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Effect of Learning Model *Problem Based Learning* Assisted LKPD of Competence To Learn Biology Students Class XI SMA State 12 Padang

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ABSTRACT

This study begins with the learning outcomes of students is still low. Factors that cause low learning outcomes of learners such as the selection of less precise learning models. The authors get a picture of the observation that the process of biology learning in schools has not been as expected where the implementation of learning is not a student center and still focused on the teacher as a source of information so that learners receive whatever given by the teacher. In addition, when the teacher explains in front of the class there is no feedback from learners, the learners are not focused and less active, the learning takes place when the learner appears to be talking to each other students. So they seem not to follow the course of learning. This is seen when the teacher asks a question, which answers only one or two learners. This research includes quasi-experimental research (Quasi Experimental Reasearch). In this design the learners' samples are grouped into two classes: the experimental class and the control class. Sampling was done by using purposive sampling technique and got class XI IPA 2 as experimental class and class XI IPA 5 as the control class. The instruments used are objective tests and observation sheet. Data analysis techniques to test the hypothesis are the t-test for cognitive domain competence and Mann-Whitney U test for the competence of affective and psychomotor spheres. Based on the analysis of the data and discussion, Obtained in the form of Conclusions items, namely: cognitive, affective and spikomotor student learning competencies that follow the learning of Problem Based Learning assisted LKPD better than students who follow the conventional learning with the average value of experimental and 87.7 cognitive control class class 80.35, 79.93 affective class experimental class and control class 71.76 and the mean value of psychomotor class gutter 65.28 experimental class and control class 46.94.

Key Words: Problem-based learning, LKPD, competence

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INTRODUCTION

Learning as specified in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 103 of 2014, is a process of interaction between learners, learners with educators and learners with learning resources in a learning environment , Learning activities is an educational process that provides an opportunity for learners to develop their potentials to capabilities that are increasingly rising in the attitudes, knowledge, and skills to live in a society, nation, and contribute to the welfare of mankind (Suharno, 2014: 148). This process is applied to the current curriculum, the curriculum of 2013. The 2013 curriculum is designed based on the culture and character of the nation, based civilization, and based on competence, qualification competence of learners in the curriculum in 2013 is listed in the competency standards pertaining to the competency of attitude,

knowledge and skills. Learning on the curriculum in 2013 using a scientific approach (Permendikbud, 2014: 4). Learning approach to scientific is a learning process that is designed so that learners actively construct the concept, law or principle through stages observe, formulate problems, propose or formulate hypotheses collect data with a variety of techniques, to analyze data, draw conclusions and communicate the concept, laws or principles found (Machin, 2014: 28).

Biology as one of the branches of science, providing a variety of learning experiences to understand the concepts and processes of science. Biology as science process skills include observing, asking questions, classifies and interprets the data, and communicate the results orally or in writing, digging and sifting the relevant factual information to test ideas or solve everyday problems. According to the Ministry of Education (2006: 451), one of the goals of biology is to develop analytical thinking skills, inductive, and dedukatif using concepts and principles of biology to solve problems related to the events surrounding nature.

Teachers as one component of learning has an important role in improving the quality of education. Teachers are required to play an active part and be professional in performing their duties as an educator, because all the teacher during the learning can affect learners in understanding the subject matter. Teachers should be able to select and define the learning model is considered the most appropriate and effective for the learning process interesting and fun. However, to create an interesting learning process and meyenangkan not be separated from the problem of learning.

Based on observations made in class XI SMA Negeri 12 Padang, the study of students still under the KKM set is 80, this can be seen in Table 1.

Table 1. Nilai average Mid Semester Exam Results Subjects Biology Class XI IPA SMA 12 Padang in the school year 2016/2017

No.	Grade	Number of students	Percentage of learners who are not reached KKM	percentage of students who reached KKM	Value average Class
1	XI science1	32	14%	86%	80
2	2XI,	32	93 8%	6.2%	60.8
3	XI IPA3	32	87.5%	12.5%	64.0
4	XI4	32	58.1%	41.9%	73.9
5	XI5	32	93.6%	6 2%	60.2
6	XI 6	32	55.1%	44.9%	75.9

Source: Biology Teacher SMA 12 Padang School Year 2016/2017

The data imply that the study of students is still low. One of the factors causing low learning outcomes of students include learning model selection is not right. Researchers get an overview of the observation that the learning process in the school biology does not meet expectations which in practice is not yet learning *students centers* and are still focused on the teacher as resources so that learners accept whatever is given by the teacher. In addition, when the teacher explained to the class there is no feedback from learners, learners are not focused

and less active, learning takes place when the learner seems no one is talking fellow learners. So that they are impressed not follow the path of learning. This can be seen when the teacher asked a question, the answer is only one or two students.

