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The Influence of Learning Device with Core Model to Improve Problem Solving Ability of Student Class VIII of Junior High School

1st Indartia Yuana Arizal
Mathematics Department
Universitas Negeri Padang
Padang, Indonesia
indartiayuana@gmail.com

2nd Edwin Musdi
Mathematics Department
Universitas Negeri Padang
Padang, Indonesia
win_musdi@yahoo.co.id

3rd Syahrul Ramadhan
Lingustics and Arts Faculty
Universitas Negeri Padang
Padang, Indonesia

***Abstract*— The aims of this research is to know effect of learning device based on CORE models (Connecting, Organizing, Reflecting, and Extending) to mathematical problem solving ability at the level of junior high. This research is a quasi experimental with subject of students class VIII SMPN 12 Padang. The instrument used is test and analysis using t-test. The results of this research showing that the learning device based on CORE models have an effect to the mathematical problem solving ability of the students.**

Keywords*— *Learning device, CORE Models, Problem Solving Ability

I. INTRODUCTION

In the current 2013 curriculum in which students are required to take an active role in the learning process. Activities that make students participate actively and reflect on what they learn can be done in the form of discussion. Discussion is an activity that two or more people attend to share ideas and experiences and expand knowledge. Discussion method is a way of teaching by linking topics or issues that trigger discussion participants to try to achieve or obtain a mutually agreed decision or opinion [5].

Calfee et al. proposes a learning model that uses discussion methods to influence the development of knowledge by involving students called the CORE model (Connecting, Organizing, Reflecting, Exending) [6]. Learning model CORE thinking activity is greatly emphasized to learners. So the teacher is only besifat as facilitator, motivator and mediator. These elements are used to link old information with new information, organize varying materials, reflect on everything students learn and develop the learning environment.

Connect language means to connect, connect, and connect. Connecting is an activity of connecting old information with new information or between concepts. The old and new information that will be linked to this activity are old and new concepts. At this stage students are invited to connect new concepts to be studied with the old concept they have, by giving students questions, then students are asked to write related things from the question. Katz and Nirula suggest that with Connecting, a concept can be linked to other concepts in a class discussion, where the concepts to be taught are related to what the student already knows. In order to play a role in discussion, students must remember and use the concepts they have to link and construct their ideas [4].

Connecting is closely related to meaningful learning. According to Ausabel meaningful learning is the process of linking new information or material with concepts that already exist in a person's cognitive structure. The cognitive structure is interpreted by Ausabel as the facts, concepts and generalizations that the learners have learned and remembered. With meaningful learning, students' memories become strong and learning transfers are easy to achieve. Connection (connection) in relation to mathematics can be interpreted as an internal and external relevance. Internal linkage is the relationship between mathematical concepts that are related to the mathematics itself and the external relationship that is the link between the concept of mathematics with everyday life.

According to NCTM, if students can connect mathematical ideas, then their understanding will be more profound and lasting. Bruner also argued that in order for students to study mathematics more successfully, students should be given more opportunities to see the links between theorems and theories, theories and topics, concepts and concepts, as well as between branches of mathematics. Thus, to learn a new mathematical concept, in addition to being influenced by the old concept that has been known to students, past learning experience of the students will also affect the learning process of mathematical concepts. Because, someone will be easier to learn something when learning is based on what has been known to the person. Because, someone will be easier to learn something when learning is based on what has been known to the person.

Organize language means organizing, organizing, organizing, and organizing. Organizing is an activity to organize the information obtained. At this stage students organize the information they get as well as what concepts are known, what concepts are sought, and the interrelationships between what concepts are found in the Connecting stage to build their own (new concept) knowledge. To be able to organize the information it acquires, each student can exchange opinions within his group by creating concept maps so as to form new knowledge (new concepts) and gain a good understanding. Organizing is the preparation of sources of knowledge in the form of unity in a certain way so that the designed objectives

can be achieved. At this stage learners organize the information they get, such as what concepts are known, what concepts are sought, and the interrelationships between what concepts are found in the Connecting stage to be able to build their own (new concept) knowledge.

Reflect by language means to describe, imagine, reflect, and reflect. Sagala reveals reflection is a way of thinking back about what has been done in terms of learning in the past. Reflecting is an activity to rethink the information already obtained. At this stage students rethink the information they have acquired and understood at the Organizing stage. In the discussion activities, students are given an opportunity to rethink whether the results of the discussion / results of group work at the organizing stage is correct or there are still errors that need to be corrected. Maulana argues that reflecting is an activity to rethink the information already obtained. At this stage learners rethink the information they have gained and understood at the Organizing stage. Further learners build new knowledge to solve problems.

Extend language means extending, delivering, extending, giving, and extending. Extending is a stage where students can expand their knowledge of what has been gained during the learning process takes place. Extending is intended as a stage where learners can expand their knowledge of what has been obtained during the learning process takes place. The extension of knowledge can be done by using the concept that has been obtained into new situations or different contexts as the application of concepts studied, either from a concept to another concept, other fields of science, or into everyday life.

