JPF | Volume 10 | Number 1 | 2022 | 50 - 57

p - ISSN: 2302-8939
e - ISSN: 2527-4015

Jurnal Pendidikan Fisika

https://journal.unismuh.ac.id/index.php/jpf

DOI: 10.26618/jpf.v10i1.7087

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

Pertiwi[1)*], Harnipa [2)], Nurhikmah Hasan [3)], Titin Fatmawati [4)]

[1,2,3)]*Department of Physics Education, Universitas Pancasakti, Makassar, 90132, Indonesia*
[4)]*State Junior High School 2 Barombong, Gowa, 90225, Indonesia*

**Corresponding author: pannupertiwi@gmail.com*

Received: December 3, 2021; Accepted: December 28, 2021; Published: January 30, 2022

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. This study was a pre-experimental study with one group joining the pretest-posttest research design. This study was carried out at SMPN 2 Barombong in November 2021. The population was all the students of class IX, while the sample was class IX.B which was determined by a 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 students at SMPN 2 Barombong. The results of the student questionnaire also showed interest in learning physics. They considered it as a more challenging physics learning project which made them more enthusiastic about it. The conclusion obtained is that the implementation of mysterious physics learning based on fun learning is effective in increasing students' learning outcomes in physics learning.*

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

I. INTRODUCTION

The power of digital technologies has had 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 then presented back to the real space to be utilized by humans Ismail et al., (2016); Sirait et al., (2017); Setiyani et al., (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 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 of facing all challenges.

This indicates that we need to innovate our education system learning process based on 21st-century integration. There are numerous statements about 21st-century skills, including critical thinking skills, creative thinking skills, communication skills, and collaboration skills, which are commonly referred to as 4C skills (Zubaidah, 2018). These skills can be developed in learning in educational institutions (Arnyana, 2019). The 4C learning has been implemented, and what is interesting is how students' learning outcomes deal with various problems they have encountered, moreover in science subjects, especially physics. Physics is a science subject that studies the parts of nature and their interactions (Fatima et al., 2014; Aththibby, 2015). Most mysteries of nature can be explained by physical theories.

Studying physics requires both cognitive and practical experiences. Rosa & Aththibby (2021) said that in physics learning, students are encouraged to obtain experiences by using knowledge and skill owned included in explaining the mysterious of physics. However, based on the science subject teachers' interviews, it is known that students lack in many aspects. They are able to solve problems that are exactly the same as the examples given because they have an ability to memorize. Mostly they are still lacking in many different problems that require cognitive and practical experiences such as combining the understanding of the material with others, evaluating a situation, analyzing, and interpreting. Meanwhile, the students' interview results 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 is that it is still focusing on the use of formulas in solving problems. As a result, students who are lack in mathematics are getting fed up and end up by attending their classes only to fulfill the requirements. This observation is supported by Asiah's observation (2021) that based on student behavior during the learning process indicates unpleasant learning. Therefore, the learning process should be conducted as interesting as possible in order to meet students' needs and teaching goals.

The main function of teaching and learning is to guide the student to modify their initial understanding towards the expert views (Bao & Koenig, 2019). Learning models which are suitable to the purpose and characteristics of subjects can activate students in the learning process (Thalita et al., 2019). Some learning models have been carried out to see their impact on student learning outcomes. For example, the cooperative learning model by (Irwan & Sani, 2015; Sari, 2016; Rahman, 2021), STEM-based virtual laboratory (PhET) by Laila and Anggaryani (2021), a contextual semi assisted project based-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' learning outcomes is the mysterious physics learning based on fun learning. Saputro (2016) revealed that it could be a solution to overcome students' difficulties in understanding physics concepts since the physics lesson was designed to be more fun and trigger students to be more creative, analytical, and innovative. Based on the study conducted by Irmawati et al. (2017), the mysterious physics learning based on fun learning was able to increase the students' interest and learning outcomes of 7th-grade students of MTsN 3 Bone. The problem in this research is that students' learning outcomes in physics at the state junior high school 2 Barombong (SMPN 2 Barombong) are low. Therefore, 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 at SMPN 2 Barombong.

