

**PROBLEM SOLVING LEARNING APPROACH USING SEARCH, SOLVE,
CREATE AND SHARE (SSCS) MODEL AND THE STUDENT'S
MATHEMATICAL LOGICAL THINKING SKILLS**

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Abstract

The purpose of this research is to analyze the mathematical logical thinking skill who are taught by problem solving approach using search, solve, create and share (sscs) model and conventional learning and to analyze the difference mathematical logical thinking skill between students who are taught by problem solving approach using search, solve, create and share (sscs) and students taught by conventional learning. The research was conducted at SMPN 178 Jakarta. The method used in this research is quasi experimental method with Randomized Control Group Posttest Only design, involve 68 students as sample. The data collection after treatment conducted with test of the students' mathematical logical thinking skill. The result of research that the student's mathematical logical thinking skills who are taught by problem solving approach using search, solve, create and share (sscs) model is higher than students taught by conventional learning. This matter visible from the mean score of the results test students' mathematical logical thinking who taught with problem solving approach using search, solve, create and share (sscs) model is 70,09 and who taught with conventional learning have mean score of the test students' mathematical logical thinking is 54,91

Key words: Problem Solving Approach Using Search, Solve, Create and Share Model, The Student's mathematical Logical Thinking Skills.

INTRODUCTION

Reasoning and thinking ability of students Indonesia is still very low. Therefore, the low math skills of students in the domain penalaranyang also relates to the ability to think logically need to get perhatian. Sehubungan with the matter, the learning process should be improved. As it turns out the learning process is still lacking to encourage the development of thinking and reasoning of students as seen from the results of both these data. Logical thinking is the thinking according to a certain pattern so as to conclude that the results obtained by applying the argument on the premise. For the purposes of this study used the instrument to measure the ability to think logically with the indicators:

1. Identify relationships between facts in resolving the problem.
2. Solving problems by giving reasons.
3. Analyzing some cases given.
4. The conclusions.

Based on the learning theory proposed Gagne (Suherman, 2001), high-level intellectual skills can be developed through problem solving. This can be understood because the type of learning problem solving merupakan highest of the eight types Gagne proposed, namely: signal learning, stimulus-response learning, chaining, verbal association, discrimination learning, concept learning, rule learning, and problem solving. Thus in mathematical learning an effort to improve math logical thinking ability of students is the learning of mathematics through problem-solving approach (Problem Solving).

Pizzini (Irwan, 2011), proposed a model known as the phase of the search, solve, create and share (SSCS). The model was first introduced in 1987, includes four phases, the first phase of the search that aims to identify the problem, the second phase aims to solve that problem solving, create a third phase aimed at creating a product conclusion is the fourth phase of matter and share the aims to promote the settlement of the problems we do.

In this learning model students to think actively to solve a given math problems , find solutions to these problems by working together then able to deduce logically or results obtained from the solution of the problem with the argument of the rationale used . Thus this model merupakan an instructional model that involves problem solving thinking skills of learners . One model that can be used problem-solving approach is Problem Solving Model Search , Solve , Create and Share (SSCS) . This model was first developed by Pizzini in 1988 on the subjects of science (IPA) , the next Pizzini , Shepardson Abel and enhance this model and say that this model is not only applicable to science education , but also suitable for mathematics education . Learning activities with the model SSCS (Pizzini , 1991) begins with the provision of problems or conditions related to the material to be studied . Then students look (search) information to identify situations or problems presented , after knowing the problems faced by the students to make a hypothesis and then plan how to solve (solve) the problem , with the information and plans that have been prepared students , make (create) solution for later presenting it for discussion together with friends and teachers , students divide (share) knowledge of each other.

Based on the identification of issues and problems that have restrictions described above, the problem to be studied is formulated as follows:

1. How logical mathematical thinking skills students are taught problem solving approach using a model Search, Solve, Create and Share (SSCS)?
2. How logical mathematical thinking ability of students taught by conventional teaching?
3. Was mathematical logical thinking ability of students who received learning with problem solving approach using modelSearch, Solve, Create and Share (SSCS) higher than students who received conventional learning?

