THE EFFECT OF PROBLEM BASED LEARNING MODEL ASSISTED CONCEPT MAP TO AUTHENTIC PROBLEM SOLVING SKILLS TOPIC ON DYNAMIC ELECTRIC GRADE X SMA NEGERI 1 SIDIKALANG A.Y 2015/2016

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ABSTRACT

The purpose of this study was to determine the effect of problem based learning model to authentic problem solving skills of students topic on dynamic electric grade X SMA Negeri 1 Sidikalang . This type of research is quasi-experimental. The population of this entire class X SMA Negeri 1 Sidikalang consist of 11 classes. The sample in this study was taken by a random sampling of two classes that's X-8 class asexperiment class with 23 students and X-7 class as control class with 26 students. The instrument used to determine student learning outcomes in the material dynamic electric in the form of essay test with numbered 10 and observation sheet. The results obtained by testing hypotheses is concluded that there is a significant relationship between use problem based learning model to authentic problem solving skills of students grade X SMA Negeri 1 Sidikalang.

Keywords: *problem based learning, authentic problem solving*

Introduction

Education is one of the efforts to improve the quality of human resources. Education, in the sense of conscious and deliberate effort to zz the lifelong learning process, touching all level of society, all walks of life and all ages. Awareness of the importance of education has pushed efforts and attention from the whole society towards the development of education, in particular the development of information technology, where knowledge of physics that is closely associated with science and technology needs to be developed starting from the basic level to be able to complete and survive in conditions that era always evolve over time, so that the learning process should be able to develop the ability of students complete in order to have quality human resources well to face the challenges.

The main component in education is teachers. The teacher is required to compensate for even go beyond the development of science and technology developed in the community. Through the touch of a teacher at the school is expected to produce learners who are extremely competent and ready to face life's challenges with confidence and confidence is high (Sanjaya, 2006).

In improving the quality of education, the process of teaching and learning in school is a very important activity, because the learning process is a process that contains a series of actions of teachers and students on the basis of reciprocal relationship or interaction. Interaction in the event of learning not only the relationship between teachers and students, but in the form of educational interaction. Educational value due to the interaction of teaching and learning activities undertaken are directed to achieve specific goals before the instruction is done, teachers consciously planned teaching activities systematically by utilizing everything for the process of teaching. Through the process of the optimal expected national education goals can be achieved.

Teachers need to have knowledge about the approaches and techniques of teaching is good and right so that learning activities can take place effectively and efficiently according expected goals. Whether or not the teaching quality will affect the success of student learning. Teachers should be able to create a classroom atmosphere that is conducive to the survival of student learning activities. One is the use of teaching proper technique, especially in learning physics. Physics is often seen as a hard science students with theoretical and difficult questions. This statement obtained by author when implementationPPLT-UNIMED in SMA Negeri 1 Sidikalang,there are several problems were found that many students who consider physics as subjects frightening and assume Physics as a subject that is difficult studied so the average value of physics is still under 70 .

Some problems in the learning process of the students are caused by environmental factors and social students. The low learning outcomes physics based on implementation PPLT, due to: (1) Physical Learning model which is less varied (conventional model) where the learning process is performed centrally on the teacher (teacher centered) in order to explain, give examples, exercises and assignments. Variation of teaching methods that the teacher is less adjusted based on the characteristics of the material taught. (2) Laboratory equipment is still incomplete (3) Teachers rarely use learning media. (4) Teachers

are rarely offered an opportunity for students to interact with peers or with teachers in developing students' knowledge that causes students being passive and difficult to understand and master the subject matter, so that the activities and learning outcomes less than the maximum.

Problem Based Learning Model is an innovation in teaching because of the student's problem solving skills learning and teaching process truly optimized through the process of work group or team that is systematic, so that students can empower, honing, testing, and develop the capacity to think on an sustainably.

The essence of problem based learning consist of presenting student with autentic and meaningfull problem situation that can serve as springboard for investigation and inquiry. Arends (2012:397)

Learning is based on the problem as one of the student-centered learning and adhering to the constructivism learning paradigm. A paradigm shift in the learning process that had been centered on the teacher (teacher centered) into a student-centered learning (student centered) is expect encourage students to be actively building the knowledge, attitudes, and be Centered learning process students will make students gain the opportunity and facilities to construct their own knowledge so that students can gain in-depth knowledge, and ultimately improve the quality of student learning and students play an active role in constructing the concepts learned.

The use of Problem Based Learning model can improve student learning outcomes. Research on the Problem Based Learning Model is already been done and reviewed by Tresia (2015) the average value of pretest students 55.78 and the average value of postest 87.75. The conclusion that can be seen in the thesis of Tresia that this model can improve student learning outcomes significantly, but this study has weakness in preparing for media and teaching aids used, as well as the allocation of time less efficiently so that teaching and learning results obtained are still lacking good. Efforts will be made author to overcome these weaknesses is to provide learning model Problem Based Learning with Power Point as a learning media, so that with the power point help of students more easily understand the concept of dynamic electricity. In addition, authors will provide student worksheet relevant to daily life easier so that students do and make the lesson plan with the allocation of time as efficiently as possible so that the expected result will be a better student learning outcome.

Method of Research

The research was conducted at SMAN 1 Sidikalang which is located in Jln. Dr F L Tobing no 1 Sidikalang. The research was planned in April-May Semester II A.Y 2015 / 2016.

Population in this research is all class X Semester II SMA Negeri 1 Sidikalang.

The sample in this study consisted of two classes, namely as an experimental class and a control class were taken using cluster random sampling.

These include quasi experimental study, namely a study intended to determine whether there is influence from something imposed on students as research subjects. Intended effect is to increase learning outcomes and social skills of students with learning model specified.

