THE INFLUENCE OF WORKSHEET BASED E-LEARNING TOWARD MATHEMATICS LEARNING OUTCOMES IN CLASS X IN SMK MUHAMMADIYAH MAJENANG CILACAP

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ABSTRACT

This research was conducted on the ground of the learnings are applied during this tends to be teacher's centered, many students who are less active, less enthusiastic in learning process. Therefore, it needs a learning model that involves many students makes a student more active. This research aims to determine the Influence Of worksheet based e-learning Toward Mathematics Learning Outcomes Of Student Grade X at SMK Muhammadiyah Majenang Cilacap Of Even Semester in Academic Year 2015/2016. The populations in this research were students of class X RPL SMK Muhammadiyah Majenang. Samples were taken using random sampling techniques derived from class X RPL 3 as an experimental class and class X RPL 1 as the control class. The data collection method used was the test method. Testing instrument using validity test, remainder test, and reliability test. Data were analyzed using a prerequisite analysis test including normality test using Chi-Square formula, homogeneity test by test Bartlett, and hypothesis test with t-test. Based on calculations at the significant level $\alpha = 5\%$ and 58 degrees of freedom, we conclude that : (1) there is a different result of math study that using *worksheet based e-learning* and conventional. This is indicated by the result of the first test of the hypothesis that $t_{count} = 2.345 > t_{table} = 2.000$ (2)learning using worksheet based e-learning is more effective than learning using conventional worksheet. It is shown on the second test of the hypothesis that the test result $t_{count} = 2.345 > t_{table} = 1.670$.

Keywords: Influence, *worksheet based e-learning*, Mathematics Learning Outcomes.

INTRODUCTION

The XXI century is known as the age of globalization and the age of information technology. Very fast and dynamic changes in this field are facts of student life. The development of increasingly advanced technology will bring influence to other fields, one of which is in the field of education. Education as an effort to realize quality human resources and require a supporter, namely tips in improving the quality of education. Special attention is directed towards the development and progress of education in order to improve the quality and quality of education. Therefore, the government is trying hard to innovate in the field of education, both curriculum, institutions, facilities, and infrastructure, as well as an increase in teaching staff. In connection with this formal education is one vehicle in building quality human resources. Efforts to improve the quality of human resources is one way to improve the quality of education. In general, in the school environment, educators in certain fields of study are required to master the previous subject because the next subject depends on the previous subject so that it is easier for students to master other subjects that are interrelated with the subject.

In reality, students have a great interest in certain subjects, but mathematics is a subject that is rarely sought after for certain reasons, so mathematics is seen as scary even more frightening if the teacher has students who are not sympathetic and frightening to their students. The way the teacher teaches mathematics that is not in accordance with the way of thinking students cause difficulties among students. So that teachers and mentors are emphasized so that every field of study in the overall guidance of child development and achievement.

Basically learning is a process of communication between teacher and student. The communication process that occurs does not always run smoothly, even the communication process can lead to misunderstandings or misconceptions. For this reason, teachers must be able to provide alternative learning for their students in order to understand the concepts that have been taught.

The assumption of some students states that mathematics is difficult, difficulties are caused because mathematical objects are mind-objects that are abstract. Therefore many exercises are needed. With this practice, it is hoped that his achievements will increase, the reality in the field of some students experiencing difficulty learning mathematics. This can be seen from the results of semester tests from year to year, in general, are still low. Indicators of low mathematics scores in semester tests can be seen in Table 1 below.

Table 1. Summary of Middle Deuteronomy Mathematics Semester Class X RPL Vocational School Muhammadiyah Majenang Vocational Year 2015/2016

	KKM mathematics	**Class**					**Percent**
		XRPL 1	**XRPL 2**	**XRPL 3**	**XRPL 4**	**XRPL 5**	
Complete	75	1	1	1	1	0	2.548 %
Not complete		29	29	29	32	34	97.452 %
Total		30	30	30	33	34	157

Source: Kurikulum SMK Muh. Majenang

To overcome this problem can be done either by the government through training and infrastructure, but the results are also not satisfactory. Factors influencing learning difficulties include internal factors (physical and spiritual conditions such as students such as motivation, interests, and health) and external factors (environmental conditions around students such as weather, class atmosphere, and teacher teaching methods).

