

# Using Teaching Materials Outdoor Learning to Improve Mathematical Problem Solving Ability

Wanti Asmara, Lia Waroka, Eka Novrianti Prana Putri, Detty Syefriyani, Tanti Novita, Saleh Haji

Postgraduate of Mathematics Education  
University of Bengkulu  
Bengkulu, Indonesia  
wanti.asmara@gmail.com, lia\_waroka35@yahoo.com

**Abstract**—The purpose of this study is to determine the improvement of students' mathematical problem solving. The teaching materials consist of textbooks and LKPD. This type of research is quasi experiment (quasi-experimental) with the research population, namely grade VII students of Bengkulu City 19 Middle School. The results of this study include the use of outdoor learning teaching materials can improve students' mathematical problem solving abilities, with a n-Gain value of 0.50 (moderate).

**Keywords**—outdoor learning teaching materials; mathematical problem solving ability

## I. INTRODUCTION

Material teach is one of the learning tools that must be owned in each learning process. Teaching materials can be in the form of Learning Implementation Plans (RPP), Student Worksheets (SW/LKPD), and Textbooks. As said by Lestari teaching materials are a set of learning tools or tools that contain learning material, methods, limitations, and ways designed to evaluate on a systematic and interesting in order reach the expected goals, namely reach competence or sub competence with all complexity [1]. Teaching materials are an important component in learning, as said by Walid and Hidayah, but has a very high influence and role in the learning process [2]. This is due to teacher relations, learning resources and students. One way to improve the results of mathematics learning is to use teaching materials that are in accordance with the learning and the learning environment including adequate facilities and infrastructure so that learning is more meaningful.

In the implementation, the teacher is supposed to be a facilitator in learning, how students as learning subjects conduct activities to improve their knowledge. The teacher should focus his teaching on developing the intelligence, physical, and emotional of students, without neglecting character formation. For this reason, it is necessary to choose an appropriate learning model that can achieve the objectives of a learning to be achieved.

Education is not only how to acquire knowledge, but also an effort to improve understanding, attitudes and skills and children's self-development. This ability or competence is expected to be achieved through various learning processes in schools. One of the learning processes used to achieve the

above competencies is through learning outside the classroom (outdoor). According to Harte who suggested that outdoor learning is one way to involve young children, because there are many benefits for children, including helping children become more connected with situations outside the home and learn to recognize external objects [3]. Learning through experience directly outside the classroom makes it easy for students to learn material. Direct experience outside the classroom can also strengthen the mastery of concepts that students receive in class. According to Broda which mentions "after an indoor presentation about geometric shapes, a trek to the schoolyard to find the same shapes in nature can make abstract concept much more concrete" [4]. Student learning outside the classroom can strengthen understanding of the concept of matter.

Problem solving is one aspect of high-level thinking skills. Polya states that problem solving is a very high level of intellectual activity [5]. Problem solving is an intellectual activity to find solutions to problems faced by using the knowledge that has been owned. According to Brunner in, if students try themselves to look for problem solving and the accompanying knowledge, producing the accompanying knowledge, it will produce truly meaningful knowledge [6].

So formula problem in this research is how use outdoor learning teaching materials could increase ability solving problem mathematical students of SMPN 19 Bengkulu City?

## II. METHOD

This study was an assessment phase of Plom's developmental research model. In this phase, we conducted the test, evaluation, and revision of the teaching materials, outdoor learning. The population of the study was all 7 class students in junior high school of SMPN 19 Bengkulu. The sample was selected by the intact group technique. The outdoor learning in the experiment class, and the conventional approach was implemented in the control class. It was used to measure student's problem solving. Data were analyzed by Analysis Covariance test.

## III. RESULTS AND DISCUSSION

Before carrying out the learning process using outdoor learning teaching materials, a pre-test is given with the aim to

find out the initial level of students' problem solving abilities as well as the readiness of students towards the material to be taught. The form of tests given in the form of description questions that are in accordance with the indicators of the ability to solve problems.

Based on the pre-test given, it shows that the initial ability of students in Experimental Class problem solving abilities still relatively low. This can be seen from the results of pre-test scoring that has been done where the problem-solving ability of students averages a score of 9, 48 or with the average value of 32.7 out of a maximum total score of 29. The low score of these students is due by various causes, including there is some students who answer questions directly without analyzing the problem, there are students who do not make an answer plan or conclusion answer, even there is participants learner are not serious answer test ability.