RESEARCH METHOD

This study uses a quasi-experimental methods (quasi-experimental) , in this study sample will be grouped into two and given two treatments of learning that the experimental group using the Problem Solving approach SSCS models and the control group was given conventional treatment . Experimental design used in this study form a randomized two- group posttest only means pengontrolan subjects randomized to the test only at the end of treatment . The population in this study were all seventh grade students of SMP Negeri 178 Jakarta semester academic year 2013/2014 . The sampling technique used was cluster random sampling technique . This technique took two classes from seven existing classes . Then drawn from the second class , the class which will be used as the experimental class and control , the elected class VII - 1 by the number of students as a class experiment 34 and VII - 2 with siswa number 34 as the control class.

The instrument used in this research is a matter of a test to measure students' ability to think logically from mathematical description of the problems as much as 7 items were given in the form of post-test . This test instrument is given in the experimental class and the control class on the subject of Social Arithmetic and Comparisons , where tests are given to these two classes are the same . Before the test items used , the instrument trial conducted to determine whether the instrument meets the requirements of validity and reliability , and also to determine the level of difficulty and distinguishing matter.

This study uses quantitative analysis . From the data obtained, we then calculate descriptive statistics to create a frequency distribution, the count mean, media , mode , variance, standard deviation, and the sharpness of the slope (kurtosis).

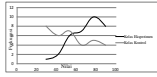
RESULT AND DISCUSSION

A. Result

Research on mathematical logical thinking ability of students is done in SMP 178 Jakarta , namely class VII - 1 as an experimental class and class VII - 2 as a control class . In this research, the experimental class consisted of 34 students taught by using the approach of Problem Solving Model Search, Solve, Create, and Share (SSCS) while the control class consisting of 34 students taught with conventional learning.

Here are presented the data on the calculation test students' ability to think logically after learning mathematics implemented.

Data results of tests students ability to think logically mathematical experimental class has the lowest value and highest value 24 and 95. A visual comparison of the spread of the data in the second class is a class that applied learning approach SSCS and Problem Solving class of models that conventionally applied learning can be seen in the diagram below.



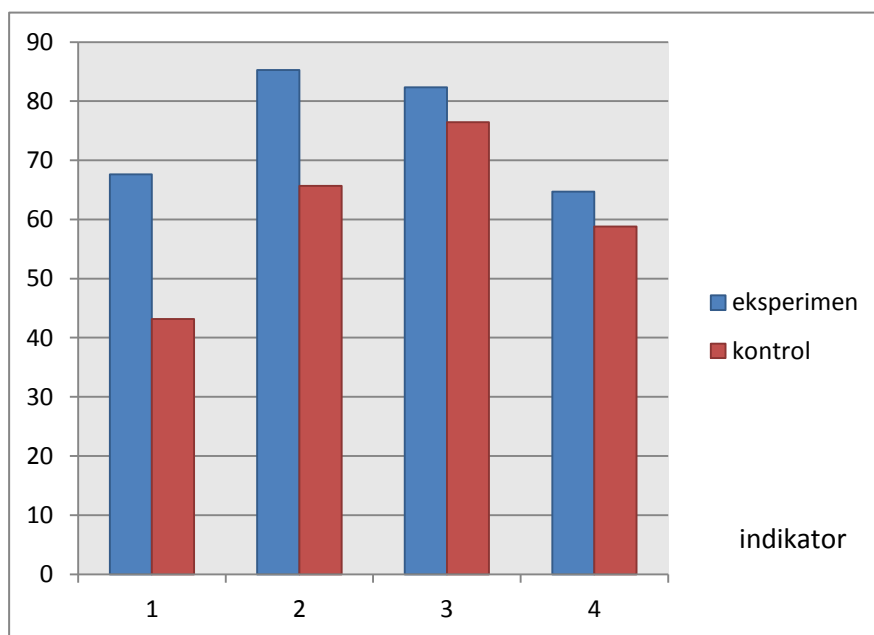
Gambar 4.1
Grafik Perbandingan Skor Kemampuan Berpikir Logis Matematik Siswa Kelompok Kontrol dan Kelompok Eksperimen

Mathematical logical thinking ability in this study was based on four indicators, including identifying and examining the relationship between the facts in resolving the problem, solve the problem by giving reasons, identify the problem by analyzing some case given and making inferences. Score logical mathematical thinking skills in the experimental group and the control group based on the indicators presented in the following table.