II. METHODS

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

Pre-Test	Treatment	Post-Test
O_1	X	O_2

Figure 1. One group pretest-posttest design

This study was carried out at SMPN 2 Barombong using static electricity which took place in November 2021. The population of this study was all the 9th-grade students of SMPN 2 Barombong consisting of 350 students who were placed in 9 homogeneous classes. This research used a simple random sampling technique that the students were selected from class IX. B as a 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 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
Measuring 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 learning 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 effectiveness of the mysterious physics learning based on fun learning is seen through the students' questionnaire responses and the completeness of students' learning outcomes. The pre-requisite test used a normality test, and the hypothesis test used Wilcoxon signed-rank test statistic because

the data was not normally distributed. The data analysis techniques used SPSS.

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 static electricity. 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	62.14	78.11
Median	60.00	78.00
Std. Deviation	2.79	3.90
Minimum	60.00	70.00
Maximum	70.00	88.00

Based on the descriptive analysis above, it can be seen that the post-test score was higher than the pre-test. The average learning outcome of students after applying the mysterious physics learning model based on fun learning is 78.11, which is an increase from the pre-test score of 62.14. Meanwhile, to see the effect of the mysterious physics learning model based on fun learning on students' physics learning outcomes in the matter of static electricity can only be known after testing the hypothesis. Pre-requisite test was carried out with a normality test with the help of IBM SPSS. The following results were obtained:

Table 3. Results of normality test

	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 means that the data were not normally distributed.

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

Table 4. Results of Wilcoxon signed-rank test

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

Based on the results of the data analysis in Table 4 above, it is shown that the negative ranks or the difference (negative) between the pre-test and post-test are 0. This value indicates that there is no decrease in the value from the pre-test 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. The results of the hypothesis test can be seen in Table 5 as follow.

Table 5. Result of the hypothesis test

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

a Wilcoxon Signed Ranks Test

b Based on negative ranks

From 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 on students learning outcomes in physics before and after being taught. To determine the effect of the mysterious physics learning model based on fun learning on students' physics learning outcomes, the effect size test was used. 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 mysterious physics learning based on fun learning on the students' learning outcomes of SMPN 2 Barombong.

The results of this study have shown that the mysterious physics learning model based on fun learning has an effect on students' learning outcomes. Similar results were obtained by Saputro and Winingsih (2017) that using mysterious physics shows 95% of students can answer calculation questions and understand concepts. Students are even expected to be able to answer problems without applying formulas, although mathematical knowledge is still needed to predict the answer.

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

In addition, to providing fun learning activities, this learning model also has a challenging effect on the student. The results of the student questionnaire also showed interest in learning physics. They considered it as a more challenging physics learning project, which made them more enthusiastic about it. Syanurdin (2020) argued that the 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. Challenging learning can also be used to improve students' problem learning (Yulianti & Gunawan, 2019).

Challenging and fun learning are needed to be applied in the class. Both can contribute to attracting attention and motivating students in learning to complete challenges and appear confidently so that their learning outcomes are better, especially in learning physics which sometimes contain mysterious thing that must be explained scientifically. In addition, it requires knowledge of mathematics to predict the conclusion. So mysterious physics learning based on fun learning can be used in learning physics.

IV. CONCLUSION AND SUGGESTION

Based on this study, it can be concluded that the implementation of mysterious physics learning based on fun learning is effective in improving student learning outcomes during physics learning. This can be seen from the students' learning achievement which is significantly different from the pre-test and post-test. Through this model, students tend to behave better by showing their desire to actively participate during the learning process.

The implementation of mysterious physics learning based on fun learning can be an alternative for physics teachers in improving student learning outcomes. However, this study has several weaknesses, including there is no comparison class. Therefore, to support the results that have been obtained, it is recommended for further researchers to use a comparison class in order to test the effects of this learning model.

