The Effectiveness Of Using Virtual Simulation Media With Macromedia Flash Combine With Experimental Method To Improve Students' Learning Outcomes In Dynamics Electric's Subject For The First Grade of SMAN 1 Perbaungan A.Y. 2012/2013

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of using virtual simulation media with macromedia flash combine with experimental method to improve students' learning outcomes in dynamics electric's subject for the first grade of SMA N 1 Perbaungan A.Y. 2012/2013. The research method was quasi experimental. The population were all students at X class consist of 8 classes SMA N1 Perbaungan. The sample of this research conduct two classes and consist of 79 students, here class X2 as experiment class and class X3 as control class and define by random cluster sampling. The results that were obtained: post-test mean value of the experimental class was 79.23 and 67.50 was the mean value for control class. Standard deviation for two classes were 10.04 and 11.27. Normality test result from the both samples was normal and homogenous, the testing criterion was accept H_0 if $-1.67 < t' < 1.67$ and refuse H_o in other condition. Here, H_0 was refused because t' is 4.88 and H_a was accepted. And the other side, the gain of experimental class (0.7) is higher than control class (0.4) with the activity of students was 67.27. So that there was the effectiveness of using virtual simulation media with macromedia flash combine with experimental method to improve students' learning outcomes in dynamics electric's subject for the first grade of SMA N 1 Perbaungan.

The Key words: Learning Outcomes, Virtual Simulation Media, Macromedia Flash

Introduction

Education is one of efforts to develop the intellectual life of the nation and to improve the quality of human resources. Therefore, education plays an important role towards the progress of a nation. This has been recognized both by the government where so many efforts have been undertaken to improve the quality of education in Indonesia. Such as curriculum improvement, teacher quality improvement, provisioning the International/ Bilingual schools that have the ability to competing and so forth.

Education is not just acquired in a short time, but it requires a learning process. Learning is a process of one's efforts to obtain a new behavior changes as a whole, as a result of his own experience in the interaction with the environment.

Therefore, researchers and other educators give the considerable time to do a study on improving the quality of education, particularly in improving the quality of teachers. As Slameto (2003) states that "the role of teachers has increased from as a teacher became a director of learning process. As director of learning

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process, duties and responsibilities of teachers are more increase, including increasing the function of teachers as lesson planning, learning managers, appraisers learning outcomes, learning motivator, and as a mentor".

Nowadays, when students do the learning, students activities are usually dominated by the writing, recording, listening to the teacher explain and read a book. These habits are only elements of writing or words that cause only the left brain are working, while the right brain is not working at the time of study. This imbalance makes the students think that learning is not fun, same with learn physics at school.

Physics teacher who gave lessons with lectures method, invite students to read and memorize materials tend to make students feel bored, annoyed and a lack of willingness in the minds of students for the depths. Teachers can make students feel interested and motivated in many ways, one of which is to use the media and the different methods of learning and teaching interesting because of the use of media in teaching and learning and a desire to generate new interest, to encourage motivation and stimulation of learning activities, and even take effect -psychological effects on students.

According to demands of teacher professionalism, it still got the problem that many teachers who lack knowledge of learning media as a means of supporting learning success. On the other hand there are some teachers who are already making use of learning media, but the form and ways to apply is outdated or unsatisfactory success.

According to the result of observation during the researcher running the PPL (Experience Field Program) in SMA N 1 Perbaungan, the students consider that physics was "a scary" lesson. This means that students are worried that physics will make them not pass the national examination and also they do not want to enter science class for the class X. According to the interview with the physics teacher, the mark of the students three years ago have the average about 60.15, but when using the media a year ago like the power point, the mark of them become increase and can achieve the mark average. But it's average mark of the student just 77.6 whereas the minimal achievement criteria at that school is 65.

The low physics student's marks caused by students do not understand the material that presented to them. From the main factor of a lack of student learning outcomes in learning physics, it is necessary to increase learning outcomes by combining experimental methods with media learning interesting and fun. One of the instructional media will be given to students is assembled media simulation of macromedia flash.

