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The Effect of The Mysterious Physics Learning Model Based on Fun Learning on The Physics Learning Outcomes

Pertiwi[1)*], Harnipa [2)], NurhikmahHasan [3)], TitinFatmawati [4)]

[1)]Department of Physics Education, Universitas Pancasakti, Makassar, 90132, Indonesia
[4)]Science Subject, SMPN 2 Barombong, Gowa, 90225, Indonesia

**Corresponding author: pannupertiwi@gmail.com*

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Abstract *This study aims to identify whether the mysterious physics learning model based on fun learning has an effect on the physics learning outcomes of the students of SMPN 2 Barombong. This study was a pre-experimental study with one group joined pretest-posttest research design. This study was carried out at SMPN 2 Barombong in November 2021 so that the population was all the students of class IX while the sample was class IX.B which was determined by simple random sampling technique. Data analysis used Wilcoxon signed rank test statistic. The results showed that there was a positive and significant influence of the mysterious physics learning model based on fun learning on the physics learning outcomes of SMP Negeri 2 Barombong students.The results of the student questionnaire also showed interest in learning physics. They considered it as a more challenging physics learning project that made them more enthusiastic about it.The conclusion obtained isthe implementation of physics mysterious learning based on fun learning are effective in increasing students' knowledge, motivation, and their attitudes as well.*

Keywords:*fun learning; mysterious physics learning model; physics learning outcomes*

I. INTRODUCTION

The power of digital technologies has given a big impact in transforming societies' assumption that technology can be a great equalizer in public services. Especially welcome the era of society 5.0 where people, objects and systems are interconnected in a virtual space which is analyzed and than presented back to the real space to be utilized by humans (Setiyani & Nining Nurcahyo, 2020).The impact of this era is perspectives of materialism and existentialism are seen as critical times because society is vulnerable to devision if it is not directed properly (Rahmawati et al., 2021). To responses to these challenges, the students as the next generation must be prepared carefully in order to conquer this global shift.

Education holds essential aspect of human development to help them broaden their understanding facing all challenges. This indicates that we need to innovate our education system learning process based on 21st century integration.

Numerous statement about 21st century skills, one of them is the *US-based Partnership for 21st Century Skills (P21)*Zubaidah (2018), identified Critical Thinking Skills, Creative Thinking Skills, Communication Skills, and Collaboration Skills which are commonly referred as 4C skills. These skills can be developed in learning in educational institutions(Arnyana, 2019).

The 4C learning has been applied and the interesting part is how students' learning outcomes deal with various problems they have encountered, moreover in science subjects, especially in physics. Physics is a science subject that learns parts of nature and their interactions is in it (Rahman & Salim, 2015). Most mysteries of nature can be explained by physical theories.

Studying physics requires both cognitive and practical experiences. Octavia Rosa & Rahman Aththibby (2021) that in physics learning students are encourage to obtain experiences by using knowladge and skill owned included in explaining the mysterious of physics. However, based on the science subject teachers' interview, it is known that students lack in many aspects. They are able to solve the problems that are exactly the same as the examples given because of they have an ability to memorize. Mostly they are still lack in many different problems that require cognitive and practical experiences such as combining understanding of a material with other materials, evaluating a situation, analyzing, and interpreting. Meanwhile, the students' interview result stated that they prefer to play games than study. They seemed to be convinced that learning physics requires congenial and natural talent to achieve expertise. The reason are because it is still focusing on the use of formulas in solving problems. As a result, students who are lack in Mathematic are getting fed up and end up by attending their class only to fulfill the requirements. This observation are supported by NurAsiah'sobservation (2021) that based on student behavior during the learning process it indicates unpleasant learning. Therefore, the learning process should be conducted as interesting as possible in order to meet students' need and teaching's goals.

The main function of teaching and learning is to guide student to modify their initial understansing towards the expert views (Bao & Koenig, 2019). Learning models which is suitable to the purpose and characteristics of subjects can activate students in the learning process (Rachma Thalita et al., 2019). Some learning models have been carried out to see their impact on student learning outcomes. For example cooperative learning model by Irwan et al., (2015),

Komikesari (2016) and Rahman (2021), STEM Based Virtual Laboratory (PheT) by Laila & Anggaryani (2021), a contextual semi assisted project base learning by Satriawan et al., (2021), E-learning by Mamonto et al., (2021) and many others.