REFERENCES

Arnyana, I. B. P. (2019). Pembelajaran untuk meningkatkan kompetensi 4C (communication, collaboration, critical thinking dan creative thinking) untuk menyongsong era abad 21. *Prosiding: Konferensi Nasional Matematika dan IPA Universitas PGRI Banyuwangi*, *1*(1), 1-13.

Asiah, N. (2021). The effect of guided inquiry learning models on students' critical thinking skills and learning outcomes in science subjects at MTs Miftahul Muin. *Jurnal Pendidikan Fisika, 9*(2), 165–177. https://doi.org/10.26618/jpf.v9i2.5141

Aththibby, A. R. (2015). Pengembangan media pembelajaran fisika berbasis animasi flash topik bahasan usaha dan energi. *Jurnal Pendidikan Fisika*, *3*(2). 25-33. http://dx.doi.org/10.24127/jpf.v3i2.238

Avrilliyanti, H., Budiawanti, S., & Jam, J. (2013). Penerapan media komik untuk pembelajaran fisika model kooperatif dengan metode diskusi pada siswa SMP Negeri 5 Surakarta kelas VII tahun ajaran 2011/2012 Materi Gerak. *Jurnal Pendidikan Fisika*, *1*(1), 156-163.

Bao, L., & Koenig, K. (2019). Physics education research for 21st century learning. *Disciplinary and Interdisciplinary Science Education Research*,*1*(2), 1-12. https://doi.org/10.1186/s43031-019-0007-8

Fatima, Yusuf, I., & Bancong, H. (2014). Implemantasi pembelajaran kurikulum 2013 berbasis multimedia interaktif pada pokok bahasan listrik magnet terhadap aktivitas, persepsi, dan hasil belajar peserta didik di SMA Tut Wuri Handayani Makassar. *Jurnal Fisika Indonesia* *18*(53), 62-65. https://doi.org/10.22146/jfi.24392

Irmawati, Djamaluddin, M., & Wahyuni, A. (2017). Pengaruh model pembelajaran kooperatif physics mysterious berbasis fun learning terhadap minat dan hasil belajar peserta didik kelas vii Mtsn 3 Bone. *JPF (Jurnal Pendidikan Fisika) Universitas Islam Negeri Alauddin Makassar*, *5*(1), 6-9. https://doi.org/10.24252/jpf.v5i1.2991

Irwan, N., & Sani, R. A. (2015). Efek model pembelajaran kooperatif tipe group investigation dan teamwork skills terhadap hasil belajar fisika. *Jurnal Pendidikan Fisika*, *4*(1), 41-48. https://doi.org/10.22611/jpf.v4i1.2567

Ismail, I., Permanasari, A., & Setiawan, W. (2016). STEM virtual lab: An alternative practical media to enhance student's scientific literacy. *Jurnal Pendidikan IPA Indonesia*, *5*(2), 239–246. https://doi.org/10.15294/jpii.v5i2.5492

Laila, S. I., & Anggaryani, M. (2021). The use of stem-based virtual laboratory (PhET) of newton's law to improve students' problem solving skills. *Jurnal Pendidikan Fisika*. *9*(2), 125–133. https://doi.org/10.26618/jpf.v9i2.5078

Lucardie, D. (2014). The impact of fun and enjoyment on adult's learning. *Procedia - Social and Behavioral Sciences*, *142*, 439–446. https://doi.org/10.1016/j.sbspro.2014.07.696

Mamonto, M. R., Odja, A. H., & Abdjul, T. (2021). The effect of e-learning application through the use of whatsapp-assisted edmodo on the students' learning outcomes in the concept of sound waves. *Jurnal Pendidikan Fisika*, *9*(1), 56-62. https://doi.org/10.26618/jpf.v9i1.4361

Pujiman, Rukayah, & Matsuri. (2021). Penerapan prinsip manajemen kelas dan pengaruhnya terhadap motivasi belajar siswa di sekolah dasar. *JPI (Jurnal Pendidikan Indonesia): Jurnal Ilmiah Pendidikan*, *7*(2), 124-128. https://doi.org/10.20961/jpi.v7i1.47616

