
**THE EFFECT OF PROBLEM BASED LEARNING MODEL WITH CONCEPT MAP ON
PROBLEM SOLVING IN SOCIAL SCIENCE LEARNING OF THE FOURTH GRADE
STUDENTS SD NEGERI 189 PEKANBARU**

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Abstract

This study aimed to determine the effect of Problem Based Learning model with Concept Map on the problem solving skill in social science learning of the fourth grade students SD Negeri 189 Pekanbaru. The type of research used was pre-experimental with a pretest-posttest one-group design. The dependent variable in this research was problem solving ability in social science learning and the independent variable was problem based learning model with concept map. The subjects of the study were the fourth grade of SD Negeri 189 Pekanbaru, amounted to 36 students. The data collecting techniques in this research was test. Data analysis technique used descriptive statistical analysis with the assistance of SPSS program for windows 23. The result showed that problem based learning model with concept map had an effect on problem solving skill in social science learning. Students' average pre-test score was 39.09 which increased in the post-test score of 62.15. Based on t-test result, it showed that $t_{\text{calculate}}$ value was $43.658 \geq t_{\text{table}} -2.030$ and significance value of $0.000 < 0.005$. This means that problem based learning model with concept map has significant effect on problem solving ability in social science learning.

Keywords: Problem based learning , concept map , social science

INTRODUCTION

Based on the research results, student low learning outcome is caused by the dominance of conventional learning process (Trianto, 2009, p.6). In the conventional learning process, where the teacher still delivers the material directly without involving students, students look passive to the material provided by the teacher. This learning situation is still in the form of teacher-centered. In the lesson, the students are not taught how to solve problems.

SD Negeri 189 Pekanbaru Riau province is one of the State Primary Schools which has strategic location because it is situated in urban area. Based on the observation in terms of facilities and infrastructure, SD Negeri 189 Pekanbaru Riau has already had adequate learning facilities both from the library and other supporting facilities. Teachers at SD Negeri 189 Pekanbaru Riau province basically have been trying to involve students actively in social science learning through tasks given by the teachers. However, the learning model is still less innovative and monotonous.

The result of observation and interview about the process of teaching and learning activities conducted by teachers in the fourth grade of SD Negeri 189 Pekanbaru Riau province, the learning process was still using conventional learning pattern,

teacher-centered, and less exploring to students. Learning is dominated by lecturing and question and answer method which still dominated by the teacher. Lecturing method is a method that can not be separated in a learning activity because teacher directs learning steps to the learners. However, it should not be dominated by lecturing method because it will cause students to become passive and not actively involved in learning.

In teaching and learning process of SD Negeri 189 Pekanbaru Riau, it is shown the lack of the use of learning model which encourages students' ability in problem solving . In social science lesson, the activity is not only about memorizing the concepts related to social life, but also providing basic skills for logical and critical thinking. One of which is the ability to solve problem (Sapriya, 2009, p.194) . As explained and argued above that social science learning is not merely transferring knowledge, but also helping students to develop various aspects of basic skills, especially the ability to think in solving problems.

According to Joyce and Weil (Agus Suprijono, 2009, p.46) on the function of learning model mentioned that through teacher learning model can help learners in obtaining information, ideas, skills, and way of thinking and expressing an opinion. For

that we need a learning model which can improve the ability of learners, especially in terms of problem solving. Constructivism model is a learning model which is considered to develop the ability to solve the problem, because with this learning model students actively build their own knowledge and expected to be more meaningful.

One of the constructivist learning model which is considered appropriate to develop problem solving is Problem Based Learning (PBL) model. Woods (2013) stressed that in Problem Based Learning, learning objective can be developed by the teacher or by students themselves. It will encourage students to use the knowledge they already have and look for what needs to be known to solve the problem.

Learning which begins with a problem will change the learning which has been centered on the teacher being centered on the learner. In the learning process students only receive material from the teacher. Learning which only recording and memorizing transforms into learning which seeking and finding the knowledge so that there is increasing understanding of the material learned by the students. This learning provides an active learning condition to learners through solving a problem, where students learn the knowledge of the given problem.

Conny (in Sitorus, 2010, p.54) stated that one principle of enabling learners in learning is the principle of learning while working. Problem Based Learning will lead students to understand the concept of learning materials starting from learning and working on problem situations which are given at the beginning of learning. So that students will have freedom to think and find a solution of the problem given. Through learning experience from working, searching, and finding by themselves will not be easy to forget. Problem Based Learning model can be applied to IV class of primary school subjects especially on technology development and transportation material because it is conceptual and factual material.

