THE EFFECT OF BLENDED LEARNING USING SCHOOLOGY TOWARD STUDENT LEARNING OUTCOMES ON WORK AND ENERGY TOPIC IN SMAN 1 PERBAUNGAN

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Abstract *This research aims to determine the effect of blended learning using schoology toward student learning outcomes on work and energy topic at grade X MIA in SMAN 1 Perbaungan. This type of research is quasi-experimental. The population in this research were all students of class X MIA in SMAN 1 Perbaungan which consisted of 4 classes. The sample selection was purposive sampling where class X MIA 1 as the experimental class and X MIA 2 as the control class. The results of the average value of the experimental class pretest 46.97 and the control class 45.9 both samples were normally distributed and homogeneous. Based on the two tail t-test analysis obtained the initial ability of the two samples is the same. After that, different treatments were given in both classes and posttest was performed, the results of the experimental class average score was 78.67 and the control class was 63.67. One tail t-test analysis was obtained that there was an effect of blended learning using schoology toward student learning outcomes on work and energy topic at grade X MIA in SMAN 1 Perbaungan.*

Introduction

Education is an effort to form human resources that can improve the quality of life. Sukmadinata (2012) education is an activity to optimize the development of potential, skills and personal characteristics of students. Education can also be interpreted as the spearhead in preparing reliable human resources because education can encourage and maximize the potential of students as reliable human resources to be able to solve problems faced.

One of the problems faced by the world of education is the problem of the weak learning process. In the learning process in the classroom, students lack the motivation to develop thinking skills, student's brains are forced to remember and hoard a variety of information without being required to understand information and connect it to everyday life so that their thinking stops until learning is over. One way to improve education in Indonesia is to make improvements in the learning process, so efforts need to be made in improving learning along with the times that require students to be knowledgeable.

The main purpose of the learning process is to achieve goals for the success of students in learning, both in a particular subject and education in general. In an effort to realize the function of education as a vehicle for human resources, it is necessary to develop a constructive learning process for the development of students' creative potential along with the development of atmosphere, habits, and learning strategies based on the understanding of the sciences and their implications for teaching and learning activities for the teachers at the school.

Physics is a very important branch of science. Physics is a science that uses scientific methods in the process that train each student in observing, hypothesizing, experimenting, and thinking scientifically. Because of the importance of physics, students are expected to be able to accept physics learning in class and develop or apply ideas, information, and concepts they have.

However, in reality, if observed directly in the field it shows that student only memorize the concepts that have been conveyed by the teacher so that if they have met with problems related to real life, students are not able to apply the concept. So, make the

student learning outcomes less satisfying because they cannot apply the concept of physics in everyday life. This is due to the lack of learning innovations from teachers that make students feel bored and lack enthusiasm for learning so that physics learning becomes less meaningful.

Based on the results of interviews conducted by researchers at SMAN 1 Perbaungan by conducting interviews with one of the physics teachers, showed that student learning outcomes were still low and still below the Minimum Satisfaction Criteria (KKM) is 75, because teachers who used learning models less varied, the teachers use cooperative learning models, but the implementation is not in accordance with the syntax of cooperative learning or still conventional and teacher- centered and uses the lecture method in delivering material and giving assignments.

Based on the results of the questionnaire distributed to 30 students, 56.7% (17 students) argued physics was a difficult and less interesting lesson, 63.3% (19 students) argued that the value of the test was quite satisfactory (60-75), 100% (30 students) argued that the teacher had never used supporting media in learning, such as power points, learning videos and others, 50% (15 students) argued that they preferred to study on their own rather than discuss with friends, and 100% (30 students) think that they already have an Android and use it when they have difficulty learning physics.

At present information and communication technology (ICT) is needed in every aspect of life. Almost everyday we use ICT in everyday life. Information Technology is a technology used to manage data, including processing, obtaining, compiling, storing, manipulating data in various ways and producing high-quality and valuable information. Through the use of ICT, we can improve the quality of education, namely by opening wide-open access to science and the provision of quality education. The Information and Communication Technology System provides a broad, fast, effective and efficient range of information dissemination to various parts of the world.

Information technology develops in line with the development of theory and communication and technology that supports learning practices. The development of information technology that is increasingly rapid in this era of globalization is inevitable the effect on the world of education. Global demands the world of education to always adjust technological developments towards efforts to improve the quality of education, especially adjusting the use of Information and Communication Technology to the world of education, especially in the learning process.

