IMPROVING MATHEMATICAL CONNECTIONS ABILITY OF STUDENT THROUGH *SOMATIC, AUDITORY, VISUAL, INTELLECTUALITY* (SAVI) LEARNING MODEL

(CAR of Mathematics Teaching in Grade VIII H of SMP Al-Islam 1 Surakarta for 2012/2013 Academic Year)

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Surakarta, 12 Juni 2013

Pembimbing

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ABSTRACT

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The objective of this research is to improve the mathematical connections ability of student in mathematics teaching grade VIII H SMP Al-Islam 1 Surakarta through Somatic, Auditory, Visual, Intellectuality (SAVI) learning model. The type of this research is Class Action Research (CAR) with subject is the student grade VIII H SMP Al-Islam 1 Surakarta for 2012/2013 academic year with the number of students are 26 students. Method of collecting data is obtained from observation, field notes, documentation, and test. The technique of data analysis in this research is data reduction, data presentation, and data verification. The results of research are shown the improvement of mathematical connections ability of student for each indicator, they are:: 1) write the daily live problem into mathematical models, include: before the treatments are given there are 5 students (20.83%), after treatment there are 20 students (90.91%), 2) write the mathematical concepts underlying an answer, include: before the treatments are given there are 6 students (25%), after treatment there are 21 students (95.45%), 3) write the relationship between the objects and mathematical concepts, include: before the treatments are given there are 2 students (8.3%), after treatment there are 18 students (81.82%). So, it can be concluded that SAVI learning model can be improved the mathematical connections ability of students.

Keywords: Mathematical connections, SAVI learning model.

INTRODUCTION

The process of learning is not simply memorizing activities only. Learn not to swallow all it all, but to remember what has been taught, students must construct knowledge within them. Students themselves who will organize what they hear and see a unity that meaningful. Allowing students to discuss, ask questions, practice and even teach it to his friend, the learning process is actually going to happen.

Basic skills in general are expected to be raised and improved through learning activities mathematics one of which is the mathematical connections ability. The mathematical connections may be defined as the relationship between mathematical concepts, either with mathematics itself and the relationship of mathematics with other subject areas and everyday life. Indicator of the mathematical connections ability of students, there are: 1) Write the daily live problem into mathematical models, 2) Write the mathematical concepts that underlying an answer, 3) Write the relationship between objects and concepts of mathematics.

Based on observations that have been made in Grade VIII H SMP Al-Islam 1 Surakarta, the mathematical connections ability of students is still low. This is shown by 1) 5 students (20.83%) who were able to write the daily live problems into mathematical model, 2) 6 students (25%) were able to write the mathematical concepts that underlying an answer, 3) 2 students (8.3%) who were able to write the relationship between objects and concepts of mathematics.

The low mathematical connections ability of students may result from several factors, one of which is the teacher. Teacher is the main factors that can affect the level of mathematical connection ability of students. Teachers should be able to making class feel comfortable, utilizing instructional media maximally, and using interest and variation learning strategies to make students are more active in the learning process. Teachers also must be able to relate course material to real life, so that students understand the usefulness of mathematics in daily life. In addition, understanding of teachers about the character of student learning can also help students in understanding the subject matter.

Dave Meier (2002) says there are four characteristics of students in learning. First, students with the nature of somatic. Students learn actively by engaging directly in the learning activities. Second, students with the nature of auditory. Excess students to the nature of auditory lies

in the ability to hear and remember. During lessons they usually do not record, like chatting and easily distracted by other sounds.

Third, students who are visual, students with these character can be studied very well by looking at the actions of others. They prefer the presentation of information coherently and record what the teacher said during class, they are calm and rarely disturbed by the noise. Fourth, students with intellectual properties. Students with these properties can apply the information that has been obtained, and improve their understanding to resolve the problem. If all four of these characteristics can be incorporated into the effective learning can be achieved. One of by through Somatic, Auditory, Visuality, Intellectuality (SAVI) learning model.

Based on the above, researchers are encouraged to try to do one of the efforts to improve the mathematical connections ability of student through mathematics teaching, using a learning model of Somatic, Auditory, Visual, Intellectuality (SAVI). In SAVI learning model, the learning process will take place scientifically in the form of working activity and experience so that students directly encourage students to make connections between knowledge learned in daily life. By using SAVI learning model mathematical connection ability of students are expected to be increased in accordance with the expected goals.