One of the competencies in learning mathematics that must be possessed by learners is the ability to solve mathematical problems. This is stated in Permendikbud RI no. 58 year 2014 which contains about the purpose of learning mathematics. Problem solvers are the process of applying the previously acquired knowledge of new and different situations [7]. Although problem solving is an integral part of mathematical problems, many learners still find it difficult to solve math problems.

The TIMSS study results in 2015 show that Indonesia is ranked 45th out of 50 countries with 397 points. In addition, the results of PISA's three yearly survey in 2015 also showed Indonesia ranked 69 out of 71 countries with an average score of 386. The results of this TIMSS and PISA survey show that the mathematics skills of learners in Indonesia are still far behind with the math skills of learners in other countries. This can be proved by the results of literature analysis conducted by Fauzan and Tasman in West Sumatra which states that the mathematical ability of junior high school / MTs students still tend to be low [8]. Mathematical abilities are discussed one of them is the ability to solve mathematical problems.

From the purpose of learning mathematics and literature studies above shows that one of the mathematical skills that must be possessed learners is the ability to solve problems. Branca suggests that the ability to solve mathematical problems is important because (i) problem-solving skills are the general objectives of teaching mathematics; (ii) problem solving which includes methods, procedures, and strategies is a core and major process in the mathematics curriculum; (iii) problem solving is a basic ability in learning mathematics [2].

The problem-solving ability of the learner has not been maximally evolved is also explained in some journals stating that the problem solving ability of the learner is not optimal or still very low. This is not only happening in Indonesia but also in other countries. Jinfa in his journal states that the development of students' ability in China to solve problems as one of the goals in learning mathematics in schools is still a fundamental issue [3]. This fact certainly applies also in Indonesia.

Based on the exposure that has been raised, one of the goals of learning mathematics that must be possessed learners is the ability problem-solving. In order to solve the problem of learners can be improved then the development of learning devices based on the appropriate model of learning, so as to facilitate learners to participate actively in learning and learning process becomes more meaningful. The learning model chosen in this research is Connecting, Organizing, Reflecting and Extending (CORE).

II. METHODS

In this research the method used is quasi experiment. Experimental research is a study intended to determine whether there is a result of something imposed on the subject under investigation [9]. The form of research used in this study is quantitative research using pre experimental methods. Form of pre-experimental designs there are several kinds: One-shot Case Study, One-Group Pretest-Posttest Design, and Intact-Group Comparison. Of the three forms presented, the researchers chose the model One-Group Pretest-Posttes Design. Population in this research is student of SMPN 12 Padang year lesson 2017/2018. Subjects in this study were students class VIII SMPN 12 Padang Year Lesson 2017/2018. The instruments used are problem solving test and analyzed using t-test.

III. RESULTS AND DISCUSSION

This study aims to determine the fragrances of CORE model of mathematical problem solving ability of students of class VIII SMPN 12 Padang. The results of statistical calculations can be obtained as follows:

TABLE I. RESULTS ANALYSIS OF THE PROBLEM TEST RESOLUTION MATHEMATICAL PARTICIPANTS

Tes	N	$\overline{X}$	Standar Deviasi	Xmax	Xmin	Median
Pretest	34	58,6	18,57	76,8	25	50,9
Posttest	34	75,0	16,81	100	52,8	76,2

The student's mathematical problem solving test consists of 5 essay items at the first test (pretest). The results of the first test analysis of mathematical problem solving ability of students showed the mean or average is 58.6 with the lowest score obtained by learners is 25 and the highest score of 76.8. Then learners are treated (treatmen) ie learning is done by using the CORE model and performed the final

test (posttest). The final test (posttest) also consists of 5 items essay. The final test result (post test) problem solving ability mathematically learners show better result. The mean or average that the learners gained during the posttest was 75.0 with the highest score being 100 and the low 52.8. The test results t and t table can be explained as follows:

TABLE II. RESULT ANALYSIS TEST - T AND T TABLE

t hitung	N	t tabel	Taraf signifikan
6,4822	34	2,042	0,05

Based on the above table obtained that t arithmetic ≥ t table with t arithmetic = 6, 4822 and t table = 2.042. This means that CORE model has an effect on improving mathematical problem solving ability of students of class VIII SMPN 12 Padang.

Furthermore, the calculation is done as Anas Sudijono to obtain relative frequency (percentage number), used the formula [1]:

$$P = \frac{f}{N} \times 100\%$$

After knowing the calculation of each data then the result of each calculation included into the formula P = f / N x 100% = 16.4 / 34 x 100% = 48%, so obtained the percentage increase in learning outcome of 48%.

IV. CONCLUSION

Based on data analysis of research results that have been raised can be concluded that there is influence of learning device based on CORE model with t arithmetic = 6.4822 ≥ t table = 2.042 and there is improvement of problem solving ability learners equal to 48%.

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