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The Influence of Problem Based Learning Model on Scientific Process Skill and Problem Solving Ability of Student

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Abstract: This study aims to determine the average influence of science process skills and problem solving students using Problem Based Learning model and conventional learning, knowing whether the influence of conceptual and procedural knowledge of students who are taught by the model of problem Based Learning is better than students who are taught by Conventional learning. This research is a quasi experimental research. The research population is all students of class X SMA Negeri 1 Bangun Purba semester II academic year 2016/2017. The sample was taken by random class, consist of 2 classes totaling 68 people. Class X-3 as an experimental class taught by Scientific Inquiry model assisted visual media consists of 37 students, class X-2 as control class is taught with conventional learning consists of 31 students. The research instrument uses essay test that is 10 problem of science process skill and 5 problem solving problem. The resulting data were analyzed using t test. The results of the research shows that: the average of the improvement of physics science physics process skill using Problem Based Learning model is in medium category and the average of the improvement of science process skill of students using conventional learning is in low category whereas the average of physics problem solving student use Problem Based Learning model is in the medium category and average problem solving students who use conventional learning is in the category of being, the average increase in students 'science process skills better than the students' science process skills using conventional learning while the average increase in solving The problem of students using Problem Based Learning model of learning is better than solving student problems using conventional learning.

Keywords - Problem Based Learning Model, Process of Science Skill, Problem Solving

I. INTRODUCTION

Education plays an important role in preparing reliable human resources, because education is believed to be able to encourage maximizing students' potential as a reliable resource candidate in order to be critical, logical and innovative in dealing with and solving every problem encountered. Learning should be designed to develop that potential, especially physics learning.

Physics is one of the subjects in science that can be used as a tool to develop analytical and deductive thinking skills in solving problems related to natural events, both qualitatively and quantitatively using mathematics, and can develop knowledge, skills and confidence. Physics has a definite scientific structure [1].

Essentially, Physics is a collection of knowledge, ways of thinking, and investigation (experiment) and its application in effective and efficient learning and able to make students interested and motivated to study Physics. The fact that there is in the field that the process of physics in the classroom tends to be analytical, students tend to memorize the formula but less meaningful for what and how the formula is used, lecture and question and answer method is a method commonly used by teachers in sequence explain, , Practice and give assignments.

Physics learning is expected to provide direct experience to students to understand physics scientifically. As a process, Physics performs scientific activities such as observing, asking, hypothesizing, predicting, finding patterns and relationships, communicating, designing and making, planning and conducting investigations and measuring and counting. These activities are part of the science process skills [2].

Scientific process skills (SPS) is very demanding of students to be actively involved so that it needs to be trained and grown through learning centered on students so that students are skilled in obtaining and reviewing various information about natural phenomena in everyday life. SPS is the thinking skill used by scientists to construct knowledge to solve problems and formulate results [3]. SPS needs to be grown in science learning so students can master well-taught concepts [4].

Lacking of SPS training in students in physics learning, students are difficult to solve problems systematically, it is difficult to digest the subject of questions, it is not easy to determine the quantities of physics and the symbols contained in the question. Students also sometimes still difficult to determine the concepts, principles, theories, laws and formulas used to solve, answer or solve the problem Physics. Whereas in the study of physics is very related to SPS and problem solving skills to make students as active learners in analyzing and applying concepts to solve problems found in everyday life. SPS in physics learning that dimiki by students will be stocked in facing the existing problems, because students are accustomed to doing the process of science in solving problems.

Problem-solving skills are used to link various aspects that can be interpreted in physics because understanding and mastering concepts, principles, and theories, and the laws of physics require problem-solving skills. Physical problems demand the students' skills in using their logic of thinking in answering, or solving, physics problems. Understanding or mastery of concepts, principles, theories, and laws of physics allows students to solve physics problems for that current physics learning should train the ability to solve a problem [5].

Facts that occur in the field is not as expected, because learning in schools has not shown the process of learning Physics that equips students to develop SPS and problem solving skills. Based on the experience of the researcher, the results of observation, interview and discussion with physics teacher friends at SMA Negeri 1 Bangun Purba found that, the learning process is still dominated by the delivery of information, not emphasized on the processing of information through experiments because teachers very rarely use props in practice In the laboratory, this is due to the availability of practice tools are inadequate or incomplete even many tools that have been damaged, while to anticipate it can be used simple tools and even the secondhand items that easily we get around us, especially on Static Fluid material Such as glass cylinders commonly used can be replaced with used tools such as plastic tubes that are given a ruler as scale, for pascal law can be used tools for scrap and pressure can be used hose former. Using scientific method can think more systematic, logical, Ih regular, and thorough.