Each indicator has a score ideal logical thinking different. This is because each indicator is represented by a number of different questions. For the first indicator, namely the ability of students mengidentifikasi and examine the relationship between the facts in resolving the problem, represented by the 3 questions with a maximum score of each question is 3 so the ideal score per student for indicators tersebut adalah 9, while the ideal score of all students is 9×34 students = 306 dan kelompok kontrol for the experimental group. For other indicators the same as the first indicator calculation.

Students are able to achieve the first indicators that identify and examine the relationship between the facts in solving problems in the experimental group amounted to 67.65 % of all students in the control group, while fewer (43.14 %), meaning that students in the experimental group are better able to identify and examine relationships between facts in solving problems. For the second indicator, ie the student's ability to solve the problems by giving reasons, the percentage of the average score of the experimental class students at 85.29 % , this score is higher than the control class (65.69 %). The percentage of the average score for the experimental class students third indicator of 82.35 % , while the control class is 76.47 % . It shows that the experimental class students' ability to identify indicators of problems by analyzing some cases given a higher grade than the control .

Percentage of students the average score for the four indicators, namely the ability to make inferences experimental class was 64.71 % , while the control class is 58.82 % . This shows the experimental classes are better able to draw a conclusion from the given problem . More clearly the percentage of the average scores of students based on indicators of students' ability to think logically math class and grade control experiments presented in the following diagram :



Gambar 4.2
Persentase Skor Kemampuan Berpikir Logis Matematik Siswa Kelas Eksperimen dan Kontrol Berdasarkan Indikator Berpikir Logis

B. Disscusioan

After testing requirements analysis turned out to be normally distributed and homogeneous population . Hypothesis test . Testing was conducted to determine whether the average test students ' ability to think logically mathematical experimental group using the Problem Solving approach SSCS models is significantly higher than the average mathematics test students' ability to think logically control group using conventional learning . Tests performed by t-test .

After hypothesis testing is done , it can be concluded that the rejected , while acceptable . stated that the average logical thinking ability of students learning mathematical Problem Solving approach models SSCS higher than the students who used conventional methods with a significance level of 5 % .

In this research note that the difference in average mathematics students' ability to think logically between the experimental group and a control class that shows that learning mathematics using a problem solving approach to the model search , solve , create and share (sscs) better than conventional learning . Since the SSCS model of Problem Solving approach is student-centered learning , training students to solve a problem with the stages or steps to resolve independently, the teacher is no longer the center of the learning process but as a facilitator guiding the learning process in the classroom so that trains students to think logically . While in the conventional learning teacher is the source of the learning process . Students just passively listening to the teacher so it does not develop the ability to think logically .

Problem Solving Approach SSCS models in this study consists of 4 stages of learning, namely: to investigate the problem (search), the settlement plan and solve problems given (solve), to make a settlement results in the form of a product or formula which is the conclusion of the subject matter on the analysis results previous phase (create), communicate the results of

the settlement (share). In the process students are given pembelajaran Student Worksheet (LKS). The first stage in the learning of mathematics with a model SSCS Problem Solving approach is to investigate the problem (search), students are given a case or problem at the beginning, then the students are asked to write about what is known and what is asked in the given case. Search phase is to develop the ability of students to be able to express situations or issues contained in the case so as to resolve the issue in accordance with the context of the problem. So the indicator corresponding logical thinking ability and can be developed from this stage is to identify and examine the relationship between the facts in resolving the problem.