The implementation of Problem Based Learning model on technology development and transportation will be more effective when using concept map. Concept map is visual aids to show the relationship between several concepts. The relationship between concepts can be detailed in the form of statements. Dahar (2011) pointed out that concept map is used to express the meaningful relationship between concepts in the form of propositions. Propositions are two or more concepts connected by words in a semantic unit. In its simplest form, a concept map consists only of two concepts connected by a single link to form a proposition.

In connection with the above description and problem, it is deemed necessary to conduct a research on the effect of problem based learning model with concept map on problem solving in social science learning.

So the research question is “How is the effect of Problem Based Learning model with concept map on problem solving skill in social science learning in fourth grade students of SD Negeri 189 Pekanbaru Riau?”

The concept map is a visual image composed of interrelated concepts as a result of concept mapping. The concept mapping here is a process which involves identifying such concepts in a hierarchy from the most inclusive to less inclusive after which the more specific concepts. Concept mapping is one way to actuate concepts which have been obtained and its relationship. Dahar (2011), suggested that concept map is used to unify meaningful relationships between concepts in the form of propositions. Propositions are two or more concepts which are expressed by the words in a semantic unit. In its simplest form, a concept map consists of only two concepts connected by a single link to form a proposition.

Before explaining the notion of problem solving, it will explain the understanding of the problem itself. According to Faisal (2009, p.8), the definition of problem is “ it is realized to have a willingness and feel the need to take action to overcome and not immediately be found how to cope with the situation”. Based on the above opinion of the problem, then it can be said that a certain situation can be a problem for certain people, but not necessarily problem for others.

Social science is the study of social life. Through the subjects of social science, students are introduced to the various problems which exist in society and efforts to solve problems. According to Wayan Lasmawan (Zubaidi, 2011, p.291) in Social Science there are three competencies namely personal, social, and intellectual competence. Personal competence is concerned with the development of the personality of the self as an individual being. Social competence is concerned with consciousness as a social being.

Problem solving ability is one of three competencies owned by social science and is one of the subjects in primary school. Therefore, social science learning should teach various skills, especially problem solving skill.

RESEARCH METHOD

Research Design

This research used experimental method with pre-experimental design. In the experimental design,

control variable was not used so that the results are not solely influenced by independent variables.

Subject and Time of Study

In this study, the subjects used were the fourth graders of SD Negeri 189 Pekanbaru Riau. While the samples of this study were 36 students. This study was conducted \pm 1 month in the even semester in 2017/2018 academic year.

Data collection technique

In this study the researcher used data collection techniques in the form of a description test. The description test used was given twice for pretest and posttest. The pretest was given before the treatment while the posttest was given treatment by using Problem Based Learning model using concept map. From this test, it was obtained the students problem solving skill before and after the treatment given as a comparison so it could be known how the effect of treatment applied.

Operational Definition of Research Variables

Problem Based Learning Model is a learning model which requires optimum learners' activities in understanding the concept and gaining knowledge by referring to the learning steps, namely: (1) student's orientation to the problem, (2) organizing learners to learn, (3)) guiding individual and group investigations, (4) developing and presenting the work, and (5) analyzing and evaluating the problem-solving process. The concept map is an image (visual) composed of interrelated concepts as a result of concept mapping. Problem solving skills in this study is a way of learning by confronting learners to a contextual problem to be solved or resolved.

Data analysis technique

Data in this research were analyzed and presented in the form of tables and diagrams with descriptive statistical data analysis techniques. Descriptive statistical data analysis techniques were statistics used to analyze data by describing collected data without intending to make conclusions which apply to the public or generalization (Sugiyono, 2012: 207-208). In this research, the researcher was assisted by SPSS for windows 23 program in the calculation.

The first step to do in data analysis is to make a summary of data before treatment and after treatment. Description of data is done by calculating mean count, median value, mode, standard deviation, minimum value, and max value.

The next stage of interpretation of the score, ie to determine the subject into group categories. The

categorization system chosen was the categorization of the ladder with the aim of setting the subjects into groups which are separated in stages according to the size of the attributes measured (Saifuddin Azwar, 2010: 147).

RESULT AND DISCUSSION

Result

Initial test (pretest) is a test of students' problem solving skill in social science learning before treatment in the form of using Problem Based Learning (PBL) model with Concept Map. The results of pretest tests can be seen in table 1 below.