As the main controller in the PBM, teachers demanded to solve the problem. One effort that can be done is by implementing a teacher in the learning process so that the model can improve the competence of learners. In the curriculum in 2013, there are three models recommended one of them is a model *of Problem Based Learning.*

Learning model *Problem Based Learning* can improve the competence of learners. This is in accordance with the opinion of Sanjaya (2009: 221) one of the advantages of learning model *Problem Based Learning* is to help learners how to transfer their knowledge to understand the problem in real life and can develop the ability of students to think critically and develop their ability to adjust with new knowledge. Problem based learning is an instructional model that presents a contextual problem that stimulates learners to learn. PBL learning approach makes the students work in teams to solve real-world *problems.* According to Dewey (in Trianto, 2014: 64), learning by problem is the interaction between stimulus and response is the relationship between the two directions, learning and the environment. Environment provide feedback to students in the form of aid and problems, while the nervous system of the brain function effectively interpret the aid so that the problems encountered can be investigated, assessed, analyzed, and sought to solve well. It can be concluded that by using the learning model can improve thinking skills and learning outcomes of students.

In addition to learning models, learning resources also have an important role that can optimize learning outcomes of students. Worksheets learners (LKPD) is a learning resource that can be used by learners in the PBM, because LKPD consists of activities which contains the steps to complete a task with clarity the basic competencies that must be achieved. LKPD role learners add to the understanding of the material and enable learners. In the LKPD tasks can be done alone or discussed in the group (Prastowo, 2013: 204).

LKPD usage is expected to help learners understand the subject matter, especially for biology. LKPD used as one optimal media involvement and active learners in learning. LKPD can guide learners to undertake activities related to learning with the aim of learners more easily understand the subject matter.

Based on the above, the research is Influence Learning Model *Problem Based Learning* Competency Learning assisted LKPD against Biology learners Grade XI IPA at SMAN 12 Padang.

MATERIAL AND METHODS

In accordance with the problem and research objectives, the type of research is experimental research. This type of research that will be done is experimental research, this study included a quasi-experimental study *(Quasi Experimental* Research). In this design the

students are grouped into two classes, namely samples of experimental classes and control classes. Experimental class is a group of students who will be learning with models *PBL* and the control class is a group of learners who will be learning with conventional models. The design used is *purposive sampling.*

RESULTS AND DISCUSSION

Data description cognitive domains: Data cognitive competence in this study was obtained through the final test in the form of a written test in the form of multiple choice questions given to the experimental class and control class at the end of the meeting the learning process. The research data cognitive learning competencies of learners are presented in Table 2.

Table 2. The average value, maximum value, minimum value, standard deviation, normality test, homogeneity test Experiment Class and Cognitive Control In the Realm.

No.	Parameter	Treatment Description		
		Experiment	Control	
1	N (Number of Students)	32		
2	average	87.7	80.35	Experiment > Controls
3	X_{Max}	100	89.91	Experiment > Control
4	X_{Min}	75.93	66.6	Experiment > Control
5	S	6.34	6.27 to	
6	Normality Test	P = 0.200	P = 0.056	Normal
7	Test Homogeneity	0.486		Homogeneous

Based on Table 16, it can be seen that the average cognitive learning competencies of learners biology experimental class is higher than the control class, value experimental class average was 87.7 and the control class 80.35.The highest value of the experimental class is 100 whereas the control group was 89.91.The lowest value in the experimental class is 75.93, while the control group was 66.6.The full details are in Appendix 14. In both classes normality test sample normal distribution and homogeneity for both classes of homogeneous samples.

Affective domains data description: Data research on affective aspects obtained through observations made by the observer using the format affective ratings of learners during the learning process. Analysis of the data on the affective performed with nonparametric tests that *Mann-Whitney U*test.affective competencies research data are presented in Table 3.