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Teachers' lessons have not emphasized SPS and problem solving. SPS and problem solving are important for every student because they are used in everyday life, improving scientific skills, quality and living standards. SPS and problem solving also affect private, social, and individual life in a globalized world. SPS and problem solving function as effective competencies to study science and technology, problem solving, individual and social development. SPS and problem solving emphasize skills building and communicate to acquire knowledge, so to familiarize students into physicists, it can be stated that students need to be provided with SPS and problem-solving skills.

The selection of the right learning model plays an important role in improving the quality of physics learning, in particular to improve the SPS and problem solving of teacher students need a learning model that emphasizes the process of knowledge seeking rather than knowledge transfer. Responding to the above problems need a model that involves active learning as well as train students to perform science process skills and problem solving students to improve learning outcomes. One of the learning models that can be implemented in class to train SPS and problem solving of student especially in learning of physics is model of Problem Based Learning (PBL) learning.

PBL is one of the models in accordance with scientific (scientific) approach in learning in the national curriculum. Arends [7] argues that PBL is one of the learning models designed to help students develop their thinking skills, solve problems and intellectual skills, learn the roles of adults by experiencing them through simulated real situations or situations, and become independent learners.

The superiority of the PBL model, according to [8], in achieving the science process skill of the PBL learning model is better than the direct learning model. El-Hay [9] and [10] recommend the use of PBL in teaching activities either in the classroom or at practical experiment place to produce clear benefits for students, such as self-learning improvement, critical thinking, problem solving and communication skills. Tosun [11] PBL is more effective than conventional instruction in improving learning and scientific processing of students' abilities. In addition, he also revealed that PBL increase student access and use knowledge, work in groups and

work together, independent learning and problem solving skill Dwi [12] and Hartono[13] summed up the problem solving skills of Physics using PBL models better than conventional learning.

Based on the above description it can be concluded that the PBL model is quite effective in improving SPS and problem solving skills on the students. SPS and student problem solving skills in teaching and learning process is one of the most important supporting factors in improving students' knowledge in Physics learning. PBL is designed for students to learn to be self-reliant learners, work together to solve problems, and learn to find out, not to be told.

II. METHOD

This research includes the type of quasi experiment research. The research sample consisted of 2 randomly selected classes with cluster random sampling technique and selected two classes as experimental class with Problem Based Learning model and control class with conventional learning. The research design is Pretets-Posttestt control group Design, which will be described in the following table 1.

Table 1. Pretets-Posttestt control group Design

Group	Pretest	Treatment	Posttest
Class experimental	T_{1A}		T_{2A}
	T_{1B}	X	T_{2B}
Class control	T_{1A}		T_{2A}
	T_{1B}	Y	T_{2B}

Information :
T1A : Prasy Skills The Science Process of students is given to the experimental class and control class prior to treatment
T1B : Pretest problem solving skills are given to experiment class and control class before treatment
X : Treatment with Problem Based Learning model
T2A : Posttest Skills The Science Process students are awarded after treatment on the experimental class and control class
T2B : Posttest student problem solving skills are given after the treatment in the experimental class and control class
Y : Treatment with the application of conventional learning
T1A : T2A
T1B : T2B

The instrument used is a test of students' science process skills and problem-solving skills tests. Science process skill test amounted to 10 questions and problem solving skills test amounted to 5 questions.

III. RESULTS AND DISCUSSION

At the beginning of the study the two classes are given pretestt which aims to determine the students' early learning ability in each class. The results of pretestt and posttest of the experimental class and control class in detail can be seen in Table 1. After the sample applied different learning models obtained posttest results in both classes. The results of research with the application of learning model Problem Based Learning (experimental class) and conventional learning (control class) are as follows:

Table 2. Data Pretest and Posttest

variabel	Class	Pretest	Posttest
Skills of the Science Process	Control	29.61	49.19
	Experimental	32.51	72.72
Problem Solving Skills	Control	25.96	54,84
	Experimental	23.22	70,46

Furthermore, the data from pretestt and posttest are related to the extent to which improvement of science process skill and problem solving with normalized N-Gain. N-gain is used to see the improvement of science process skill and problem solving of students from pretestt to posttest done in learning process

Table 3 Gaining Normalized N-Gain Score Level

N-Gain Score	Category
0.00-0.30	*N-gain* low
0.31-0.70	*N-gain* medium
0.71-1.00	*N-gain* high

N-Gain students for experimental class on science process skills in medium category and N-Gain students and problem solving in medium category.