Tabel 1. Pretest Score of the Fourth Graders SDN 189 kota Pekanbaru

Data	No. of Students (n)	Mean (\bar{x})	Standard Deviation (s)	Min Value	Max Value
Pretest	36	39,09	8,087	25	57,5

Based on the above table, it can be seen that the average student before the treatment is 39.09. Maximum value is 57.5 and minimum value is 25, and Standard Deviation is 8.087. As for the data posttest can be seen in Table 2. below.

Tabel 2. Posttest Score of the Fourth Graders SDN 189 kota Pekanbaru

Data	No. of Students (n)	Mean (\bar{x})	Standard Deviation (s)	Min Value	Max Value
Posttest	36	62,15	10,507	40	92

Based on the above table, it can be seen that the average student after the action (treatment) is 62.15. The maximum value is 92 and the minimum value is 40, and Standard deviation is 10.507. The next step is to test the normality by using statistical test One Sample Kolmogorov-Smirnov with a significance level of 0.05. Normality test in this study using hypothesis as follows:

H_0 : the sample comes from a normally distributed population

H_1 : the sample comes from an abnormally distributed population

Testing criteria which is performed

If the value is Sig. (p-value) $< \alpha$ ($\alpha = 0,05$), then H_0 is rejected

If the value is Sig. (p-value) $\geq \alpha$ ($\alpha = 0,05$), then H_0 is accepted

Test of difference of average score in this research using Paired Sampel t-test. This test is

used to know the presence or absence of average difference between two groups of paired sample (related). The point here is a sample yet undergoes two different treatments. In this case the data used is data pretest and posttest to see whether or not the difference existed in the results of students' problem solving skills in social science learning.

The hypothesis in this test is as follows:

H0: There is no difference between average score of students' problem-solving skill before using Problem Based Learning (PBL) model using concept map and average score of students' problem solving skill after using Problem Based Learning (PBL) with concept maps.

H0: There is no difference between average score of students' problem solving skill before using Problem Based Learning (PBL) model with concept map and the average score of students' problem solving skill after using Problem Based Learning (PBL) with concept maps.

Testing this difference used SPSS 23 software with 95% confidence degree or error rate 5% (0.05). From the result of Paired Sampel t-test, it is found that the value of $t_{\text{calculate}}$ was - 43.658 when compared with t_{table} value - 2.030. Thus, $t_{\text{calculate}} > t_{\text{table}}$ can be interpreted that average score of student learning outcome is higher after using Problem Based Learning (PBL) with concept maps (Posttest) than before using Problem Based Learning (PBL) learning model with concept map (Pretest). The value of P value of T Paired test is 0.000 which means there is difference before and after treatment, because P value < 0,05. The mean data is in the negative sign -23.05 which implies that there is an increase in the average results of students' problem-solving abilities in the IPS lesson from Pretest to Posttest.

Based on the data above, it can be concluded that the hypothesis Ha is accepted and H0 is rejected. Hypothesis Ha is "There is a difference between the average value of problem solving skill in social science learning before using Problem Based Learning Model (PBL) with concept map with the average score of problem solving skill in social science learning after using the model of Problem Based Learning (PBL) with concept maps."

Hypothesis test in this research use simple linier regression analysis Test (t). Tests conducted to determine the effect of Problem Based Learning (PBL) learning model on problem solving in learning IPS grade IV SDN 189 Pekanbaru. The hypothesis proposed is as follows.

H0: There is no significant effect of using Problem Based Learning model to solve student problem in social science learning

Ha: There is significant effect on the use of

Problem Based Learning model of learning to solve student problems in IPS learning

This hypothesis is tested using SPSS 23 for Windows software. The analysis results can be known in Table 3 below.

Table 3. The Significant Effect of Problem Based Learning Model with Concept Map on Student Problem Solving Skill in Social Science Learning

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	9,641	2,043		4,720	,000
	Pretest	1,327	,051	,976	26,178	,000

a. Dependent Variable: Posttest

Based on the data of these processed products, it can be known that $t_{\text{calculate}}$ amounted to 26.178 with significance value of $0.000 < 0.05$. Then, it can be concluded that H0 is rejected and Ha is accepted. This means that there is a significant effect of using Problem Based Learning (PBL) model with concept map on solving students problem in social science learning. The value of correlation or determinant coefficient between the two data is 0.976 which means that there is a strong and positive effect between the two variables. The relationship significance level was 0.000 which means it is significant at the level of 0.01.