Table 3. The average value, maximum value and minimum value of the Class Experiment and Control Class aspect Affective Competence.

Class	N	average	X_{max}	X_{min}
Experiment	32	79.93	100	64.44
Control	32	71.76	77.78	66.67

Based on Table 3 it can be seen that the total value of the affective learners are assessed by observation by the observer sheet, flat -rata class experiments using model *Problem Based learning* is higher than the average grade control with conventional learning models.

Psychomotor domains data description: Psychomotor research data obtained through observation during the learning takes place, ie during the discussion. The research data on psychomotor aspects obtained through observations made peers as observer by using the format psychomotor assessment of learners during the learning process. Analysis of the data on psychomotor tests performed with the nonparametricie. *Mann-Whitney U test*psychomotor competency research data are presented in Table 4.

Table 4. The average value, maximum value and minimum value of the Class Experiment and Control Class aspect Psychomotor Competency.

Class	N	average	X_{max}	X_{min}
Experiment	32	65.28	71.11	60
Control	32	46.94	53.33	40

Based on Table 4 can be seen the highest value, lowest value, and the average of the experimental class is higher than the control class. The highest value domain Psychomotor the experimental class is 71.11, while the control group was 53.33.The lowest value psychomotor experimental class is 60,while the control group was 40.

Testing Requirements Analysis: Test requirements analysis carried out before proceeding to the hypothesis test, the first test is conducted using test for normality *Klomogrov Smirnov* and homogeneity of variance usingtest *Levene* with *SPSS.* Normal distribution of data and hence homogeneous hypothesis testing using t test. if it is not normal, it will not proceed with the test of homogeneity of variance and hypothesis testing using *the Mann Whitney U* test.

Normality Test: Normality test on the value of cognitive competencies carried out on test average KD KD 3:12 and 3:13 learners experimental class and control class, while for the competence afiktif and psychomotor done against the average value of observation for five meetings. Normality test is done usingtest *the Kolmogorov-Smirnov* with *SPSS.* The test criteria are accepted H_0 if sig. > Level ($\alpha = 0.05$). The complete statement can be found in Appendix 17. Results of this normality test calculations are presented in Table 5.

Table 5. Results Normality Test of Cognitive Learning Competency DomainsLearners

Class	**CompetencyLearners Cognitive Learning Sphere**	
	Sig	**Description**
Experiment	0.200	Normal
Control	0.056	Normal

Variance homogeneity test: Test homogeneity of the final test score KD graders both experimental and control classes usingtest *Levene* with SPSS. Testing criteria are accepted H_0 if the sing. > Level ($\alpha = 0.05$), and $H_{0\ is}$ rejected otherwise. The complete statement can be found in Appendix 18. The result of this homogeneity test calculations are presented in Table 6.

Table 6. Results Homogeneity Competency Test Students Learning

Classroom	Learning Competencies Learners Cognitive Domains	
	Sig	Specification
Experiment Control	0.486	HomogeneousVariance

From the calculation results in Table 6 show that the competence of learners in the cognitive domain has a sig 0.486 so that it can be concluded that the data are homogeneous.

Hypothesis Testing. Hypothesis testing is done in order to see whether there are differences in the attainment of good learners the cognitive, affective and psychomotor. Hypothetical calculation results can be seen in Table 7. The details are in Annex 19, 20 and 7.

Table 7. Calculation Results Hypothesis

Hypothesis	**Class**	**Sig**	**A**	**Conclusion**
FirstHipoteis	Experiments Control	0,000	0:05	$H_{0\ is}$ rejected
second hypothesis	Experiment Control	0,000	0:05	$H_{0\ is}$ rejected
Hypothesis third	Experiment Controls Controls	0,000	0:05	$H_{0\ is}$ rejected

First hypothesis: Testing this hypothesis is used to determine the competence of cognitive learning learners who follow the teaching model *Problem Based learning* is better than the competence of cognitive learning learners follow conventional teaching, because the data were normally distributed and have homogeneous variance, the test used was t test. Table calculation results show that cognitive learning competencies students have the price of the Sig. of 0000 with a real level = 0:05. This means that the value of Sig. <0.05 then$_{H0}$ is rejected. Thus it can be concluded that there is significant influence learning model *Problem Based Learning* for the competence of learners' cognitive learning and cognitive learning competence of learners who follow the teaching model *Problem Based Learning* is better than cognitive learning competence of learners who follow conventional teaching. This calculation can be found in Appendix 19.