Along with the rapid development of science and technology, a learning model has emerged that utilizes information and communication technology in learning called electronic learning (e-learning). E-learning system is a form of learning implementation that utilizes information technology that has great potential to improve the quality of learning, especially in learning mathematics. Many abstract and imaginative things that are difficult for students to think about, can be presented through computer simulations. Mathematical explorative exercises and experiments can be done by students using simple programs for planting and strengthening concepts, making mathematical modeling, and developing strategies in solving problems. The internet is a program that utilizes computer media. The use of the internet in the world of education offers various facilities and beneficial results for students and teachers alike.

Based on the results of observations and class observations, the students of SMK Muhammadiyah Majenang class X RPL (Software Engineering) tend to be more lazy in following normative subjects such as Mathematics and Natural Sciences (Mathematics and Natural Sciences) and language fields. The majority of students think normative subjects, especially mathematics, are considered boring and saturating in terms of subject delivery and learning. So that most students do not understand the material delivered by the teachers, as a result, students are indifferent in these subjects by sleeping in class or playing their cellphones. The data in Table 1.1 completeness of the end of the semester X RPL test shows that 97.452% of students did not complete math subjects with minimum completeness criteria (KKM) with number 75. KKM mathematics subjects at SMK Muhammadiyah Majenang can be seen in Appendix 7.6. Many students reach KKM only 2.548% in mathematics. From these results, it can be identified that mathematics subjects are seen as subjects that cause fear so learning outcomes tend to be lower than other subjects.

In the mathematics class, actually, the mathematics teacher has applied the use of student worksheets (LKS) in almost every meeting. However, student worksheets (LKS) distributed to students still found many shortcomings such as writing material prepared by subject teachers is limited and not detailed so that many students do not understand, the lack of diversity of sample questions, and the limited sheets of paper distributed. This causes student worksheets (LKS) to be less optimal in their use so that it affects the learning outcomes of students.

The application of the website as a learning medium in learning activities in class X SMK Muhammadiyah Majenang is able to streamline and streamline learning activities. With effective and efficient learning activities, it is expected that the use of a website-based worksheet can make learning done successfully, this success can be seen from the completeness of student learning outcomes. The use of the website as a delivery of student worksheets is because the website has a wide network and will provide wider opportunities and will provide wider opportunities for students to choose the time, place, and get more information about the material being studied.

SMK Muhammadiyah Majenang already has a learning-based learning resource facility that has been integrated by the school website so that it is more effective and efficient in its use. Mathematics learning in classrooms has been applied such as the use of learning CDs and material exposure with computer software, where the results obtained are classified as good. However, the use of the internet as a source or medium of learning is still not optimally utilized by subject teachers both in general and vocational fields. The school also has an internal hotspot (internet network) so teachers and students can use the internet for free. In general, the majority of students of SMK Muhammadiyah Majenang enjoy surfing the internet both in use with their Personal Computer (PC) media and smartphone gadgets.

From the aforementioned background description, the compiler was motivated to conduct a study entitled "The Effect of Using E-learning Based Student Worksheets on Mathematics Learning Outcomes of Class X Even Semester of SMK Muhammadiyah Majenang Cilacap Regency 2015/2015 Academic Year."

Based on the background of the problem, then the problem can be formulated to be examined as follows: Is there a difference in mathematics learning outcomes between students who use e-learning based student worksheets and students who use conventional student worksheets in class X students even semester at SMK Muhammadiyah Majenang Cilacap Regency 2015/2016 Academic Year? Which is better, student learning outcomes using Student Worksheets (LKS) based on e-learning with those using conventional Student Worksheets (LKS) in class X students even semester at SMK Muhammadiyah Majenang Cilacap Regency 2015/2015 Academic Year?

