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Influence of Learning on Realistic Mathematics ICT-Assisted Mathematical Problem Solving Skills Students

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Abstract: This research study aims to (1) determine whether or not the influence of ICT-assisted learning realistic mathematics to students' mathematical problem solving ability. (2) Develop the learning model of the integration of mathematics realistic education with Information Technology. The research was conducted in class VIII in the second semester of school year 2014-2015. The sample used in this study were 88 students in each class numbered 44 students in the experimental class and 44 students in the control class. The research validators included one expert in Mathematics education and one expert in instructional multimedia. The instruments employed in this study were a questionnaire, observation guide, and pre-test and post-test. The data were analyzed by using descriptive statistics. This study uses a quasi-experimental design. Instruments used in the form of test problem-solving ability in the form of a description. The research finding is that the mathematical problem solving ability of students taught using ICT-assisted learning realistic mathematics higher than that is not taught using ICT-assisted learning realistic mathematics.

Keywords: *Realistic Mathematics-ICT Assisted, Mathematical Problem Solving Ability*

1. Introduction

The important of problem solving in mathematic learning has encourage many teachers to develop their students' problem solving skills. Improving the problem solving will encourage students to better understanding of mathematics and solving various problems. If the students have the high quality of problems solving then students will be easy to solve various kind of problem life.

Tests results of Trends in International Mathematics and Sciences Study (TIMSS) held by the International Association for Evaluation of Educational Achievement (IEA) suggests that mathematical ability of grade 8th of Junior High School in Indonesia is still quite alarming, which is ranked 38 from 45 countries (Mullis, 2012). The ability of grade 8th of Junior High School in Indonesia for completing non-routine problems (mathematical problem) is very weak, but relatively well in resolving questions about the facts and procedures.

2. Realistic Mathematics Education ICT-Assisted

Treffer (Wijaya, 2012) formulate five main characteristics of realistic mathematics education, namely (1) the use of context, (2) use the model for progressive mathematics process, (3) utilization of construction student outcomes, (4) interactivity and (5) linkages. The use of context of realistic mathematics learning is the first step in building and find back a math concept through mathematical process. The mathematical process come from horizontally mathematics process to vertically. Mathematics in the horizontal process starts from the issue-a matter of contextual, then students define for themselves the language and symbols of its own. While vertical mathematics is a process

that occurs within the system itself mathematical concepts such as the use of multiplication, division, addition or subtraction.

Microsoft power point is used in this ICT-assisted learning of realistic mathematics education. Power point is used to display the contextual issues related to real life, so hopefully the students may be interested to resolve the problem.

3. Mathematical Problem Solving in Realistic Mathematics Education

In realistic mathematics, learning begins with contextual issues (real-world), allowing students to use prior experience directly. Through abstraction and formalization performed by the students will develop a more complete concept. Furthermore, students can apply mathematical concepts to new areas of the real world (applied mathematization). Therefore, in order to bridge the math concepts with everyday experiences children need to be considered mathematical from everyday experience (mathematization of everyday experience) and the application of mathematics in everyday life (Bonotto, 2000). In the context of real-world use students will develop mathematical concepts as part of the priorities within the framework of the process of mathematical problem solving. The use of real-world contexts will also foster a sense of pleasure in doing mathematics that will encourage perseverance in resolving the problem (Ginsburg et al, 2005).

4. Research Method

This study used a Quasi Experiment design. Data sources in this study were students of VIII-6 class as the class were taught by a realistic mathematics education ICT assisted (experimental class), and students of VIII-8 class as a class taught without a realistic mathematics education ICT assisted (control class) in SMPN 4 Bekasi registered in 2014/2015 academic year. Collecting data using a written test with a test item instrument description, which is to measure the ability of students problem solving skills.

5. Results

The mathematical problem solving ability of students taught using ICT-assisted learning realistic mathematics higher than that is not taught using ICT-assisted learning realistic mathematics.

Table 1: The result of mathematical problem solving ability between experimental and control class

Mathematical problem solving ability indicator	Items	Ideal score	Experimental class		Control class	
			Average score	Gain	Average score	Gain
understanding, planning, problem solving, revise and check.	1	10	5,3	53%	5,1	51%
	2	10	1,3	13%	2,8	28%
	3	10	3,8	38%	2,3	23%
	4	10	3,1	31%	2,6	26%
	5	10	4,2	42%	2,9	29%
	6	10	3,7	37%	2,6	26%
	7	10	4,6	46%	2,4	24%

Score data calculation results of mathematical problem solving ability experimental class students obtained an average score of 41.409 and a standard deviation is 9.061, while the control group gained an average score of 33.136 and a standard deviation is 10.409.

6. Conclusion

$t_{count} = 3.997 > 1.666 = t_{table}$ it can be concluded that the H_0 is rejected. The conclusion is ICT-assisted learning Realistic Mathematics affect the ability of students' mathematical problem solving.

The next step calculates how much influence the ICT-assisted learning realistic mathematics to students' mathematical problem solving ability. After doing the calculations obtained ES (effect size) = 0.795 or 79.5% is included in medium condition.

Math teacher can be expected to pay more attention to mathematical problem solving skills as the ultimate goal of learning mathematics. The use of ICT in teaching and learning will allow students in the learning process, and can attract students to learn mathematics. Realistic mathematics education can be used as a mathematics teacher learning approaches in enhancing students' mathematical problem solving ability.

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