



Comparative Analysis of the Effectiveness of Physics Learning Outcomes Against Online and Offline Learning at Public High School 1 Tikep

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Abstract

The Covid-19 pandemic has had a significant impact on education in Indonesia. From 2020 to 2021, the government requires that the learning process be carried out online. However, in early 2022 the government allowed schools in several areas to carry out offline (face-to-face) learning by implementing strict health protocols. Therefore, this study's purpose was to compare the effectiveness of physics learning outcomes against online and offline learning at Public High School (SMAN) 1 Tikep. This study uses a quantitative method approach in analyzing physics learning outcomes. The data used in this study were 116 sample data obtained from a questionnaire given to class X Natural Science (IPA) students at SMAN 1 Tikep. Based on the study's results, it was found that as many as 98% of students were happy with offline learning, while only 36% were happy with online learning. Offline physics learning is effective for student learning outcomes, while online learning is less effective. Students learning motivation in taking physics lessons offline has increased by 100%. When compared to student learning motivation in participating in online physics learning, it is only 17.24%. Based on the study results, it can be concluded that online physics learning at SMAN 1 Tikep cannot run effectively. The results of this study are expected to be used as material for evaluating the government in the distribution of education in Indonesia, especially in the procurement of Information and Communication Technology (ICT) facilities.

Keywords: SMAN 1 Tikep, physics learning, online, offline

1. Introduction

Physics is a subject that has an important role in education and technology (Trumper, 2006; Sudargini & Purwanto, 2021). However, physics subjects are difficult for students to understand and quite boring (Syahas, 2019). Physics lessons require a fairly high level of analysis, logic, systematic, and understanding. Due to these factors, most students consider physics a frightening subject, and most do not participate optimally in the given subjects (Jusriana & Budiman, 2022; Suyatna, 2019). This causes students to be unable to understand and absorb the subject matter provided. Therefore, in overcoming these problems, appropriate learning methods are needed to increase student learning interest.

Learning is an interaction between students and teachers regarding the subject matter presented (Lin et al., 2016; Putri et al., 2022). A good learning process involves active interaction between students and teachers on the subject matter. The existence of active interactions can increase interest in learning and students' understanding of the material presented (Liliana et al., 2020). The success rate of a teacher in conveying learning material can be seen from the level of student activity in the learning process and learning outcomes for each individual, where learning outcomes are indicated by the development of the level of knowledge and skills possessed by individual students. However, the Covid-19 pandemic caused the learning system in Indonesia and worldwide to experience significant changes. Due to the Covid-19 pandemic, the learning system must be implemented remotely using an online system (Sudargini & Purwanto, 2021).

The Covid-19 pandemic that has occurred since the beginning of 2020 has required all schools in Indonesia to be implemented online (in a network). The online learning system is without face-to-face meetings between teachers and students but is carried out online using an internet network. Online learning is carried out to reduce the spread rate of Covid-19. In addition, online learning is seen as a solution to the teaching and learning process. The learning process is done online using Zoom, WhatsApp, Google Meet, and Google Classroom tools. Online learning makes it easy for students and teachers to teach and learn during the Covid-19 pandemic without meeting face-to-face. However, over

time various problems have arisen in the online learning process. Problems that arise during the online learning process include the ability of students and teachers to use information technology. The learning process becomes boring. Not all students have cellphones or laptops as learning media, adequate internet availability, and various other problems.

Several studies have been conducted discussing the effectiveness of online physics learning in several schools. For example, Marisda & Ma'ruf, (2021) analyzed the effectiveness of online physics learning at SMAN 1 Pedes. Based on the results of his research, there are problems in the online learning process, where students are less enthusiastic about participating in the physics learning process and have a low ability of students to solve problems related to counting. In addition, the teacher also experienced difficulties in conveying physics equations. Based on these problems causes difficulties in applying physics equations in their application and the calculation process is less effective. Putri et al. (2022) in her research, analyzed the effectiveness of using physics learning media in delivering subject matter to improving student learning outcomes. The results of the study showed that there was an increase in students' motivation for using Google Classroom and Zoom media. The media influence this for delivering learning material that can be more interesting so that the learning process can run effectively and efficiently. Renata & Jana, (2012) analyzed the effectiveness of using E-Learning in the physics learning process with the research location used being located at State Madrasah Aliyah (MAN) 1 Takengon. Based on the results of his research, shows that there are several problems in the implementation of E-Learning learning, namely that there are several teachers who are not yet able to use E-Learning, learning materials and methods are less attractive, and the availability of internet access is not optimal.