After analyzing the increase, then testing the normality, homogeneity and similarity of two averages. The normality test is used to determine whether the sample comes from a population that is normally distributed or not of the n-gain value of each student. The normality test of n-gain data in the control class and experimental class was conducted by Kolmogorov-Smirnov test using SPSS 17 program with significance level of 0.05 where the normality test result is in Table 4

Table 4. Test of Data Normality of Science Process Skill of students of Experiment Class and Control Class

Class		Kolmogorov-Smirnov^a		
		Alfa(α)	Df	Sig.
Nilai	Experiment	0.05	37	0.74
	Control	0.05	31	0.35

Based on the results of normality output in Table 4, the value of significance obtained the results of the science process skills of experimental class students and controls with a value greater than 0.05, it can be said that the students' experimental science process data skills and control classes are normal.

Testing the homogeneity of two variance of conceptual pretest data between the control class and the experimental class was conducted by Levene test through the SPSS 17.0 program with a significance level of 0.05. After done data process, output view can be seen in Table 5.

Table 5. Homogeneity of Two Preview Variance of Experiment Class Science Process Skills and Control Classes

Results	Significance	df1	df2	Levene Statistic
Skills of the Science Process	0.05	1	68	0.20

Based on the result of homogeneity test of variance by using Levene test in Table 5, for the science process skill, the value of significance is 0.20. This shows that the value of significance is greater than the 0.05 significance level. Then it can be concluded that the control class students and the experimental class come from populations that have the same variance, or both classes are homogeneous

Furthermore, the Normality test of problem solving skills of the Experiment Class and Control is obtained in the following table 6:

Table 6. Normality Test Data of Experimental problem solving skills and Control Class

	Class	Kolmogorov-Smirnov^a		
		Alfa(α)	Df	Sig.
Value	Control	0.05	31	0.74
	Experimental	0.05	37	0.23

Based on the results of normality output in Table 5, the significance value obtained result of problem solving skill of experiment and control class with value greater than 0.05, hence can be said that experiment class problem solving skill data and control class is normal distribution.

Testing the homogeneity of two variance of procedural knowledge between control class and experiment class was done by Levene test through SPSS 17.0 program with significance level 0.05. After done data pengualahan, output view can be seen in Table 7.

Table 7. Homogeneity Two Variance of problem-solving skills of the Experiment Class and Control Class

Result	Signifikansi α	df1	df2	Signifikansi
problem-solving skills	0.05	1	68	0,27

Based on the result of homogeneity test of variance by using Levene test in Table 4.8, for problem-solving skills obtained significance value of 0.27. This shows that the value of significance is greater than the 0.05 significance level. Then it can be concluded that the control class students and the experimental class come from populations that have the same variance, or both classes are homogeneous.

Hypothesis testing done after the data feasibility test requirements are completed and fulfilled, then hypothesis testing is done by using Independent Sample T-Test with the help of SPSS 17. Data of conceptual knowledge as well as procedural knowledge obtained then calculated using t test to see the difference of average Average posttest result of both groups of samples

The first hypothesis test aims to see the difference of posttest result of science process skill between experiment class students taught by model of problem solving learning skill with control class taught by conventional learning. The sound and formulation of the first hypothesis is as follows.

Result of calculation of SPPS 17 obtained test data output posttest science process skill of students who taught with problem-based learning model and the result of science process skill of student taught by conventional learning can be seen in Table 8.

Table 8. Hypothesis Test of Experimental Process Science Skills and Control Classes

		t-test for Equality of Means	
		Significance α	Sig. (2-tailed)
Value	Equal variances assumed	0.05	0.00
	Equal variances not assumed	0.05	0.00

The significance value of 0.00 <0.05, then it can be said that the test results reject H0 or accept Ha in the level of alpha 5%, thus it can be concluded that the science process skills of students who are taught by the problem-based learning model is better than students taught by conventional learning in Learning physics.