In connection with the problem formulation that has been described, the objectives of this research are:

1. To find out the differences in mathematics learning outcomes between students who use e-learning based student worksheets and students who use conventional student worksheets in class X students even semester at SMK Muhammadiyah Majenang Cilacap Regency 2015/2016 Academic Year.
2. To find out which one is better, mathematics learning outcomes between students who use e-learning-based Student Worksheets and students who use conventional Student Worksheets (LKS) on even semester X class students at SMK Muhammadiyah Majenang, Cilacap Regency, Year 2015/2016 Teachings.

METHODS

This research is classified as quantitative research. This type of research is experimental research. The experimental design model used is the pretest-posttest group. both the experimental and control groups received treatment X, so the design structure is as follows.

Table 2. structure of research design

Group	Pretest	Treatment	Postest
Experimental class (A)	Y_1	X_1	Y_{12}
Control class (B)	Y_2	X_2	Y_{22}

This research was conducted by SMK Muhammadiyah Majenang Cilacap Regency conducted in the even semester of the academic year 2015/2016

According to Arifin, Z (2012: 215) Population is the whole object studied, both in the form of objects, events, values and things that happen. The population referred to in this study is class X students

majoring in RPL (Software Engineering) SMK Muhammadiyah Majenang Cilacap district in the academic year 2015/2016 which is divided into 5 classes namely X RPL1, X RPL2, X RPL3, X RPL4, and X RPL5. All classes are homogeneous because they are arranged randomly.

According to Arifin, Z (2012: 215) "The sample is a portion of the population to be investigated". In this study samples were taken at random, using random sampling techniques to the class. Sampling is done by lottery class, without regard to strata. Because the population is considered to have the same ability. obtained X class RPL3 with 30 students as the experimental class, class X RPL1 with 30 students used as the control class and class X RPL 2 with 30 students as the pilot class.

The types of variables used in this study are the learning approach and mathematics learning outcomes. The research method is the method used by researchers in gathering research. Variations of the methods referred to are questionnaires, interviews, observations or observations, tests and documentation (Arikunto, S, 2010: 203). In this study, research methods in the form of documentation and tests were chosen.

According to Arikunto, S (2010: 201) Documents mean written goods. In investigating written objects such as books, magazines, documents, regulations, minutes of meetings, diaries, and so on. Understanding documentation is a data collection technique based on documents, namely by collecting data on written documents on the object of research. This documentation method is used to obtain data about the students' initial abilities in learning mathematics before the experiment is carried out. While Understanding the test according to Arikunto, S (2013: 67) The test is a tool or procedure used to find out or measure something in the atmosphere, by means of rules that have been determined. The instrument used in this study was the document on the results of students' final semester exam results and post-test questions.

Analysis of the data used in this study was a prerequisite test consisting of a normality test using the Chi-Squared formula, a homogeneity test with a Bartlett test, and a hypothesis test with a t-test. The first hypothesis test is used to find out the hypothesis that there is a significant difference between student mathematics learning outcomes using LKS based on e-learning and conventional LKS. The second hypothesis test used for worksheets based on e-learning is better than using conventional worksheet.

RESULTS AND DISCUSSION

Based on the research that has been carried out obtained data in the form of initial abilities and student learning outcomes.

1. Initial Ability

The initial ability scores were obtained from the results of the pretest grades of class VIII A and VIII G from the results of tests conducted by mathematics teachers in class VIII SMP N 2 Pleret. A summary of the initial mathematical ability scores of the experimental class and the control class can be seen in Table 2.

Table 2. Summary Descriptions of Initial Ability Values

Class	Experimentation Class (X RPL 3)	Control class (X RPL 1)
The highest score	65	70
Lowest Value	25	30
Average	45,333	42,000
S	9,643	11,492
S^2	92,989	132,069
Lots of data	30	30

Source: Kurikulum SMK Muh Majenang

The normality test is used to find out whether or not the normal distribution of the initial ability of each experimental class and dick data. Researchers performed 2 times the normality test calculation, namely the normality test for the experimental class and for the control class. The summary of the results of the initial ability normality test can be seen in Table 3.

