

THE EFFECT OF PROBLEM-BASED LEARNING MODEL IN CURRICULUM 2013 TOWARDS THE STUDENTS LEARNING OUTCOMES ON LINEAR MOTION TOPIC IN GRADE X SMAN 2 KISARAN A.Y 2014/2015

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ABSTRACT

The aim of this research was known the effect of problem based learning model in Curriculum 2013 towards students' learning outcomes on topic Linear Motion in Grade X-MIA SMAN 2 Kisaran. Research method was quasi-experiment. The population were all of students in grade X-MIA SMAN 2Kisaran, that consist of 7 classes. The sample of this research was taken by purposive sampling technique. The class X MIA-4 as experimental class used problem based learning model consist of 36 students, and class X MIA-5 as control class used conventional learning consist of 33 students. Instruments that used in this research were non-test(questionnaire) and test instrument. Then data that obtained from the questionnaire analyzed by tabulating using Microsoft excel. The result from the questionnaire (done by the teacher) has good standard. It has the average value from meeting I until meeting III have 90.67. While the data that got from the test instrument was analyzed by t-test statistical analysis. Based on research result using Problem based-learning model that focus on planning, learning process and evaluation design shown that there were significant enhancement in experimental class. The results that were obtained: pre-test mean value of experiment class was 35.56 and 31.21 for control class and then post-test mean value of the experiment class was 58.89 and 38.79 was the mean value for control class. It can be concluded that the student's learning outcomes using problem based learning model greater than conventional learning on Linear Motion topic in grade X-MIA SMA N 2Kisaran.

Key word: Problem-Based Learning Model, Students' Learning Outcome, Physic

INTRODUCTION

Education is essentially a humanize humans, education is very strategic to the intellectual life of the nation and is required in order to improve the quality of the nation as a whole. Education is a conscious and

deliberate effort to create an atmosphere of learning and the learning process so that learners are actively developing the potential for him to have the spiritual strength of religious, self-control, personality, intelligence, noble character,

and skills needed him, society, nation and state.

Basically the educational demands a lot has changed. Educators need to develop and implement teaching and learning activities in which children can actively construct their own knowledge. This is consistent with the view that constructivism learning success depends not only on the environment conditions of learning, but also on the prior knowledge of students. Learning involves the creation of "meaning" by the students of what they do, see, and hear.

The issue now is how to find the best way to convey the concepts being taught so that students can use and remember longer the concept. How can teachers communicate well with their students. How teachers can broaden the diverse thinking of all students, so can learn how the concept and how to relate it to real life. How can as a good and wise teacher is able to use the model of learning with regard to solving the problem.

Brunner in Trianto(2009: 91) states that starts to look for solutions and the accompanying knowledge, generating knowledge that is really meaningful. A logical consequence, because by trying to seek a solution to the problem independently will give a concrete experience, with experience, it can be used also to solve such problems, because that experience can give special meaning for learners.

Generally PBL has a great potential to foster students' higher order thinking skills, especially critical thinking ability. The links between PBL and critical thinking ability outside of medical field are still lacking with substantial evidence to be deemed conclusive, especially

from education point of views. Therefore, the study on PBL and critical thinking remains equivocal and leads to inconclusive evidence. This review however provides some hints that PBL could be more effective in a long-term duration (Aliyas:2011).

Bekti Wulandari says that The concept of problem solving in the PBL model's done by the group discussions. PBL method is more emphasis on the exchange of ideas and sharing of experience in problem solving. Students who have high motivation would be more interested to increase knowledge and desire to learn new things in order to solve a problem related to the real world.

Learning is an attempt to learned the students. Implicitly, there is a learning activity in selecting, establishing, developing teaching methods to get the desired result, based on the existing conditions of learning. This activity is the core of the learning plan (Husamah, 2013: 34).

Learning outcomes is related to learning activity because learning activity is a process, while learning outcomes are achieved in part the result of a person after experiencing the learning process by first do the evaluation of the learning process is done. The results of the study indicate a high or low teacher success in delivering course material in the learning process. Sanjaya, Wina (2006: 52) says that there are several factors that can influence the activities of the learning system, including: (1) teacher, is the main component of which is crucial in the implementation of an instructional strategy, (2) Students, is a unique organism that developed in accordance with the stage of

development, (3) factors that support facilities and infrastructure directly to the learning process, (4) environmental factors.

In each curriculum, assessment system becomes a very important thing to note, given the assessment is the process of gathering information/evidence through measurements, interpret, describe, and interpret the evidence of measurement results.

Curriculum 2013 signaled an important self-assessment system, where students can assess their own abilities. Assessment system based on three(3) important aspects, namely: knowledge, skill and attitude.

The achievement of expected results from the implementation of the curriculum in 2013 this is the learner shave the opportunity to develop their full potential in order to create quality human resources, not only intelligent but have skills and good character through balancing the three aspects (cognitive, affective, and psychomotor), as well as the implementation of this curriculum can be implemented evenly so not only in the center and the surrounding area that could benefit from the curriculum. In addition, students are also trained to face a future full of globalization (Wiranto, 2013: 1).