The second hypothesis testing aims to see the difference of problem-solving skills between experimental class students who are taught by the problem-based learning model with the control class that is taught by conventional learning.

The results of SPPS 17 obtained statistical test data posttest test problem solving skills of students using problem-based learning model and problem solving skills students using conventional learning can be seen in Table 9

Table 9. Hypothesis Testing Troubleshooting Skills

		t-test for Equality of Means	
		Significance α	Sig. (2-tailed)
Value	Equal variances assumed	0.05	0.00
	Equal variances not assumed	0.05	0.00

Based on Table 9, the significance value obtained is 0.00 <0.05, it can be said that the test results reject H0 or accept Ha in the level of 5% alpha, thus the problem solving skills of students who are taught by the problem-based learning model is better than students who are taught with Conventional learning in physics learning. Based on the data obtained from the research results in testing the research hypothesis can be put forward:

1. The Influence of Problem Based Learning Model to Student Science Process Skill is Better than Student Group Learned by Conventional Learning.

This better result occurs because the learning process with the PBL learning model of the students play an active role in conducting an investigation of authentic problems. In conducting the investigation students are experimenting more. The PBL model is derived from learning theory that learning is the process by which learners actively construct their knowledge and is one of the learning models designed primarily to help students develop their thinking skills, problem-solving skills and intellectual skills, learn the roles of adults by experiencing them in various situations Real or simulated situations and become independent and autonomous students.

Learning begins after students are faced with the daily problem structure that is around students in this way students know why students learn, problem-based learning requires students to conduct authentic investigations to seek real solutions to real problems. They must analyze and identify problems, develop hypotheses and make predictions, collect and analyze data and information, conduct experiments (if required), and formulate conclusions.

The student activity sequence becomes a personal experience that has its own impression. The knowledge that students gain directly will be easier to remember than the knowledge given by the teacher. From his own experience students have built a personal concept (self-concept) in his thinking. So when students face similar / identical problems in learning such as answering questions or in their daily life, they can use the concept in solving problems. The students 'success in solving the problem positively impacts the students' SPSs through PBL learning process. While in the control class, because they have the freedom to inquire directly with the teacher, the student so chooses to ask directly and not to experiment effectively with a group of friends..

In addition, the third phase of the PBL learning model is to assist independent and group investigations to direct students to gather information on the problems provided by teachers by carrying out actual or mental experiments until they fully understand the dimensions of the problem situation. After collecting enough data then students will offer hypotheses, explanations and solutions. In this phase the SPS indicator is to build basic skills and conclude to be honed. During the process of independent investigation and group of critical thinking processes will be formed because students will make observations of experiments conducted then record things gained during the experiment. After that students must find a solution to the problem of the findings while experimenting this forces students to not only think, but more than that is thinking about abstract and complex ideas. While in the control class that is taught by conventional learning the students learn by listening more to the teacher's explanation in front of the class and performing the task of the teacher if giving practice questions or homework to the students. It clearly shows that the dominance of teachers in teaching is so great that the role of teachers greatly affects the success of students achieved.

SPS students on PBL learning model caused students to be skilled and more thorough in analyzing a problem, the ability to express ideas / ideas in groups and between groups. While in the control class, because they have the freedom to inquire directly with the teacher, the students prefer to ask directly and do not have an effective discussion with their group of friends. This is in line with research conducted by [8] indicating that differences in the science process skills between groups of students who are learning by using model of problem-based learning model with group of students learning by using direct learning model. This is similar to the results obtained by the researchers that there is a difference in the average score of science process skill of problem-based learning groups and groups of direct learning. Hanafiah [14] research results states that the problem-based learning model has an effect on student SPS. This is in accordance with the results obtained by researchers that the problem-based learning model improves student's SPS. This is similar to the result obtained by the researcher that there is difference of mean score of science process skill of problem based learning group and group of direct learning. Ozgelen [3] suggests that the experimental group students has a higher mean score compared to control group students in science process skills in post-test science process skills. Juliawan [15] in his research shows that there are significant differences in science process skills between students who follow the problem-based and conventional learning model. In a study conducted by researchers by looking at the increase with the average value of the class that uses model learning problem based learning model with direct learning groups. Wahyudi [16] in his research said that problem-based learning has a significant effect on student science process skills. This is in line with research conducted by researchers that analyzed the improvement of critical thinking skills in

the control and experimental class Based on the results of research from some previous researchers, it can be seen that the research has not used n-gain in looking for improvement of student's SPS but looking from the result of posttest of students, while research conducted by researchers have used n-gain analysis to see the improvement of student's SPS.