Physics is a subject that is difficult by students considered because physics has a lot of formulas. This is caused because the students think the formula is more important than the concept. Though students must first understand the theories and concepts of Physics and then, from that concept, students can understand how to solve problems in physics. Not just use the lecture method alone, but also use experimental method so that the students better understand the concepts of what is presented in theory. Lack of teacher that use the

media make the researcher choose virtual simulation media that is expected able to improve the students learning outcome. Researcher hope with using the virtual simulation media and experimental method, the learning outcomes of students can be increase more than two years before.

With the virtual simulation learning media combine with experimental method, students can more easily understand the physics concepts that are abstract. Based on these problems, it is necessary to research "The Effectiveness of using Virtual Simulation Media with Macromedia Flash Combine with Experimental Method to Improve Students' Learning Outcomes in Dynamics Electric's Subject for the First Grade of SMA N 1 Perbaungan A.Y. 2012/2013"

Objective

Referring to the formulation of the problem, the purpose of this research is:

1. Examine the effectiveness of using virtual simulation media with macromedia flash combine with experimental method with learning without the using of virtual simulation media and experimental method to improve learning outcomes in dynamic electric's subject for the first grade of SMA N 1 Perbaungan AY. 2012/2013.

2. Know the students' activity when using of virtual simulation media combine with experimental method in dynamic electric's subject.

Methodology

This research is pseudo experiment (quasi-experimental), which is done by comparing the results of the pretest and posttest in the experimental class with control class.

The steps in this research are as follows:

a. The preparation stage include:
   1. Consultancy and research proposals
   2. Prepare lesson plans
   3. Compiling research instrument

b. Stages of research, including:
   1. Implement teaching and learning activities.
   2. Provide pretest in both groups to determine the ability of students to allow for the early formation of a heterogeneous group.
   3. Implement learning using virtual simulation media combine with experimental method in experiment class and learning without using virtual simulation media combine with experimental method in control class.
   4. Giving posttest in both study groups as an increased understanding of the concept analysis of students after being given treatment.

c. Stage of the data
   1. Pretest data analysis
   2. Posttest data analysis
   3. Take the conclusion

Research Result

This research was quasi experimental research involving two classes that were given different treatments, namely experiment class were treated by using Virtual Simulation Media combine with experimental method and control

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class were treated without using Virtual Simulation Media and both of them in Direct Instruction Learning Model. The population of this research was all students at year X of SMA N 1 Perbaungan and consist of 8 classes. The sample of this research as much as 2 classes totaling 79 students, namely the class X-2 (experimental class) and X-3 (control class) SMA Negeri 1 Perbaungan.

In the beginning of research, both of classes given pre-test which aims to determine whether the initial ability of students in both classes were same or not. But firstly the problem of pre-test must be validated. In this section, the research was using the content validation because this kind of validation was conducted by the expert directly. Content validation is used to measure the particular objective that parallel with material. Here the test was validated by three experts namely 2 lectures and 1 teacher. They are Juniar Hutahaean, R. Tarigan, and Jumiati.

Before get the final data, data from research that just have true and false correction were processed become one part for the control class and one part for the experimental class.

Based on the data of research result obtained the mean value of the pre-test in experimental class before given treatment is 40.12 and the standard deviation is 9.49. While the mean value of pre-test obtained in control class is 41.37 and the standard deviation is 11.43.

After the both of classes are given by different treatment, then both classes are also given post-test. The form and number of problems are same with pre-test that have done before.

Based on the data of research result, the mean value in experimental class is 79.23 and the standard deviation is 10.04. While in control class obtained the mean value of student's post-test is 67.50 and standard deviation is 11.27.

The mean value get from process calculation of unfinished data that just have true and false form. The true answer of the problem is amount from all of data. And then calculate the mean value of the data research of experimental and control class.

Before conducted the hypothesis test, firstly conducted prerequisite test of data that is normality test using Liliefors test. Based on Liliefors test that $L_{count} < L_{table}$ thus be concluded that pre-test data of both class are normally distributed towards population.

Homogeneity test conducted to determine whether sample class derived from a homogeneous population or not, meant whether the sample used in this research may represent the entire population.

Homogeneity test of data is done by F-test. From the test, the value of $F_{count} < F_{table}$ which means that the sample used in this research revealed as homogeneous or can represent the entire population.

Based on calculation obtained that pre-test value $t_{count} < t_{table}$ that is -0.528 < 1.99 then Ho is accepted so it can be concluded that the initial ability of students in experimental class with the initial ability of students in control class are same.

