on the results of the posttest in the experimental class. sig (2-tailed),000 0.05 obtainedThus, it was concluded that H0 was rejected, and H1 was accepted, which means that the application of the time token learning model is effectively used to improve student learning outcomes in Semester V of the AMDAL course. This shows that the application of the Time Token learning model has a positive impact on improving student learning outcomes. In line with this, Ferawati Rurua et al. (2017) stated from the results of their research that there is a significant influence of the time token learning model on student learning outcomes about cell biology in the Biology Education Study Program at Sintuwu Maroso University, and Musyafar (2010) stated that students who learn with the time token learning model have higher learning outcomes compared to students who do not use the time token learning model.

Mauliza (2016) discovered that the application of the time token learning model affects student learning outcomes on respiratory system material in Class XI science sma Negeri 5 Banda Aceh, which is consistent with this research. This is also proven in this study, where students who study using the time token learning model obtain learning outcomes with an average score of 83.97. These learning outcomes are different from those of students who study without using the time token learning model, with an average of 78.08. In line with this, Rosmaini et al. (2011) and Popla & Arini (2019) found that using a time-token cooperative learning model improved biology learning outcomes.

Conclusion

Based on the results of the data analysis and hypothesis tests carried out in this study, it can be concluded that the application of the time token model is effectively applied in learning, as can be seen from the learning outcomes of students of the Biology Education Study Program at Maros Muslim University in the AMDAL course.

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