The study involved two classes, namely the experimental and control classes, where the class is given two distinct differences. Experimental class given problem based learning while the control group was given conventional learning models.

Data the that get will tested with normality test and liliefors test to know the data normal or not. Then after normality test we will do homogeneity of variance similarity to know both of class were homogenity. If $F_{count} < F_{table}$ so the population have the same variance (significant @ = 0.05). The last is hypothesis test(t test of two part).
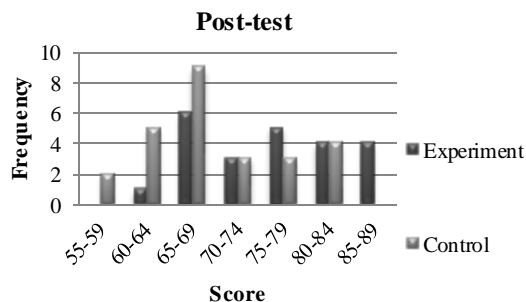
Result and Discussion

Result of the researh in SMA N 1 Sidikalang show the average pretest value in experiment class 26.62 and controll class 22.69. and according to normality test and homogeneity test the sample taken from normal and homogeneity population. And t test of two part, pretest value $t_{count} < t_{table} = 1.556 < 2.013$ so, H_0 is accapted and H_a is rejected. It's mean that the initial knowladge of experiment class and control class is homogen.
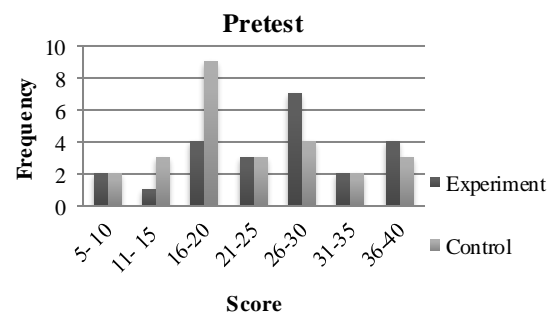
In the post-test value, experiment class is 74.34 and control class is 68.07, from t test get that $t_{count} > t_{table} = 3.02 > 1.66$, it's mean that H_0 is rejected and H_a is accapted and problem solving skills of

students of experiment class is bigger than control class. class is homogen.

It's mean that there are the effect of problem based learning model to problem solving skills of students in SMA N 1 Sidikalang A.Y 2015/2016.

Discussion

Based on the results of the research, before being given lessons to both sample groups first performed pre-test to determine the ability of beginning students by giving instrument research that consist 10 essay test. The results obtained the average pre-test experimental class stu 26.52 and 22.69 for the control classes. A being given a different treatment of the two classes of samples, do posttest and obtained an average value of post-test experiment class is 74.34 and control class is 68.07. Based on the average post-test concluded that there are differences in learning outcomes (post test) two sample groups. By using problem based learning model obtained better student learning outcomes because during the learning process of students learning in the form of a group discussion so that students become more active. Whereas in conventional learning, students are not divided into groups. Students just received an explanation from the teacher. And It showed that posttest for learning process using problem based learning was distributed more to the right side than posttest using conventional learning. It also proved that PBL is effective to develop authentic problem solving skills of students.

The results of this study indicate that the learning of physics by using model Authentic Problem significant effect on students' problem-solving skills. From the research that has been done is known that the problem solving skills of students that learned to use models Authentic Problem in higher than problem-solving skills of students taught by conventional models. In a further test is known that the model Problem based learning significant effect on problem-solving skills. The results of analysis that $t_{count} = 3.02 > t_{table} = 1.66$. Means the result of problem-solving skills of students that learned with Authentic Problem Based Learning model of

higher than problem-solving skill of students that learned by conventional models. The results of this study are also in accordance with the opinion of Barrows & Neo Lynda (2007) that students who have experienced PBL is students who perform better in problem solving, self-renewal, and group work because he had studied in the context of the workplace to cope with ambiguity and uncertainty (Barrows & Neo Lynda, 2007: 7). Susianna research (2012) stated that the teaching of science by using Authentic Problem Based Learning can increase creativity, inter-personal relations, concept mastery. The results of this study stated that the problem solving skills of students that learned with the model Authentic Problem Based Learning is higher than the problem solving ability of students that learned with the model Problem Based Learning. This is because Authentic poblem Based Learning has special characteristics that are not found on the model of Problem Based Learning is at the stage of encountering the problem. At this stage, the students determine their own formulation of the problem and hypotheses to be used in the stage the problem. In addition, on the model Authentic Problem Based Learning are also tackling the learning stages issues. At this stage, the students determine which hypothesis is right and determine the learning resources they will use. These learning resources should come from the Internet or books that are relevant. This stage allows learners to develop all the skills and become more proficient in the learning process and take responsibility for their own learning. Whereas in the conventional model students are not required to gather the relevant source they only use the available resources, such as books. At Authentic Problem Based Learning models also include stages of summarizing and knowledge abstraction. At this stage, students are asked to create a flowchart or abstract. This flowchart can be easier for students to relearn the material that has been learned and also allows students to carry out reflection.

Conclussion

Based on the research results obtained from the data analysis and hypothesis testing, it can be summed up as follows: (1). The average results of students on experiment class were treated with problem based learning increase from 26.52 to 74.34. (2). Based on the calculation t test showed that $t_{count} > t_{table}$ 3.02 > 1.67 so H_a is accepted. Based on the data obtained it can be concluded that there is the effect of using problem based learning model to authentic problem solving skills of students topic on dynamic electric in class X SMA Negeri 1 Sidikalang A.Y 2015/2016. (3). The results of authentic problem

solving skills of student using Problem based learning model is better than conventional learning topic on dynamic electric thats in experiment class 74.34 and control class 68.07.

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