After obtained the pre-test data of both class is normal, homogeneous and there was no significant difference, then both of

sample research are given different treatment, the experimental class is given the treatment by applying Virtual Simulation Media combine with Experimental Method, while the control class is given without using Virtual Simulation Media.

Hypothesis testing for posttest result is a requirement that used to determine whether the Ha in the research accepted or rejected. The data that used in this hypothesis take from experiment class and control class. Hypothesis testing is performed using one side t-test, that is right side at the significance level $\alpha = 0.05$, with testing criteria: Ha will receive if $t_{count} > t_{table}$. Result calculation of hypothesis test briefly can be seen below:

Data	Mean	t_{count}	t_{table}	Conclusion
Post-test of experimental class	79.23			
		4.88	1.66	Ha receive
Post-test of control class	67.50			

From table above, $t_{count} > t_{table}$, so Ha is received and Ho is rejected, so the student's achievement that taught by Virtual Simulation Media combine with Experimental Method is significant higher than without using Virtual Simulation Media in topic Dynamics Electric.

After getting the value of pretest and posttest experimental class and control class, we look for the difference of pretest and posttest from experimental and control class.

Class	Pre test	Post test	Gain	Effectiveness
Experimental	40.13	79.23	0.7 (high)	Experimental class is more effective than Control class
Control	41.37	67.50	0.4 (medium)	

From table above, the class that using of Virtual Simulation Media combine with Experimental Method is effective when doing on dynamics electric topic.

Discussion

The result of research shows the effectiveness of using Virtual Simulation Media combine with Experimental Method in Dynamics Electric topic at year X of SMA N1 Perbaungan. This was reinforced by the acquisition of the mean value of 79.23 post-test in experimental class with a standard deviation of 10.04. Where as in control class the mean values obtained post-test of 67.50 with a standard deviation of 11.27. From the data above, average post-test value of experiment class is bigger than control class. The increasing of post-test value is caused by gived student the treatment after pre-test done. In experimental class gived the treatment using Virtual Simulation Media combine with Experimental Method and control class gived the treatment without using Virtual Simulation Media.

In addition, the result of research showed that Virtual Simulation Media combine with Experimental Method was also more effective than without using Virtual Simulation Media in Dynamics Electric for grade X SMA N 1 Perbaungan. It was determined from the three requirements of an effectiveness learning they are the

instrument, learning mastery and observation result. The mean result instrument in experimental class that use Virtual Simulation Media combine with Experimental Method, namely 79.23 and included in good category, while the mean result in control class that use without Virtual Simulation Media combine with experimental method, namely 67.50 and not fulfill the requirement of good instrument.

As a result of mastery learning of class in experimental class that use Virtual Simulation Media combine with Experimental Method is higher than the control class that teached without Virtual Simulation Media. It's proved by the different result of value average in experimental class and control class. From the observation result by the observer, found that the mean value of activity in experimental class that use Virtual Simulation Media combine with Experimental Method at meeting I was 59.72, in meeting II was 69.02, and in meeting III was 73.08, so the mean for the entire meeting was 67.27 included in Active category.

Conclusion

Based on the research result, data analysis, and discussion so can be concluded that :

1. The increasing of the mastery of dynamics electric topic to student that using Virtual Simulation Media combine Experimental Method significantly is higher than student who get without using Virtual Simulation Media combine with experimental method.

Mean value of Experimental Class is 79.23 and mean value of Control Class is 67.50.

2. Students at Experimental class is include to the active class in learning process because the value of students activity is 67.27

3. Learning with using Virtual Simulation Media combine with Experimental Method (Experimental Class) is more effective than learning without Virtual Simulation Media combine with Experimental Method (Control Class). It proved from the Gain of Experimental Class (0.7) is higher than Control Class (0.4)

Suggestion

Based on research result and discussion before, researcher give suggestions as follows :

1. Using Media Virtual Simulation combine with Experimental Method to teach the students is crucial method, because teacher must know how to manage the time for showing the media and combine experimental, to make all stages is done well, it takes time allocation as well as possible.

2. Media virtual simulation combine experimental method need macromedia flash and practical instrument. So, teacher must provide the simulation in macromedia flash before and then continued with simple experiment.

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