Table 3. Summary of Initial Ability Normality Test Results

Variable	Experimentation Class (X RPL 3)	Control class (X RPL 1)
x^2	1.368	6.342
(α)	5%	5%
Dk (k-1)	3	3
$\chi^2{}_{table}$	7.815	7.815
Testing criteria	Samples are normally distributed if $\chi^2{}_{count} \leq \chi^2{}_{table}$	
Information	NORMAL	NORMAL

From the normality test, the significance level is 5% and the degree of freedom = 3, it can be seen that $\chi^2{}_{count} = 1.368$ and $\chi^2{}_{table} = 7.815$ so $\chi^2{}_{count} < \chi^2{}_{table}$, which means that the initial ability scores of the experimental class students were normally distributed. In the control class of 5% significance level and degree of freedom = 3, it can be seen that $\chi^2{}_{count} = 6.342$ dan $\chi^2{}_{table} = 7.815$, which means the value of the initial ability to control class students is normally distributed.

The homogeneity test on learning outcome data is intended to investigate whether all samples in the population have the same variance or not. Researchers performed homogeneity test calculations 2 times, namely the homogeneity test for the experimental class and for the control class. The summary of the results of the initial ability normality test can be seen in Table 4.

Table 4. Summary of Initial Ability Homogeneity Test Results

Variable	Experimentation Class (X RPL 3)	Control class (X RPL 1)
S_1^2	92.989	132.069
$\chi^2{}_{count}$	0.888	
$\chi^2{}_{table}$	3.481	
(α)	5%	5%
Df (k-1)	29	29
Testing criteria	Samples are normally distributed if $\chi^2{}_{count} \leq \chi^2{}_{table}$	
Information	HOMOGENEOUS	

From the homogeneity test at a significant level of 5% degrees of freedom = 2, it can be seen that $\chi^2{}_{count} = 0.888$ and $\chi^2{}_{table} = 3.481$, so $\chi^2{}_{count} < \chi^2{}_{table}$, which means that both classes have the same variance (homogeneous).

The summary of the initial ability similarity hypothesis test values can be seen in Table 5.

Table 5. Summary of Initial Ability Hypothesis Test Results

t_{count}	t_{table}	α	df	Information
1.217	2.000	5%	58	H_o received H_1 rejected

From the similarity hypothesis test at a significant level of 5% and the degree of freedom = 58, it can be seen that $t_{stat} = 1.217$ and $t_{table} = 2.000$, so $t_{stat} < t_{table}$ which means there is no difference in the value of the initial mathematical ability between the control class and the experimental class in X RPL Even Semester Students of SMK Muhammadiyah Majenang 2015/2016 Academic Year who use e-learning-based Student Worksheets with students who use Student Worksheets (LKS)) conventional.

2. Mathematics Learning Outcomes

The value of student learning outcomes obtained from the results of the posttest grades VIII A and VIII G from the results of research and use the questions that can be used to determine student learning outcomes, the questions consist of 18 questions. Summary of the description of the mathematics learning outcomes of the experimental class and the control class can be seen in Table 6.

Table 6. Summary of Learning Outcomes Data

Class	**Experimentation Class (X RPL 3)**	**Control class (X RPL 1)**
The highest score	78.947	84,211
Lowest Value	42,105	36,842
Average	60,526	54,211
S	9,037	9,037
S^2	81,670	135,925
Lots of data	30	30

Source: Kuirkulum SMK Muh. Majenang

The normality test is used to find out whether or not the normal distribution of the initial ability of each experimental class and dick data. Researchers performed 2 times the normality test calculation, namely the normality test for the experimental class and for the control class. The summary of the results of the initial ability normality test can be seen in Table 7.