After giving the pre-test, the treatment is done, namely by applying learning outside class (outdoor learning). The learning process carried out during the study has followed all the syntax of outdoor learning, so it is expected can optimize students' problem solving abilities. After the learning is done, it is given a post-test at the end of the meeting. Based on the posttest given, it shows that the problem solving abilities of Experimental Class students belong to the high category. This can be seen from the results of the post-test scoring that has been done and obtained average score of 17, 9 or with a score of 61.7 from a maximum total score of 29.

In N-Gain scoring between pretest and posttest students' problem-solving ability an average N-gain score of 0, 50 with N-gain criteria in the medium category. From the score of increasing posttest and pretest scores as well as from N-gain scores then learning with outdoor learning can improve students' problem solving abilities and creative thinking abilities.

In summary, the results of the pretest and posttest data on the problem solving abilities of the experimental class and control class are presented in table 1.

TABLE I. PRETEST AND POSTTEST DATA ON PROBLEM SOLVING ABILITY OF STUDENTS IN EXPERIMENTAL AND CONTROL CLASSES

Information	Experiment Class		Control Class	
	Pretest Score	Posttest Score	Pretest Score	Posttest Score
Average ( )	32.58	61.71	27.10	50.23
Variant (S <sup>2</sup> )	218.12	539.01	248.22	520.25
S	14.77	23.22	15.76	22.81
Minimum Score	7	24	7	17
Maximum score	59	93	55	93
N-Gain Score Average	0.50		0.36	

The data can make with graphic image following this:

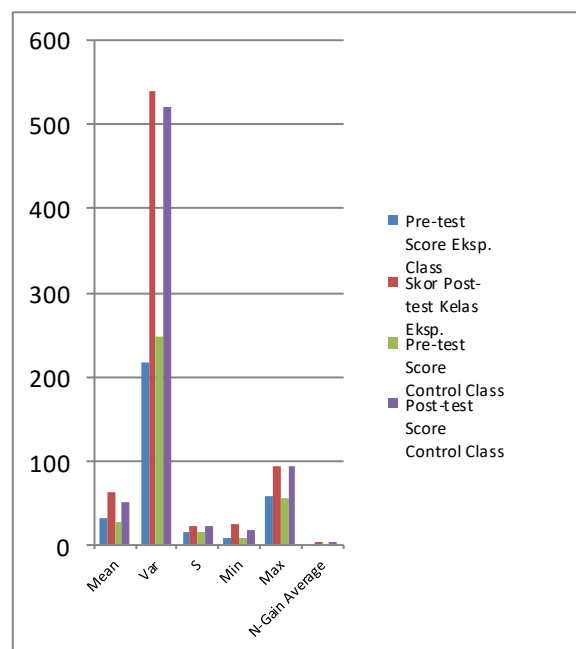


Fig. 1. Histogram score problem solving ability.

Based on table 1. obtained the average pretest score, posttest average and the average n-Gain score, the problem solving ability of the experimental class students was higher than the control class so that there was an increase in the value of problem solving ability higher than the control class increase.

Based on the results of pretest, posttest and average N-gain problem solving ability of students both experimental class and control class showed that the average score of the problem solving ability of the experimental class students was higher than the control class, and there was an increase in the average score from before the treatment with after treatment both experimental class and control class. Calculation of data from the pretest and posttest of students' problem solving abilities is done manually assisted by using Microsoft Excel 2010 programs.

This caused by use outdoor learning teaching materials that make student to be more active and creative because directly related with problems that exist in life (outside class).

#### IV. CONCLUSION

Based on the research that has been done, it can be concluded that the use of mathematics teaching materials in non-classroom learning can improve the ability to solve mathematical problem with an increase in value (N-gain) of 0.50 (which means increase). It is because the current students do outside class learning, students direct contact with the real world as learning objects. Students also become more socializing with the environment, be it classmates or the community around the learning object. So that could have concluded by using mathematics teaching materials in classroom learning (outdoor learning) can improve abilities solving problem mathematical student.

For researchers who want to do research, can lift the title of this article, namely the application outdoor learning teaching materials, for increase ability solving problem mathematical student, fine it's development or experimental research.

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