But in fact the field, although many made design or a solid plan and good learning, there are still many students who get bad grades or poor outcomes after they learn a subject. For example in the subjects of Physics which is considered difficult by all students. Many students who think physics is a difficult subject because they often get low grades in their exam results. If such is the case, then programs and plans that have been

made are no longer relevant to what would be achieved. In fact, there are so many teachers who simply make a good program. In another sense, the teacher can only make the program and then early planning is not implemented in the learning process. For example, a teacher only explain what he knows and he can see from the book, and not based on what he had made in the beginning of the program or the first planning or not in accordance with the draft of Lesson Plan that he had made. Not paying attention to what the main purpose of the learning outcomes. So, what should be the main goal which is made as an indicator of a learning process was not achieved. Due to the material or any material that is taught and what is given to students in accordance with the indicators (results to be achieved). Even worse, the different indicators towards the process, and their relevance of indicators and evaluation process of the learning process can make students overwhelmed and can not reach from what should have been achieved in the subjects in a particular topic. And in the end the students still thought physics was very difficult and they will get value or poor results.

In conformity of indicators (objectives to be achieved), learning and evaluation process may impede the achievement of learning objectives and learning outcomes that will get worse anyway and it set in curriculum 2013. Based on the problems identified, the researchers are interested in studying it further. Researchers wanted to try to do a study titled "The Effects of Problem-Based Learning Model In Curriculum 2013 towards the Student Outcomes in Topic Uniform Linear Motion in

Grade X SMAN 2 KISARAN.” expected the results could provide benefits for teachers, especially in providing an alternative model of learning in classroom, particularly in efforts to achieve the purpose and the indicator that have been planned in Lesson plan and also can increase the student learning achievement.

RESEARCH METHOD

This research will be conducted Class X of SMA Negeri 2 Kisaran academic year 2014-2015. The population in this research is all students at Class X of SMA N 2Kisaran and consist of 6 classes. With the amount of students average 38 students in each class. Sampling technique in this research use purposive sampling. This technique provide the same chance for every part of population to be selected into sample. The selected sample and obtained two classes that used as experiment and control class. From the result of the selection, so X MIA 4 class choosed as experiment class that treat by Problem-based learning model and X MIA 5as control class use the conventional learning.

In this study also involved the teacher as supervisor. The teacher was watch over the learning process that match with the curriculum 2013, so in this study consist of test and non-test instrument. Non-test(questioner) instrument was for the supervisor and test instrument was for the students.

This research will conducted two classes who give the different treatment. to know the student's achievement used test for both of classes before and after give the treatment. The design of research is follow:

Table 1 Research Design

Sample	Pre-Test	Treatme nt	Post-Test
Experiment	T ₁	X ₁	T ₂
Control	T ₁	X ₂	T ₂

Explanation:

T₁: Pre-Test

T₂: Post-Test

X₁: Problem Based Learning Model

X₂: Conventional model

The selection of data aimed to observe whether the samples come from normal distribution population or not. The test used is Liliefors test and Homogeneity test, to know the homogeneity of both samples used formula as follows (Sudjana, 2009) :

$$F_{count} = \frac{S_1^2}{S_2^2}$$

Description:

S₁² = Variance in experimental class

S₂² = Variance in control class

If F_{count} ≥ F_{table}, H₀ is refused (have different variance) where the

F_{table} = F_{(1-α)(n-1)} < F <

F_{1/2α(n₁-1, n₂-1)} obtained from the distribution list F with α = 0.1.

Hypothesistest use t-test with formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

S is combination of standard deviation can be calculated with formula :

$$S^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

Where:

\bar{x}_1 = Average value in experimental class.

\bar{x}_2 = Average value in control class.

n₁ = Total of sample in experimental class.

n_2 = Total of sample in control class.
 S^2 = Variance
 S_1^2 = Variance in experimental class
 S_2^2 = Variance in control class
 t = t distribution
 Testing criteria is accept H_0 if $-t_{1-\frac{1}{2}\alpha} < t < t_{1-\frac{1}{2}\alpha}$ where $t_{1-\frac{1}{2}\alpha}$ we get from t list with $dk = n_1+n_2-2$ and probability $(1-\frac{1}{2}\alpha)$. To another value of t H_0 is not accept. Value of t_{count} compare with t_{table} get from t table list to $\alpha = 0.05$. If $-t_{1-\frac{1}{2}\alpha} < t < t_{1-\frac{1}{2}\alpha}$ on the level $\alpha = 0.05$ and independent degree $dk = n_1+n_2-2$, so have the same initial ability of student.

Result of Research

This research done in Class X-MIA SMAN 2 Kisaran A.Y. 2014/2015 using two classes as the sample those are experiment class taught by Problem-based Learning model and in control class taught by Conventional Learning.

First activities in this research to test the initial ability the both of control and experiment class was done the pre-test. Based on data that got, it can conclude that the initial ability both of experiment and control class were same, pretest in both experiment and control class got that both of class have the almost same initial ability. It proved by the average of pretest of experiment class has 35.56 while the control class has 31.21.