Second hypothesis: Testing this hypothesis is used to determine the competence of learners' affective learning that follows the model of learning *Problem Based Learning* is better than studying affective competencies learners who follow conventional teaching. Data affective competencies have characteristics that the calculated results are not found fractions (nominal data), then immediately analyzed using non-parametric statistics. Test used *Mann Whitney U* test.

Table calculation results show that the sig. <0:05 namely 0000 obtained from the analysis using SPSS. Thus it can be concluded that there is significant influence learning model *Problem Based Learning* to learn competence learners affective and affective learning competencies of learners who follow the model of learning *Problem Based Learning* is better than learning competencies affective learners who follow conventional teaching. The result of this calculation can be found in Appendix 20.

Third hypothesis: Testing this hypothesis is used to determine the competence of learning psychomotor learners who follow themodel of learning *Problem Based Learning* is better than learning competencies psychomotor learners who follow conventional teaching.

Data psychomotor competency has a characteristic that the calculated results are not found fractions (nominal data), then immediately analyzed using non-parametric statistics. Test usedtest. *Mann Whitney U*Table calculation results show that the sig. <0:05 namely 0000 obtained from the analysis using SPSS. Thus it can be concluded that there is significant influence learning model *Problem Based Learning* to learn competence psychomotor learners and psychomotor learning competencies of learners who follow themodel of learning *Problem Based Learning* is better than learning competencies psychomotor learners who follow conventional teaching.

Achieving competence study on cognitive domains: The results showed that cognitive learning competence of learners can be increased by using model *Problem Based Learning* is given in the form of a group discussion. *Problem Based Learning* to give effect to the learners' cognitive competence, which gained an average value of 87.7 experimental class learning outcomes and control class 80.35, the average of the learners can be seen that the value of the two classes of samples experience the difference.

Based on the analysis of the data that the experimental class were treated by using model *Problem Based Learning* higher learning results compared to the control class that uses conventional learning models. This is because the learning model *Problem Based Learning* is a learning model that presents a contextual matter, thus stimulating students to learn to solve problems and to train students to think and use reason and to train students to learn independently so that the learning process meaningful memnjadi. This is in line with the results Wahyudi (2015: 7) the results of his research stating that the implementation of the learning model *Problem Based Learning* has a positive impact on the achievement of learning outcomes of students, learning is a process of self-learning, learners are exposed to the environment in which to think and using reasoning thus creating an atmosphere that is

meaningful. Learners do not just accept the material but can make their own understanding of the material.

The learning process inmodels *Problem Based Learning* assistedwith less LKPD which is one form of exercise independently provided, which can be used to attract the attention of students to think critically and understand the concept. In the experimental group LKPD given to each learner, LKPD used according to the learning model used is based on *Problem Based*Learning.In the control class LKPD used LKPD provided by the school. LKPD used by the experimental class contains authentic problems and questions related to learning materials. This facilitates students in group discussions and cooperation with each group, as well as making them more active in learning.

Learning model *Problem Based Learning* is believed to improve the competence of learners for the learning model *Problem Based Learning* can train students to work together and exchange ideas in the learning process so that students more easily understand the material.

CONCLUSIONS

Learning competency achievement in the sphereof affective of competence observations affective learners performed by the observer, data showed that affective competencies learners experimental class significantly better than the control class afektfi competence. Affective competence of students in the experimental class as a whole possesses both criteria. Learners experimental class largely willing to listen to the teacher's explanations seriously, carrying out individual tasks well, do not cheat, work together in a group discussion with either or responsible for the task group assigned by the teacher, bold presentation to the class, ask questions or answer questions and respond to other friends who found each other and did not drop a friend, and was active in the filed of opinion with arguments based on the right. Learning competency achievement in the sphere psychomotor of competence psychomotor observations learners performed by observer, data showed that the competence of psychomotor learners experimental class significantly better than learners' competence psychomotor control class. Competence psychomotor learners experimental class as a whole possesses both criteria.

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