Discussion

Based on the data obtained, students' problem solving skill have increased after the implementation of Problem Based Learning (PBL) model with Concept Map. The average difference test results indicate that the $t_{\text{calculate}}$ value is - 43.658 when compared with t_{table} value amounted to - 2.030. Thus, $t_{\text{calculate}} > t_{\text{table}}$ can be interpreted that the average score of problem solving skill in the students' social science learning is higher after using Problem Based Learning (PBL) model with Concept Map (Posttest) than before using the Problem Based Learning (PBL) model with Concept Map (Pretest). P value of T Paired test is 0.000 which means that there is difference before and after treatment because P value < 0.05. The mean data is in the negative sign -23.05 which implies that there is an increase in the average of students' social science learning outcomes from Pretest to Posttest. The result of hypothesis test shows that $t_{\text{calculate}} = 26.178$ with significance value of $0.000 < 0.05$. Then, it can be concluded Ho is

rejected and H_a is accepted. This means that there is a significant effect of the use of Problem Based Learning (PBL) model with Concept Map to solve student problem in social science learning. The value of correlation or determinant coefficient between the two data is 0.976 which means there is a strong and positive effect between the two variables. The relationship significance level is 0.000 which means it is significant at the level of 0.01.

It can be interpreted that the use of Problem Based Learning (PBL) Learning Model with Concept Map gives a significant effect on solving student's social science problem when compared with data before using Problem Based Learning (PBL) Learning Model with Concept Map. Some of the things that make this learning model is very good in applied because the model can explore and train students ability in solving problems that can improve student problem solving skill. Also the implementation of concept maps on this model is a way to show the concepts and propositions of a field of study or a two dimensional image of a field of study or a part of the field of study, so that students do not occur misconception and also very helpful students in studying the basic concepts and propositions, as well as helping in connecting or mengatkan knowledge that has been with the already learned.

The learning process becomes more active than usual. Because of the interest of students on the application of learning models that researchers use in learning. Students have never learned to use learning models in their learning. Some things that make the model of Problem Based Learning (PBL) learning with concept map is very suitable applied because Problem Based Learning process is to explore and train students' skill in solving problems that can improve students problem solving skill. While the Concept Map here is to help PBL learning model that is functioning to avoid misconception by students on the material being taught. In addition, the concept map helps to understand the various concepts contained in the topic to be taught and gain new insights. Also it indirectly invites students to learn cooperatively. It is also very helpful in studying the basic concepts of propositions, as well assisting in connecting or linking knowledge which has been already learned. This is what makes the results of problem-solving skills in social science learning grade IV is improved after using Problem Based Learning (PBL) learning model with Concept Map in learning.

Based on the experiment in this study by using the design of one group of Pretest postes sample using Problem Based Learning (PBL) model with Concept Map proved to have a significant effect on the

improvement of problem solving ability of students. So that can be answered research hypothesis in this research is The existence of significant influence of use of Problem Based Learning (PBL) learning model with Concept Map to solving problem in IPS learning fourth grade student of SDN 189 Pekanbaru acceptable.

CONCLUSION AND SUGGESTION

Conclusion

Based on the results of research and discussion which has been presented, it can be concluded that there is an effect of Problem Based Learning (PBL) model with concept map on problem solving in social science learning in the fourth graders SDN 189 Pekanbaru, which can be seen in the data below.

1. The result of test difference of average score indicates that the $t_{\text{calculate}}$ value is -43.658 when compared with t_{table} value $-2,030$ thus it can be seen that $t_{\text{calculate}} > t_{\text{table}}$ can be interpreted that the average score of problem solving of students social science learning is higher after using Problem Based Learning (PBL) model with Concept Map (Postes) than before using Problem Based Learning (PBL) model with Concept Map (Prestes). The value of P value of T Paired test is 0.000 which means that there is difference before and after treatment, because P value is < 0.05 . The mean data is in the negative sign -23.05 which implies that there is an increase in the average results of students' IPS problem solving abilities from Pretes to Postes.
2. The result of hypothesis test shows that $t_{\text{calculate}} = 26.178$ with significance value $0.000 < 0.05$. Then it can be concluded H_0 is rejected and H_a is accepted. Which means that there is a significant effect of the use of Problem Based Learning (PBL) model with Concept Map to solve students social science problem. The value of correlation or determinant coefficient between the two data is 0.976 which means there is a strong and positive effect between the two variables. The relationship significance level is 0.000 which means it is significant at the level of 0.01.

Suggestion

Based on the conclusions of the research, the researcher wanted to convey the suggestion It is hoped that further researcher can develop this learning model to determine students' social skill or creative thinking.

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