One of the facilities of the technology that can be used for learning is electronic learning or e-learning. *E-Learning* is learning that the media used to deliver materials to the students by utilizing information and communication technologies. By using e-learning, students can learn independently with the use of e-learning as a medium of learning so that students become the center of activity in the learning. Learning using e-learning to students demanding more independent in their learning, thus learning with e-learning can increase the activity of the students. E-Learning can be used to overcome the limitations of educators with learners, especially in terms of time. Through these e-learning educators and learners can perform learning anytime and anywhere as long as connected with the internet.

There is no obligation for students to access e-learning material. Even though it is optional, students who use it will certainly have additional knowledge or insight. Pertiwi, (2013), in his study explained one thing that needs to be emphasized and understood is that e-learning cannot completely replace conventional learning material. Even though it is optional, students who use it will certainly have additional knowledge or insight.

Pertiwi, (2013), in his study explained one thing that needs to be emphasized and understood is that e-learning cannot completely replace conventional learning activities in the classroom. E-Learning can be a partner or complementary with conventional learning in the classroom. E-Learning is even a great complement to classroom learning

models or as a powerful tool for enrichment programs.

At present, there is a learning model that combines traditional learning (conventional) with electronic learning or e-learning, blended learning which uses internet networks where there is web-based learning. Dermawan (2014) "Blended learning is a combination of various learning models aimed at optimizing learning processes and services both long-distance, traditional, media, and even computer-based."

One technology facility with e-learning that is widely used in physics learning is Schoology. Schoology is a type of web-based social network that has features with a variety of learning tools that are done in the real world, ranging from checking attendance, tests, quizzes, to student task collection (Amiroh, 2013). Schoology allows the collaboration of various individual, group, and class discussion data so that schoology is very suitable to be used as a supporting learning media using e-learning. With the features possessed by schoology, schoology can be a solution to the problems experienced by students in learning physics.

The role of teachers in building a culture of learning through schoology is very important. The motivation of each student to express his ideas through the schoology media is inseparable from the support of the teacher as a teacher. The teacher can also direct students in discussion forums and comments about the material or writing that has been made by their students. Besides, the teacher can also convey material or assignments through schoology to facilitate the dissemination of information.

The use of media schoology in physics learning must be supported by the availability of media such as computers or mobile phones and especially the internet. Based on observations made by researchers while in SMAN 1 Perbaungan, the use of technology by students in the form of an Android mobile phone is no longer familiar there. So, it makes easier for students to access schoology.

Besides, the use of media schoology in learning is also supported by wifi that has been available in SMAN 1 Perbaungan. The facts can be utilized by the teacher in creating a more quality and meaningful learning process in the classroom by applying media schoology in learning physics.

Method of Research

This research was conducted in SMAN 1 Perbaungan Jl. Mayjend H.T. Rizal Nurdin Perbaungan, Ujung Rambung, Pantai Cermin, Serdang Bedagai Regency, North Sumatra.

Taking and determining the sample class in this study was taken by purposive sampling technique. Where this research held in classes that have relatively similar capabilities. According to observations in this study, the samples taken were class X MIA 1 and X MIA 2 SMAN 1 Perbaungan. Where class X MIA 1 as the experimental class and class X MIA 2 as the control class.

The research design was a nonequivalent control group design. The study involved two classes of samples given different treatments. This study requires an experimental class and a control class, but it is not possible to randomly take research subjects from the existing population. Where the experimental and control class are not randomly selected. The diagram of the research design can be seen in Figure 1.

$$
\begin{array}{ccc}
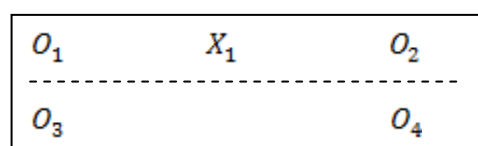O_1 & X_1 & O_2 \\
\hline
O_3 & & O_4
\end{array}
$$

Figure 1. diagram of the research design

In this study, there were experimental classes and control classes, which were chosen randomly. In this study the two classes did not get the same treatment, namely in the control class conventional learning would be given only, while in the experimental class blended learning would be given which combines conventional learning and online learning using schoology.