Based on the problems above, the problem of this research can be formulated that: is there an increasing the mathematical connections ability of students through SAVI learning model on students in grade VIII H SMP Al-Islam 1 Surakarta?

Based the problem formulation, the general objective of this research is to improve mathematical connections ability of students. The specific objective of this research is to improve the mathematical connections ability of student in grade VIII H 1 SMP Al-Islam Surakarta for 2012/2013 academic year through the SAVI learning model.

This research is a qualitative type of Classroom Action Research (CAR). The research was conducted through a process of collaboration between teachers of mathematics with researchers in improving the mathematical connection ability of students through SAVI learning model with the steps are: a) planning, b) implementation, c) observation and monitoring, d) reflection.

The research was done in class VIII H SMP Al-Islam 1 Surakarta for 2012/2013 academic year. SMP Al-Islam 1 Surakarta is located on the Jln. Ponconoko 37 Surakarta. Subjects in this research are students in grade VIII H for 2012/2013 academic year and mathematics teacher of SMP Al-Islam 1 Surakarta. The number of students in this class are 26 students consisting of 14 boys and 12 female and the mathematics teacher as a research subject is Mr. Moh. Thoha Sholikin, S.Pd.

In this study, researchers was used four kinds of data collection techniques, namely: observation, documentation, field note, and test.

Observation technique was used to observe directly, careful, and conscientious about the phenomena occurring in the study. Observation study was used to known about the ability of teachers to implement SAVI learning model in the process of mathematics learning, but it is used to determine the level of mathematical connections ability of students after the implementation of the SAVI learning model. Observation made on the subject of the research, namely the students and mathematics teacher class VIII H SMP Al-Islam 1 Surakarta. Observations made is divided into two parts, there are before and after treatment observation.

Documentation in this study is obtained by collecting and analyzing the documents, both written documents, images and electronic-data related on SMP Al-Islam 1 Surakarta and identification of class VIII H like the names of students, a list of values to see the existing documentation in schools as well as photo recording process of the study.

Field notes was used to make a note about important events that occur during the learning process. Field notes in this study consist of

students activity, teacher activity, and conclusion of learning process. The field notes are made by researchers and mathematics teacher class VIII H SMP Al-Islam 1 Surakarta.

Test method was used test the mathematical connections ability. Tests given to students was used to determine the level of students 'ability to write their daily live problems into mathematical models, understanding of mathematics concepts, and students' ability to write the relationship between objects and concepts of mathematics. There are three tests given to students, namely: pre-action test, the first cycle test, and the second cycle test.

In this study, researchers was used three kinds of techniques of data analysis, namely: data collection process, presentation of data, and verification of data.

The process data analysis is done after all the data is obtained, either from observation, documentation, and field notes during the study. Then make a summary for each action in each cycle of treatment in the class. Based on this summary, the researcher makes the activity data reduction, including:

1) Select the data source based on the relevant
2) Classifying the data based on the type (simplification)
3) Focusing simplification and transferring raw data to the field note

The presentation of data in this study, researchers tried to compile the relevant data so that it can be information that can be inferred and has a specific meaning. By way of displaying the data and make the relationship between the variables, the researchers understand what is happening and what needs to be followed to achieve the research objectives.

Verification of data or inferences made in stages to obtain the degree of trust is high. Thus, analysis of the data in this study since the actions implemented. Data verification is done on every action that eventually combined into conclusions.

Technique of checking the validity of the data by observing continuously and triangulation. Tringulation is a technique of checking the validity of the data that utilizes something else out from the data for checking or as a comparison to the data. In this study, the validity is done by tringulation sources by way of utilizing the data that have been obtained by observation, documentation, field notes, and tests to check the degree of confidence.

RESULTS AND DISCUSSION

Result

Based on observations and initial test of mathematical connection ability of students who have done previously, it can be concluded that the level of mathematical connections ability of students class VIII H SMP Al-Islam 1 Surakarta is low, it is shown by: a) write daily life problem into mathematical models are 5 students (20.83%), b) write mathematical concepts that underlying an answers are 6 students (25%), c) write the relationship between objects and concepts of mathematics are 2 students (8.3%).

In this research applying SAVI learning model as a part of efforts to increase the mathematical connection ability of students. The study consisted of two cycles, with each cycle consisting of two meetings.