Rahman. (2021). Readiness of junior high school students to follow natural science learning by using cooperative learning model. *Jurnal Pendidikan Fisika*. *9*(2). 209-220. https://doi.org/10.26618/jpf.v9i3.5128

Rahmawati, M., Ruslan, A., & Bandarsyah, D. (2021). The era of society 5.0 as the unification of humans and technology: a literature review on materialism and existentialism. *Jurnal Sosiologi Dialektika*, *16*(2), 151-162. https://doi.org/10.20473/jsd.v16i2.2021.151-162

Rosa, F. O., & Aththibby, A. R. (2021). Exploring collaborative problem-solving competency of junior high school students. *Jurnal Pendidikan Fisika*, *9*(3), 231-242. https://doi.org/10.26618/jpf.v9i3.5856

Sari, H. K. (2016). Peningkatan keterampilan proses sains dan hasil belajar fisika siswa pada model pembelajaran kooperatif tipe student team achievement division. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, *1*(1), 15-22. https://doi.org/10.24042/tadris.v1i1.886

Saputro, H. (2016). Inspirasi fisika misteri sebagai problem solving pembelajaran sains dalam menyongsong MEA. *Science Tech Jurnal Ilmiah Ilmu Pengetahuan dan Teknologi*. *2*(2), 6-10. https://doi.org/10.30738/jst.v2i2.395

Saputro, H., & Winingsih, P. H. (2017). Pgasing dengan metode fisika misteri untuk pemahaman konsep torsi siswa kelas XI di SMAN 1 Balikpapan. *Jurnal Penelitian LPPM IKIP PGRI Madiun*. *5*(1), 83-88.

Satriawan, M., Liliasari, L., Setiawan, W., Abdullah, A. G., & Rosmiati, R. (2021). A contextual semi-assisted project-based learning on ocean wave energy: pre-service physics teachers' perceptions. *Jurnal Pendidikan Fisika*, *9*(1), 1–13. https://doi.org/10.26618/jpf.v9i1.4386

Setiyani, S., Dasilah., & Nurcahyo, D. N. (2020). Paradigma baru pendidikan era disruptif menuju masyarakat 5.0. *Prosiding Seminar Nasional Program Pascasarjana Universitas PGRI Palembang*, 747-757.

Setiyoaji, W. T., Supriana, E., Latifah, E., Purwaningsih, E., & Praptama, S. S.

(2021). The effect of learning simulation media on the students' critical thinking skills in vocational school during online learning in the covid-19 pandemic. *Jurnal Pendidikan Fisika*, 9(3), 243–252. https://doi.org/10.26618/jpf.v9i3.5681

Sirait, J., Sutrisno, L., Balta, N., & Mason, A. (2017). The development of questionnaire to investigate students' attitudes and approaches in physics problem solving. *Jurnal Pendidikan Fisika Indonesia*, *13*(2), 79–87. https://doi.org/10.15294/jpfi.v13i2.10152

Syanurdin. (2020). Pembelajaran bahasa indonesia berbasis digital dalam membina karakter siswa. *Prosiding Seminar Nasional Pendidikan Bahasa dan Sastra, 1*(1), 44-51.

Thalita, A. R., Fitriyani, A. D., & Nuryani, P. (2019). Penerapan model pembelajaran TGT untuk meningkatkan keaktifan belajar siswa kelas IV. *Jurnal Pendidikan Guru Sekolah Dasar, 4*(2). 147-156. https://doi.org/10.17509/jpgsd.v4i2.20543

Yulianti, E., & Gunawan, I. (2019). Model pembelajaran problem based learning (PBL): Efeknya terhadap pemahaman konsep dan berpikir kritis. *Indonesian Journal of Science and Mathematics Education*, *2*(3), 399–408. https://doi.org/10.24042/ijsme.v2i3.4366

Zubaidah, S. (2018). Mengenal 4C: Learning and innovation skills untuk menghadapi era revolusi industri 4.0. In *2nd Science Education National Conference*,13, 1-18.