Where in the first and second meetings will be given online learning using schoology and the third and fourth meetings will be given conventional learning. Before being given learning first students are asked to do the pretest problem after that at the end of the

lesson students are given the posttest question. The difference in learning outcomes between experimental and control classes is used as an indicator of student learning success using blended learning using schoology in learning.

Result and Discussion

The study was conducted in SMAN 1 Perbaungan. Which one the purpose of this study is to determine whether there is an effect of blended learning using schoology toward student learning outcomes on work and energy topic at grade X MIA in SMAN 1 Perbaungan. This study is a quasi-experiment study involving two classes given different treatments, namely the experiment class was treated blended learning using schoology and the control class was treated using conventional learning. The study was conducted in two classes consisting of an experimental class with 30 persons and a control class with 30 persons.

The initial ability test (pre-test) was given to both sample classes before the two sample classes were given different treatments. Give the pre-test aims to determine the initial ability of students in the sample class. The data from the pre-test of the experiment class and the control class are listed in the form of a frequency distribution table in the following table 1 below:

Table 1. Data of pre-test for Experiment and Control Class

No	Experiment Class		Control Class	
	Value	f	Value	F
1	20 – 27	4	20 – 27	2
2	28 – 35	3	28 – 35	5
3	36 – 43	6	36 – 43	6
4	44 – 51	5	44 – 51	7
5	52 – 59	5	52 – 59	4
6	60 – 67	4	60 – 67	6
7	68 – 75	3	68 – 75	0
	Total	30		30
	Average	46.97		45.9
	Standard Deviation	14.99		12.49

Both classes were given different treatments, the experiment class with blended learning using schoology and the control class

using conventional learning, then the two classes were given post-test with the same questions as the pre-test. The results of the posttest experimental class and control class are listed in the form of a frequency distribution table in table 2 below:

Table 2. Data of Pre-Test for Experiment and Control Class

No	Experiment Class		Control Class	
	Value	f	Value	f
1	60 – 64	2	50 – 54	8
2	65 – 69	3	55 – 59	4
3	70 – 74	5	60 – 64	5
4	75 – 79	6	65 – 69	5
5	80 – 84	5	70 – 74	2
6	85 – 89	5	75 – 79	3
7	90 – 94	4	80 – 84	3
	Total	30		30
	Average	78.67		63.67
	Standard Deviation	8.93		10.19

The study was conducted at SMA N 1 Perbaungan by using two classes as a research sample, where each sample will be given a different treatment. In the experimental class with blended learning using schoology, and the control class using conventional learning. The study began by giving a pre-test to the two sample classes with the number of multiple choice questions 20 items. The results showed that the average student learning outcomes experienced an increase after being given treatment. The average student learning outcomes of the experiment class are higher than the average learning outcomes of the control class students, this shows that there is a significa nt effect between student learning outcomes using blended learning with conventional learning on work and energy material.

The results of the experiment class pre-test obtained an average value of 46.97 and the average value of the control class was 45.9. Furthermore, the experiment class and the control class were given different treatments. After the two classes were treated, each class was given a posttest to see the difference due to being given different treatments. From the post-

test data of the two classes, the average post-test values for the experiment class were 78.67 and the mean of the control class 63.67. So, learning outcomes in the experimental class are higher than in the control class.

Based on the comparison of the average value of the pre-test of the experimentalclass and the control class, it appears that the values obtained by the two classes are not very different. This difference shows that the initial abilities of both classes are normal and homogeneous. While the comparison of the average posttest values of the experimental class and the control class showed significant differences, this indicates a significant effect of blended learning using schoology. The results of the normality and homogeneity tes for both samples showed that the pretest and posttest.

values were normally distributed where $L_{count} < L_{table}$ and originated from a homogeneous population. Hypothesis test results for posttest using the *t*-test at a significant level $\alpha = 0.05$ obtained $t_{count} > t_{table} = 6.04 > 1.67$ which means that there are differences due to the effect of blended learning using schoology toward student learning outcomes on work and energy topic in SMAN 1 Perbaungan.

The results of this study are supported by several data from previous research, including: In the research of Izuddin (2012) said that the learning outcomes of students given blended learning were better than those who were not given treatment. Where through learning using blended learning, the learning process will be more effective because the usual teaching and learning process (conventional) will be assisted by e-learning learning which in this case stands on information technology infrastructure and can be done anytime and anywhere. In addition, according to Jusoff (2009) blended learning not only reduces the distance between students and teachers but also increases interaction between the two parties. In the research of Hermawanto (2013) said that with blended learning the mastery of students' concepts is better, it can be seen from the mastery of concepts in the experimental class is higher than the mastery of the concept

of the control class, because the information that students get further than the information provided by the teacher and in various forms and always up to date.