One of the teaching models that can be used to improve students' interest is "The Physics mysterious learning based on fun learning*"*. Saputro (2016) revealed that it can be a solution in overcoming students' difficulties in understanding physics concepts since the physics lesson was designed to be more fun to trigger students to be more creative, analytical and innovative. Based on the research results stated by (Irmawati et al., 2017), the *Physics mysterious learning based*on*fun learning* was able to increase the students' interest and learning outcomes of 7th grade students of MTsN 3 Bone. Therefore, the problem in this this study whether the mysterious physics learning model based on fun learning has an effect on the physics learning outcomes of the students of SMPN 2 Barombong. This study aims to identify whether the mysterious physics learning model based on fun learning has aneffect on the physics learning outcomes of the students of SMPN 2 Barombong.

II. METHODS

This research was conducted in pre-experimental design with one group pretest-posttest design. The research design used can be seen in figure 1below (Setiyoaji et al., 2021).

Pre-Test	Treatment	Post-Test
O_1	X	O_2

Figure 1. One group pretest-posttest design

It was carried out at State Junior High School 2 Barombong used static electricity which took place in November 2021. The population of this study was all the 9th grade students of State Junior High School 2 Barombong consist of 350 students who were placed in 9 homogeneous classes. This research used simple random sampling technique that the students were selected from class IX. B as its sample.

Data on students' physics learning outcomes were obtained from the pre-test and post-test. The research instrument used in this study had previously been tested for the validity and reliability of the instrument. While the research activities can be seen in table 1 below

Table 1. Research activities

Pre-test	Treatment	Post-test
Measure students' initial ability about static electricity by answering 8 questions before applying the mysterious physics learning model based on fun learning	Learning process by applying a mysterious physics learning model based on fun learningwhere students are given mysterious facts related to statics electricity	measuring students' ability about static electricity by answering 8 questions after applying the mysterious physics learning model based on fun learning

The data to see the effectiveness of the mysterious physics learning based on fun learning is seen through the students' questionnaire response and the completeness of students' learning outcomes. The prerequisite test used normality test and hypothesis test using Wilcoxon signed rank test statistic because the data was not normally distributed. The data analisys techniques used IBM SPSS 16 and results can be seen in the results and discussion section.

III. RESULTS AND DISCUSSION

The learning outcomes scores obtained from the students' pre-test and post-test were analyzed to find out the effect of the mysterious physics learning model based on fun learning on students' physics learning outcomes in the matter of motion in simple planes. The results of the students' pre-test and post-test can be described as follows:

Table 2. Descriptives analysis

Descriptives	Pre-Test	Post-Test
Mean	62.143	78.107
Median	60.000	78.000
Std. Deviation	2.785	3.900
Minimum	60.000	70.000
Maximum	70.000	88.000

The data shown in bar of frequency distribution :

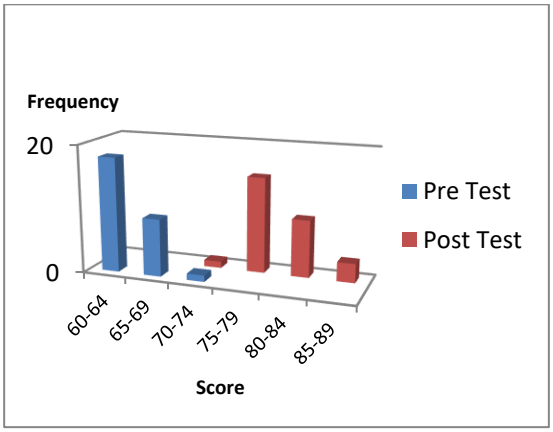

Figure 2. Frequency distribution

Based on the descriptive analysis above, it can be seen that the post-test score higher than the pre-test. Meanwhile, to see the effect of the mysterious physics learning model based on fun learning on students' physics learning outcomes in the matter of motion can only be known after testing the hypothesis.

Prerequisite test was carried out with normality test with the help of IBM SPSS 16. The following results were obtained:

Table 3. Test of Normality

	Sig. Kolmogrov-Smirnov	Sig. Shapiro-Wilk
Pre-test	0.000	0.000
Post-test	0.002	0.011

Based on the output above, it is known that both the Kolmogorov-Smirnov and the Shapiro-Wilk tests showed a significance value (Sig.) for all data in the pre-test and post-test was <0.05. It can be concluded that the data were not normally distributed.