The government through the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) has permitted face-to-face learning (PTM) for several regions in Indonesia in 2022. PTM (offline) activities in schools are carried out by implementing the Covid-19 health protocol. The offline learning program is a process of teaching and learning to be carried out again in schools, it's just limited by the rules that apply so that the practice cannot return to normal as before. Based on the description of the problems above and the existing conditions, this study aims to analyze the effectiveness of glasses learning outcomes for online and offline learning at SMAN 1 Tikep. The results of this study are expected to provide knowledge of student learning outcomes in the physics learning process in a bold and attractive way. It is hoped that this can be used as evaluation material for teachers and the government in making learning program policies more effective during the Covid-19 pandemic.

2. Materials and Methods

2.1. Materials

The data used in this study are primary data obtained from a questionnaire or questionnaire. The questionnaire given to the students was in the form of a list containing questions with a number of answers given by the respondents. Questions were asked about the program and physics learning outcomes both online and offline (face-to-face) and given to class X IPA students. In addition to the questionnaire given, the interview process was conducted with students to obtain research-supporting data. The location chosen in this study was SMAN 1 Tikep, located in West Muna Regency, Southeast Sulawesi Province. The choice of class X IPA was because in semester 1 teaching and learning activities were carried out online, while in semester 2 learning activities were carried out offline or face to face. In SMAN 1 Tikep school for class X Science there are 116 students who must be divided into four classes consisting of 28 students X Science 1, X Science 2 29 students, X Science 3 31 students, and X Science 4 28 students. In this study, data collection was carried out by making the entire study population the sample used. So that the data used in this study were 116 sample data. Furthermore, the sample data obtained from the questionnaire provided is analyzed to find out which comparisons of online and offline learning are more effective, accompanied by supporting reasons.

2.2. Methods

This study uses a quantitative method approach in analyzing the results of learning physics. Qualitative research is a type of research whose findings are not obtained through statistical procedures or other forms of calculation. The findings originate from the results of understanding and interpreting the meaning of an interaction event of human behavior in certain situations according to the researcher's own perspective. Qualitative research is descriptive in nature and tends to use analysis, where supporting theory is used as a reference so that the research results are in accordance with the facts on the ground (Mohajan, 2018).

3. Results and Discussion

In an effort to prevent the spread of Covid-19, the government issued a policy that requires schools to conduct learning activities online. This is in accordance with Circular No. 4 of 2020 which regulates the learning process during the Covid-19 pandemic. Where the circular letter, for all educational institutions to carry out teaching and learning activities online or remotely. Online learning is carried out using electronic media that is connected via the

internet as a means of communication media for the teaching process between teachers and students. However, the government through the Ministry of Education and Culture will allow offline or face-to-face learning for several regions in Indonesia in 2022. Offline learning has been implemented for all schools in West Muna Regency by implementing the health protocol. Many students at SMAN 1 Tikep welcome and feel happy with offline learning, especially in physics. Where, physics subjects are difficult to understand, especially for solving physics equations when explained online. Based on the results of interviews with several students, many compared online and offline learning systems. Where most students support offline learning rather than online learning. Based on the questionnaire given to 116 students, the majority of students were happy with offline learning. More complete results regarding the comparison of the level of enjoyment of students with the online and offline learning process are given in Figure 1 and Figure 2 as follows:

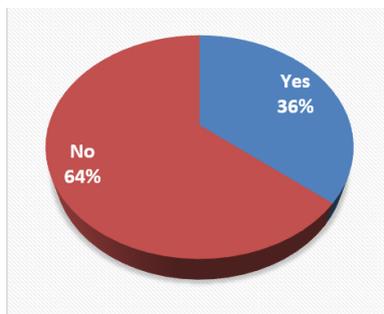


Figure 1: The level of enjoyment of students while participating in online learning

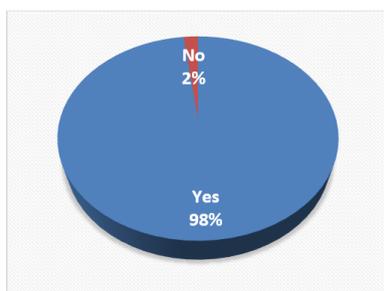


Figure 2: The level of enjoyment of students while participating in offline learning