Bawaneh (2011) states that blended learning can improve student performance. This can be seen from the increasing number of students online in learning, as well as conducting online discussions. In blended learning, this is combined with face-to-face and e-learning methods that can involve students actively and allow students to get feedback as in the assignments given by the teacher. The teacher then uploads the results of the assignments after the task deadline ends, students who work on the quiz receive feedback in the form of results responses. Learners can obtain information from various forms so that new knowledge will be obtained. And supported by research by Purwaningsih (2017) said that there were significant differences between blended learning and conventional learning.

The difference in student learning outcomes is caused by the use of schoology as a learning media. Where in SMAN 1 Perbaungan already uses the 2013 curriculum but in its implementation, it still applies traditional learning where all are centered on the teacher (teacher center), this results in students not having the intention of learning and feeling bored because the teacher does not use any model or media in the learning process. Although in SMAN 1 Perbaungan already equipped with wifi, LCD facilities, and some teachers already have laptops, and where students have been allowed to bring phones to school, but teachers do not use the facilities that are already available properly.

In addition to increasing the use of wifi and android in students in SMAN 1 Perbaungan where the 2013 curriculum integrates ICT on all subjects and where the lack of available time strongly supports the existence of blended learning using schoology. Where schoology has many advantages, including schoology has many features of learning tools such as attendance checking, tests, quizzes, online discussion rooms, student grades list, and student assignment collection.

So that, the use of schoology can help teachers in the learning process so students do not feel bored while studying physics. Where students can freely access information from Youtube, Google, websites, etc. to add information about the material to be discussed, and discuss it with their group friends

Based on the results of the study revealed that the use of schoology is very effective and influential on student learning outcomes because the use of e-learning with schoology is able to help students in finding the information needed using Android without having to focus on what is delivered by the teacher.

Unlike learning in the control class that uses conventional learning. Students are placed as learning objects that act as recipients of information passively, students learn more by receiving, taking notes, and memorizing lesson material. In other words, in the experiment class students are the

The teacher basically directs, helps students find information and acts as one source of learning so students can play a more active role. In the control class, the teacher is the giver of information while students are passive recipients of the information. Learning is only teacher-centered so it tends to be a determinant of the course of the learning process.

At the time of the research, researchers found several difficulties faced, namely: (1). At the time of making student accounts on schoology takes a very long time because many students forget their passwords and gmail, so students must create a gmail account and can only register. (2). In completing the quiz questions on schoology, many students are too long to answer these questions without looking at the duration of time that has been provided, making students repeat again. (3). There aresome students who are ashamed to ask questions and opinions both in the discussion room in schoology and directly. (3). There are some students who only see the contents of the material, videos on schoology but don't want to discuss with group friends.

Conclusion and Suggestion

Based on the results of data analysis and hypothesis testing, it was concluded that: Student learning outcomes taught blended learning using schoology on work and energy topic in SMAN 1 Perbaungan is 78.67. While student learning outcomes taught using conventional learning on work and energy topic in SMAN 1 Perbaungan is 63.67. Student learning activities taught with blended learning using schoology on work and energy topic at grade X MIA in SMAN 1 Perbaungan obtained average student learning activities in the first meeting (online learning) 59.33 and at the second meeting (online learning) the average student learning activities increased to 79.67 at the third meeting (conventional learning) the average student learning activity decreased to 64.33 and at the fourth meeting (conventional learning) the average student learning activities increased to 67.33. There is a significant effect of blended learning using schoology toward student learning outcomes on work and energy topic in SMAN 1 Perbaungan.

Based on the results of the research and conclusions stated, for the follow-up of this research, the researcher has the following suggestions: For further researchers who want to apply blended learning using schoology, time management is needed so that each stage in blended learning can be carried out well. Both in making practice questions, assignments, and material that will be uploaded on schoology. For further researchers who want to research blended learning using schoology, it would be better if you use more than one observer to better observe the required research. For further researchers who want to use blended learning to better understand each stage of the blended learning process so that learning is more effective.

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