The second stage is planned settlement and resolve a given problem (solve). At this stage students plan ways to solve a given problem and then solve it. Solve this phase develops students' skills in analyzing the concept of a given problem and the ability to solve problems. Indicator of the ability to think logically so that conformity and can be developed in this phase is to identify the problem by analyzing some cases given and menyelesaikan problems by giving reasons.

The third stage is to make a settlement results in the form of a product or formula (create) . At this stage the students construct their own knowledge of identifying and analyzing the results of previous stages are related to the subject matter by giving the reasons of its findings . The create phase develops students 'ability to think and menganalisis concepts based on their knowledge and develop students' ability to infer the concept of the findings . Indicator of the ability to think logically so that the appropriate mathematical and can be developed from this stage is to identify and examine the relationship between the facts in resolving the problem , solve the problem by giving reasons , identify the problem by analyzing some cases given , and make conclusions .

The fourth stage is to communicate the results of the settlement (share) . In this phase, students explain the results of the completion of a given problem by presenting the results of their findings in front of the teacher and other students . Share this phase develops students' ability to be able to explain the work they have completed . So that the indicator 's ability to think logically and mathematically appropriate siswa can be developed at this stage is completed permasalahan giving reasons and the ability to make conclusions .

Material and final test or post test given to the control group at the end of the material and the test or post test given to the experimental group and the difference in approach to learning models that are used in class . This test is given to measure the ability to think logically mathematics . Mathematical logical thinking ability of students can be seen from the answers given .

Based on the above description shows that the study of mathematics by SSCS model of Problem Solving approach is applied in the learning process may influence the well logical mathematical abilities of students , especially in the second indicator and a third indicator , namely the ability of students to solve problems by giving reasons and the student's ability to identify problem by analyzing some cases given . In the first indicator and the fourth indicator is the ability of students to identify and examine the relationships between facts in solving problems and the ability of students to make inferences also influential , although the effect is not as big as the second and third indicators . Thus , the students are taught to approach Problem Solving SSCS models have the ability to think logically math better than students taught with conventional learning models .

CONCLUSION AND SUGGESTION

A. CONCLUSION

Based on the analysis and discussion , it can be concluded that in the study :

1. Ability to think logically students with a learning approach that uses the Problem Solving Model Search , Solve , Create and Share in general has been quite good , it is seen from the average results of the test of logical thinking ability of students is equal to 70.09 .
2. Ability to think logically students using conventional learning in general is still relatively low , it is seen from the average results of the test of logical thinking ability of students is equal to 54.91 .
- 3 . Ability to think logically students who are taught to approach problem solving model of search , solve , create , and share (sscs) higher than the logical thinking ability of students taught with conventional teaching . This is evident from testing the hypothesis of $t = 3.38$ and $t_{table} = 2.00 = 0.05$) greater than that of t_{α} with significance level of 5% , or ($t_{table} (3.38 > 2.00)$) . Thus , logical thinking ability of students taught with mathematical problem solving approach the model search , solve , create , and share (sscs) higher than students taught with conventional teaching . This is supported also by the results of the percentage score for each indicator logical mathematical thinking ability of students in the experimental group showed higher yields than the control class .

B. SUGGESTION

Based on the research results that have been obtained, the researcher can provide the following suggestions:

1. Those schools and the teachers, especially math teachers, should use the approach of Problem Solving Model Search, Solve, Create and Share as an alternative in the learning process, especially to improve the mathematical ability of students to think logically.
2. Research was only shown in the subject matter of mathematics on Social Arithmetic and Comparisons, therefore research should also be done on other mathematical subject matter.
3. Preferably the process of learning mathematics with the approach of Problem Solving Model Search, Solve, Create and Share more frequently applied, so the logical mathematical thinking ability of students may increase as students gain the learning atmosphere of the ordinary and can interact directly with peers and teachers.
4. Controlling the variables in this study were measured only on the ability to think logically, while other aspects are not controlled. For further research should look at the effect of using the approach Problem Solving Model Search, Solve, Create and Share against other mathematical ability.

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