2. Gain of Problem Solving Ability of the students taught by Problem Based Learning Model is better than the students taught by conventional learning

The findings in this study indicate that the mean value of problem solving of the students taught by PBL model in experiment class when pretest 32.22 with deviation standard 7.62 while at posttest equal to 70.97 with standard deviation 5.32. The mean value of problem solving taught by conventional learning during pretest is 25.97 with deviation standard 7.59 while at posttest equal to 54.84 with standard deviation 4.01. While the mean of student's SPS gain learned by PBL learning model in experimental class 0.59 in medium category is better than class that is taught by conventional learning 0.27 in low category. Thus the skills of the science process students are taught with PBL model better than students taught by conventional learning.

Based on the results of the analysts of each problem-solving indicator obtained at the focus stage of the problem, explaining the problems in physics, planning solutions, implementing the solution plan and evaluating the solutions taught by the PBL learning model and conventional learning have different results.

First on the focus stage on the problem. In this step, visualization of problems from words to visual representations, making a list of known and unknown variables, identification of basic concepts. Students who are taught by PBL are easier to understand by combining the ability of the student's initial concept through the formulation of the problem to be developed towards the actual problem with different understandings and lead to varied answers. Unlike students who are taught with conventional learning where the interaction of learning tends to one direction from teacher to student so that student initiative in understanding new things outside than presented by teacher becomes difficult to be developed.

Second, at the stage of explaining the problem in physics. In this step the visual representation is converted into a physics description by making free-body diagrams and selecting coordinate systems, or sketching. Students who are taught by PBL more easy interpret the problem by making a diagram sketch so as to direct the problem to the physics concept faster because in the learning model PBL familiarize the students oriented to the problem. Unlike students who are taught with conventional learning where the ability to interpret problems is not familiarized during the learning process takes place.

Third, in the planning phase of problem solving, that is planning the solution by changing the description of physics into a mathematical representation. In the PBL learning model at the stage of inquiry diamna students have been accustomed to obtain authentic data and then students process the data. This activity will familiarize the students to make careful planning ie the investigation where and where ends. In contrast to students who are taught with conventional learning where abstract planning abilities without authentic investigation deliberations.

Fourth, at the stage of implementing the solution plan, implement the solution plan by performing mathematical operations. This activity is done to process data from the results of the investigation through mathematical equations through physics concept

Fifth, at the evaluating stage of the solution. Evaluating the solutions obtained by checking the completeness of answers, marks, units and values by comparing or adjusting answers obtained to the concepts of physics, among others, by adjusting the answers to the constants, principles, laws, theories and general provisions that have been obtained through previous research

The steps of problem-solving skills with the method are a series of systematic and integrated activities from start to finish. If in the early stages cannot run well then automatically in the next stage will reap trouble. This is what distinguishes the problem-solving skills learned by the PBL learning model and conventional learning.

Heller [6] state PBL learning model is an independent learner development effort, its method requires the active participation of students in problem solving activities. Students actually have a sense of want to know and a great desire to grow. The PBL learning model utilizes the exploration of the students' natural passions to give students specific directions so that students can explore new fields effectively.

According to [7], PBL has the expected instructional impact is to help students develop critical thinking skills, problem-solving abilities and intellectual abilities, and to learn the roles of adults by experiencing them through real situations or simulated situations by becoming autonomous and autonomous students. PBLs involve students in an active, collaborative, student-centered learning process that develops the problem-solving and self-learning skills needed to meet the challenges of life and careers. PBL can also be started by doing group work among students. Students investigate on their own, find problems, then solve the

problem under the guidance of the facilitator (teacher). PBL advises students to seek or determine relevant sources of knowledge.

This is in line with research states that problem-solving abilities of students learning to use problem-based learning models are better than conventional learning. Students who are taught by PBL models have a high degree of independence compared to students who are taught by conventional models. But in the research have not analyzed gain of student while research conducted by researcher have analyzed gain of student to see model influence to student problem solving ability.