In the first meeting of this topic using the problem-based learning model, the students in experimental class looks so enthusiastic, because this learning systems was so different like the ordinary learning. This models used by student centered, so it's make the

students more active.. On the other hand, the problem based learning model can bring the students to have objective, confidence, bravery, and also responsibility. Learning process by using problem based learning model also raise the motivation of the students, it can prove from the enhancement of the student activity from the first meeting until the third meeting.

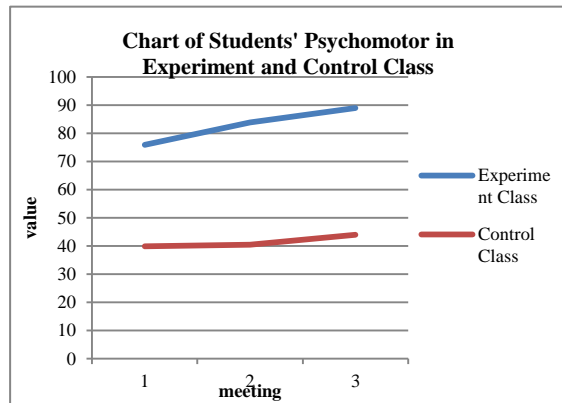


Figure 1 Chart of students' psychomotor in experiment and control class

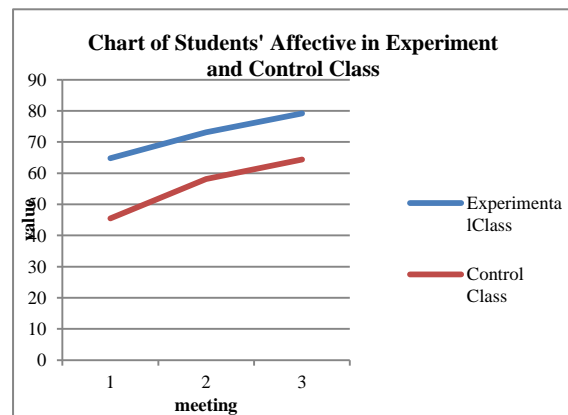


Figure 2 Chart of students' affective in experiment and control class

From the figure above, shown that the process learning by using problem based learning model have the significant enhancement. It's because in the experimental class also using the good process that conformity with the Permendikbud No. 81 A year 2013.

In this learning process the teacher(researcher) was observed by the supervisor, and the supervisors were three of physics teacher in that school. The supervisor asses the teacher how the way to send the lesson material that match with the good standard process, and see the activity of the teacher by the allowing questioner. All of the questioner have the good standard based on the assessment. It has the average value from meeting I until meeting III have 90.67.

The last testing that given to the students to measure the last ability after received the treatment was a posttest. The experiment class that done the treatment has the better value than the control class. The higher value that reached for the experiment class was 80 and the control class value was only in 70.

From the data shown above, the experiment class has the good enhancement of the higher value while the control class have the enough value, so the hypothesis that have been made that is The students learning outcomes in topic uniform linear motion using problem based learning model and its conformity by the plan, learning processed and evaluation processed was greater than conventional learning in grade X SMAN 2 Kisaran.

So, the learning process was proportional with the learning outcomes that got. It has been proved by this research. If the learning

process was good, so the learning outcome was good too and it's contrary.

Problem based learning model is a better than conventional learning. It is better than conventional learning because in problem based learning model student actively participate in the learning process and understand how that they learn by doing experiment. During the implementation of the research showed that problem based learning model bring students directly into scientific process into small periods of time and the training has resulted in an increased understanding of science, more creative thinking, and skills for obtaining and analyzing information as students establish facts, build concepts, and then generate and test explanations or theories. Thus, the students are active learners involved in exploration, questioning, problem solving, inductive reasoning, invention, labeling, and discovery, while in the control class that use direct instruction learning model students just sit and listen to the teacher's explanation without trying to solve problem.

CONCLUSION AND SUGGESTION

Conclusion

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

(1) The learning outcomes that using problem based learning model in curriculum 2013 (emphasize conformity among the indicator, process of learning and process of evaluation) in Topic Uniform Motion in grade X semester I have the highest enhancement, the value of enhancement reach 23.33. Which pretest value has mean 35.56 and

post-test has mean 58.89. (2) While in conventional learning only a bit increase of the learning outcomes. The value of enhancement only up to 7.58. Which the mean value of pretest has 31.21 and the post-test has 38.79. (3) There was a significant effect using Problem Based Learning Model in curriculum 2013 in Topic Linear Motion in grade X semester I. Problem-Based learning model can increase the critical thinking and active to solve the problems. Learning process was proportional with the learning outcomes that got. It has been proved by this research. If the learning process was good, so the learning outcome was good too and it's contrary.

Suggestion

Based on the research result and discussion before, researcher give suggestion as follow:

For the next researcher who will do research in same problem about Problem Based-Learning model, pay attention to the condition of class was difficult to control because discussion chance in teaching and learning process giving chance for some students making noise so bothered other group discussion, and also time allocation that limited making the group discussion is not maximal, and the group discussion result can't present for all group in front of class.

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