Table 7. Summary of Test Results on the Normality of Learning Outcomes

Variable	**Experimentation Class (X RPL 3)**	**Control class (X RPL 1)**
x^2	3.671	4.798
(α)	5%	5%
Dk (k-1)	3	3
x^2_{table}	7.815	7.815
Testing criteria	Samples are normally distributed if $\chi^2{}_{count} \leq \chi^2{}_{table}$	
Information	NORMAL	NORMAL

From the normality test, the significance level is 5% and the degree of freedom = 3, it can be seen that $\chi^2{}_{count} = 3.671$ and $\chi^2{}_{table} = 7.815$ so $\chi^2{}_{count} < \chi^2{}_{table}$, which means the learning outcomes of experimental class students are normally distributed. In the control class of 5% significance level and degree of freedom = 3, it can be seen that $\chi^2{}_{count} = 4.798$ and $\chi^2{}_{table} =$

7.815, which means the value of the learning outcomes of control class students is normally distributed.

The homogeneity test on learning outcome data is intended to investigate whether all samples in the population have the same variance or not. Researchers performed homogeneity test calculations 2 times, namely the homogeneity test for the experimental class and for the control class. The summary of the results of the initial ability normality test can be seen in Table 8.

Table 8. Summary of Homogeneity Test Results Learning Outcomes

Variable	Experimentation Class (X RPL 3)	Control class (X RPL 1)
S_1^2	81.670	135.925
$\chi^2{}_{count}$	1.861	
$\chi^2{}_{table}$	$\chi^2{}_{table}$	
(α)	5%	5%
Dk (k-1)	29	29
Testing criteria	Samples are normally distributed if $\chi^2{}_{count} \leq \chi^2{}_{table}$	
Information	HOMOGENEOUS	

From the homogeneity test at a significant level of 5% degrees of freedom = 2, it can be seen that $\chi^2{}_{count} = 1.861$ and $\chi^2{}_{table} = 3.481$, so $\chi^2{}_{count} < \chi^2{}_{tabel}$, which means that both classes have the same variance (homogeneous).

The summary of hypothesized test scores in terms of learning outcomes can be seen in Tables 9 and 10.

Table 9. Summary of Hypothesis Test Results of Two Parties Learning Outcomes

t_{count}	t_{table}	α	Dk	Information
2.345	2.000	5%	58	H_o received H_1 rejected

From the similarity hypothesis test at a significant level of 5% and the degree of freedom = 58, it can be seen that $t_{count} = 2.345$ and $t_{table} = 2.000$, so $t_{count} > t_{tabel}$ which means that there is a difference in the value of mathematics learning outcomes between the control class and the experimental class in class X RPL students in the even semester of SMK Muhammadiyah Majenang 2015/2016 academic year using e-learning based student worksheets with students using student worksheets (LKS) conventional

Table 10. Summary of the Results of the One Party Hypothesis Test Learning Outcomes

t_{count}	t_{table}	α	df	Information
2.345	1.670	5%	58	H_o received H_1 rejected

From the similarity hypothesis test at a significant level of 5% and the degree of freedom = 58, it can be seen that $t_{count} = 2.435$ and $t_{table} = 1.670$, so $t_{count} > t_{table}$ which means learning that uses e-learning based Student Worksheets is better than students who use conventional Student Worksheets (LKS)

CONCLUSION

Based on the results of research and discussion as described, several research conclusions can be drawn as follows.

1. There is a significant difference between students' mathematics learning outcomes using e-learning based student learning sheets and conventional student worksheets in class X students of the even semester of SMK Muhammadiyah Majenang for the 2015/2016 academic year. This

is indicated by the results of the first hypothesis test wherewith a significant level of 5% with a degree of freedom 58, a value is obtained $t_{count} = 2.345$ and $t_{table} = 2.000$, which means $t_{count} > t_{table}$, so H_o rejected, H_1 received.

2. 2. Mathematics learning outcomes that use e-learning based student learning sheets are better than conventional student worksheets in class X students of the even semester of SMK Muhammadiyah Majenang for the 2015/2016 academic year. This is indicated by the results of the second hypothesis test wherewith a significant level of 5% with a degree of freedom 58, a value is obtained $t_{count} = 2.345$ and $t_{table} = 1.670$, which means $t_{count} > t_{table}$, so H_o rejected, H_1 received.

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