Hypothesis testing was carried out using the Wilcoxon signed rank test with the help of IBM SPSS 16 with the following outputs:

Table 4. Ranks

		N	Mean Rank	Sum of Ranks
Post	Negatif-	0[a]	.00	.00

Test-Pre Test	Ranks Positif-Ranks	28[b]	14.50	406.00
	Ties	0[c]		
	Total	28		

a Post Test <Pre Test, b Post Test > Pre Test, c Post Test = Pre Test

Table 5. Test Statistic

	Post Test - Pre Test
Z	-4.644[a]
Asymp. Sig. (2-tailed)	.000

a Wilcoxon Signed Ranks Test

b Based on negative ranks

Based on the results of the data analysis in table 4 above, it is shown that the Negative Ranks or the difference (negative) between knowledge for the pretest and posttest is 0. This value indicates that there is no decrease in the value from the pretest to the post-test score.

Meanwhile, the Positive Ranks or the difference (positive) shows that the value of N 28 is positive, which means indicates that all students have experienced an increase in knowledge. The mean rank or the average increase is 14.50, while the number of positive rankings or the sum of ranks is 406.00.

Based on the results of the data analysis using SPSS above, it is also showed that none of the students have the same score on the pre-test and post-test. From the table 3 above, it was found that the 2-tailed sig value was (2-tailed) < 0, which means that there is a significant influence regarding the implementation of the mysterious physics learning model based on fun learning toward students' result in learning physics before and after being taught.

To determine effect of the mysterious physics learning model based on fun learning on students' physics learning outcomes, the effect size test was used. Based on Pratiwi (2018), to calculate the effect size if the data is not normally distributed, the following equation is used: $r = \frac{z}{\sqrt{N}}$

Where the z value is obtained from the results of hypothesis testing using the Wilcoxon signed rank test with the help of IBM SPSS 16, while N is 2 times of the total respondents. This study indicated the effect size value was 0.62 or equal 38% value of the mysterious physics learning. It can be seen that there is a significant influence of the physics mysterious learning based on fun learning towards the students learning outcomes of SMPN 2 Barombong.

This study conclude that physics mysterious learning based on fun learning towards the students learning. Silimar results were obtained by Saputro & Winingsih (2017) that by using physics mysterious shows 95% of student can answer calculation questions and understanding concepts. Students are even expected to be able to answer problems without applying formulas, although mathematical knowledge is still needed to predict answer.

This learning model presents fun learning to enhance students' engagement and

motivation to be actively involved in the learning process.It's because having fun dan enjoying the learning also relieves stress and express more confidence in their learning (Lucardie, 2014). This is similar with research by Pujiman et al. (2021) that a conducive learning encourages a sense of comfort for student, so that students are motivated to participate in the learning process with pleasure. The same thing was expressed by Avrilliyanti & Budiawanti (2013) that if students feel comfort in learning process, they will be totally involved in the learning process to improved their performance and learning outcome.

In addition to providing fun learning activities, this learning model also has a challenging effect on student. The results of the student questionnaire also showed interest in learning physics. They considered it as a more challenging physics learning project that made them more enthusiastic about it. (Syanurdin, 2020) challenging learning is needed in developing students' critical thingking and problem solving, creative and innovative skills, collaboration and communication where this learning becomes the goal of 21st century learning.(Yulianti & Gunawan, 2019) classify that challenging learning can be used to improve students's problem learning.

Learning that is challenging and fun is needed to be applied in the class. Both can contribute to attractiving attention and motivating students in learning to complete challenges and appear confidently so that their learning outcomes are better. Especially in learning physics where sometimes contain mysterious thing that must be explained scientifically. In addition, it requares knowledge of mathematics to predict the conclusion. So Physics mysterious learning based on fun learning can be use in learning physics.

IV. CONCLUSION AND SUGGESTION

Based on this study, it can be concluded the implementation of Physics mysterious learning based on fun learning are effective in increasing students' knowledge, motivation, and their attitudes as well. It can be seen from the students' achievement that are significantly have experienced differences. The students are likely behave better since they show their desire to be actively participated during learning process and had achieved higher level in their academic.

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