Increased student problem solving abilities on the PBL learning model is also caused by the students in the process of learning to be more creative to have a high sense of wanting because during the learning process students presented the authentic problems stated that the curiosity will improve Students' physics problem solving skills. This happens because students who have above average intelligence will assume that a problem as an opportunity to achieve goals, students will not easily give up until students are able to solve the problem given. But the research has not analyzed the gain of the students in the discussion while the research conducted by the researcher has analyzed the student gain to see the effect of the model on student problem solving abilities. That students in the experimental group h better problem-solving skills than those who were not treated for the PBL approach. Significant difference in the experimental group compar with the control group on the perception of problem-solving skills if, centered on students, who develop the problem-solving and self-learning skills needed to meet the challenges of life and careers. PBL also be started by doing group work among students. Students investigate on their own, find problems, then solve the problem under the guidance of the facilitator (teacher). L advises students to seek or determine relevant sources of knowledge. This is in line with research states that problem-solving abilities of students learning to use problem-based learning models are better than conventional learning. Students who are taught by PBL models have a high degree of independence compared to students who are taught by conventional models. But in the research have not analyzed gain of student while research conducted by researcher have analyzed gain of student to see model influence to student problem solving ability. Increased student problem solving abilities in PBL learning model is also caused by the students in the process of learning to be more creative to have a high sense of wanting because during the learning process students presented authentic problems as found that the curiosity of tau will improve students' physics problem solving abilities. This happens because students who have above average intelligence will assume that a problem as an opportunity to achieve goals, students will not easily give up until students are able to solve the problem given. But the research has not analyzed the gain the students in the discussion while the research conducted by the searcher has analyzed the student gain to see the effect of the model on student problem solving abilities. Students in the experimental group ha better problem-solving skills than those who are not treated by the PBL approach. Significant differences in the experimental group compared with the control group on the perceptions of problem solving skills which concluded that despite different students' abilities, but when treated with PBL, students will experience improvement in their problem-solving abilities . Research conducted by [17] suggests that physics students with low-level skills taught with learning-based problems are significantly better than students taught by conventional models. Students are more creative with problem based learning model in increasing their thinking ability compared to traditional class like class with conventional learning. Then In line with research explains that there is an interactive influence between the model and setting learning to understanding the concept and problem-solving abilities. [8] States there are differents in problem-solving abilities between groups of students who learn by using problem-based learning model (problem based learning) with groups of students learning by using conventional learning.

Based on the result of research from several previous researchers, it can be seen that the research has not used n-gain in seeing improvement of problem solving ability of students while research conducted by researchers have used n-gain analysis to see the improvement of problem solving ability of students. This is in line with the research stated that With the implementation of the PBL learning model attempted to instill the basics of scientific thinking in the students because in the learning process the students learn more on their own so that students become more creative in solving problems. While in the control class, because they have the freedom to inquire directly with the teacher, the students prefer to ask directly and do not have an effective discussion with their group of friends.

Despite different student abilities, however when treated with PBL, students will experience an increase in their problem-solving abilities. Research conducted by Destianingsih [17] suggests that physics students with low-level skills taught with learning-based problems are significantly better than students taught by conventional models. That class students are more creative with problem based learning model in improving their thinking ability compared to traditional class like class with conventional learning. Then In line with research explains that there is an interactive influence between the model and setting learning to understanding the concept and problem-solving abilities. Suardani [8] states there are differences in problem-solving abilities between groups of students who are learning by using problem-based learning models with groups of students learning by using conventional learning.

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This is in line with the research stating that with the implementation of the PBL learning model attempted to instill the basics of scientific thinking in the students because in the learning process the students learn more on their own so that students become more creative in solving problems. While in the control class, because they have the freedom to inquire directly with the teacher, the students prefer to ask directly and do not have an effective discussion with their group of friends.

IV.   CONCLUSION

Skills of students' science processes taught with problem-based learning model is better than students taught by conventional learning in physics learning.

Problem solving skills of students who are taught with problem-based learning model better than students taught by conventional learning.

V.   SUGGESTION

For the next researchers should better understand the problem-based learning model to maximize learning achievement, and attention to the availability of time and classroom used in implementing learning so that the implementation of learning can be arranged in such a way that the learning can take place effectively, the atmosphere conducive and effective and efficient.

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