Looking at the results of the diagrams in Figure 1 and Figure 2, it can be seen that the majority of students like Offline learning activities with a 98% pleasure level presentation. However, for learning that was carried out in semester 1 online, the average student did not like it with 36% liking online learning, while 64% did not like online learning. Based on the results of interviews with several students, they said that they liked offline (face-to-face) learning because they could meet classmates, whereas at the beginning of school, they could not meet face-to-face, and introductions were made online. In addition, the majority of students answered that the learning process was boring and they did not understand the learning material delivered by the teacher. The results of learning physics in class X IPA on the online learning process (in semester 1), and the offline learning process (in semester 2) at SMAN 1 Tikep determined the level of effectiveness of students in the learning process. Based on the results of the analysis of the questionnaire data obtained, the majority felt that there had been an increase in student learning outcomes during offline learning when compared to the online learning process. A comparison of online and offline learning outcomes to physics learning outcomes is shown in Table 1 as follows:

Table 1: Comparison of Online and Offline Learning on Physics Learning Outcomes

Physics Learning Outcomes	Respondents Student Learning Outcomes			
	Online		Offline	
	Yes	No	Yes	No
The material delivered during physics learning runs effectively	33.62%	66.38%	100%	0%
The material provided by the teacher during the teaching and learning process is easily understood by students	25.86%	74.14%	98.28%	1.72%
The assignments given by the teacher are easily understood and completed by students	24.14%	75.86%	94.83%	5.17%
Student motivation in participating in physics lessons has increased	17.24%	82.76%	100%	0%

Based on the research results in Table 1, it can be seen that there is a big difference in the physics learning process that is carried out online when compared to offline learning. The physics learning system offline is much more effective when compared to online learning. When viewed from the material delivered online, it is less effective, where as many as 66.38% of students think it is ineffective. This was influenced by communication in conveying material through WhatsApp (WA) media in videos related to subject matter topics and physics textbooks sent through each class group. Based on these conditions, the material delivered by the teacher is not optimal. Based on Table 1, as many as 74.14% of students said that the material presented did not run optimally and was easy to understand. Based on the interview results, most said that students are required to study independently during online learning. During online learning, the material delivered by the teacher feels short, and there is no interaction between the teacher and students. The selection of WA media as a learning tool is influenced by the inadequate quality of the internet network, and not all students have mobile phones (HP). Therefore, to increase students' understanding of the material presented, the teacher gives assignments at each meeting in the hope that students can learn independently. However, the task given by the teacher was not effective. This is shown by the results of the analysis in Table 1. The assignments given could be understood and carried out by students as much as 24.14% of the time, while 75.86% of the tasks given could not be understood and carried out by students. The biggest problem in completing the assigned tasks is solving physics equations and calculation problems. The assignments given by the teacher could not be carried out because there were no group mates in direct discussions and the lack of interaction between the teacher and students.

The offline physics learning system works effectively on student learning outcomes. Based on the results in Table 1, it can be seen that the material delivered during physics learning runs 100%. This is because the material provided can be obtained directly in the classroom. Furthermore, the material provided by the teacher during the teaching and learning process is easily understood by students, with a student understanding level of 98.28%. Material delivered face-to-face (offline) is easy for students to understand, and there is direct interaction between the teacher and students if there is the material that is not understood by students. The long time during the teaching and learning process makes it easier for students to understand the material presented by the teacher. In addition, the tasks given by the teacher can be understood and carried out by students. The assignments given can be done because students can form their own groups in discussing and solving questions from the assignments given. Based on the results of the research, shows that students' learning motivation in taking physics lessons offline has increased by 100%. When compared to student learning motivation in participating in online physics learning, it is only 17.24%. Significant differences in student learning motivation towards online and offline learning are affected because they are not used to independent learning. In addition, conditions are inadequate for holding online learning at SMAN 1 Tikep, such as an inadequate internet network, the availability of cell phones for each student, and the ability to use Information Technology (IT).

4. Conclusion

Based on the results of the study, it can be concluded that online physics learning cannot run effectively. This is influenced by the quality of the internet network which is not good, not all students have communication media in the form of cell phones or laptops, and students' lack of ability to use Information Technology (IT). Based on the study's results, it was found that as many as 98% of students were happy with offline learning, while only 36% were happy with online learning. In addition, there is a significant difference in the results of learning physics between online and offline learning. Offline physics learning is effective for student learning outcomes, while online learning is less effective. In other circumstances, students' learning motivation in taking physics lessons offline has increased by 100%. When compared to student learning motivation in participating in online physics learning, it is only 17.24%.

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