1. Implementation of SAVI in the first cycle

    Implementation of action research in grade VIII H SMP Al-Islam 1 Surakarta first cycle implemented with basic competence is determine the surface area of cube and beam are done in two meetings. The first meeting was held on Tuesday, 9th April 2012 at 09:00 to 10:40 and the second meeting held on Monday 15th April 2013 at 7:00 to 08:20.

    At the first meeting, the learning process begins with prayer, checking student attendance, and check the readiness of students to learn. Then, the teacher delivering teaching materials after it divides students into 7 groups with each group consisting of 3-4 students.

Each group was given two types of student worksheet to be discussed together with each group for 30 minutes. After discussion, a representative member of the group presented the results of group discussion in front of class, while the other groups respond to the presentations presented. Teachers act as facilitators and provide corroboration for the results of the discussion are presented. Furthermore, the students along with the teachers to make general conclusions on the material being taught.

At the second meeting, after the teacher begins the process of learning to pray, to check student attendance, and check the readiness of students to learn, and then to evaluate students' understanding of the material prior to the giving of test the ability to connect mathematical consisting of 3 questions which contain indicators the mathematical connections ability.

The results of the test mathematical connection ability of students after the implementation of the learning model of SAVI in the first cycle, they are: 16 students (61.54%) who were able to write the daily life problem into mathematical models, 14 students (53.85%) who were able to write the mathematical concepts that underlying an answer, and 7 students (26.92%) who were able to write the relationship between objects and concepts of mathematics.

2. Implementation of SAVI in The Second Cycle

Implementation of action research in grade VIII H SMP Al-Islam 1 Surakarta second cycle with basic competence is determine the volume of beams and cubes are done in two meetings. The first meeting held on Tuesday, 16th April 2013 at 9:00 to 10:40 and the second meeting was held on Saturday, 27th April 2013 at 08:20 to 09:40.

At the first meeting of the second cycle, the learning process begins with prayer, checking attendance, checking the readiness of students in learning, and reviewing the material that has been taught

in the first cycle. The teacher delivering overview of the material to be learned which determines the volume of cubes and blocks are then divided the students into seven groups with each group differently by members of the group in the first cycle. Each group was given 2 types of worksheets and some problems that should be discussed with the group. For groups who have finished first given the opportunity to present the results of their discussion to the class along with all members of their respective groups. Teachers provide additional point for the group has come forward to the presentation, and then guiding the course of group presentations. Teachers provide reinforcement response to the discussions presented students, then together with the teacher to make general conclusions about the volume of beams and cubes. At the end of the learning process students are given individual tasks which consists of 3 problems description and given a time limit for 20 minutes. After time is out, the learning process ends with greetings and remind students to study at home.

In the second meetings of second cycle, the teacher begins the lesson by reviewing the material in the first meeting of the second cycle of evaluation materials. After the review previous material, then students are given questions test the ability to connect mathematical second cycle consisting of 3 questions a description that includes indicators of the mathematical connections ability.

The results of the test of mathematical connection ability of students after the implementation of the SAVI learning model in the second cycle, they are: 20 students (90.91%) who were able to write the daily life problem into mathematical models, 21 students (95.45 %) who were able to write the mathematical concepts that underlying an answer, 18 students (81.82%) who were able to write the relationships between objects and concepts of mathematics.

Based on the results of test mathematical connection ability of students made from prior research to second cycle studies showed that

the SAVI learning model can improve the mathematical connections ability of student in grade VIII H SMP Al-Islam 1 Surakarta for 2012/2013 academic year.

For more details of improving the mathematical connection ability of students can be shown in the table below:

Table 1

Data of Mathematical Connection Ability of Students Before and After Implementation of SAVI Learning Model.

No.	Indicators	Number of Students (Percentage)		
		Before Treatment	Cycle I	Cycle II
1.	Write the daily life problem into mathematical models.	5 students (20.83%)	16 students (61.54%)	20 students (90.91%)
2.	Write the mathematical concepts that underlying an answer	6 students (25%)	14 students (53.85%)	21 students (95.45%)
3.	Write the relationship between the object and concepts of mathematics	2 students (8.3%)	7 students (26.92%)	18 students (81.82%)

As for the graphics of improving the mathematical connections ability of students in mathematics learning before and after implement SAVI learning model can be seen as follows:

Figure 1
Graphics of Improving the Mathematical Connections
Ability of Students Before and After Implement SAVI
Learning Models in Mathematics Learning
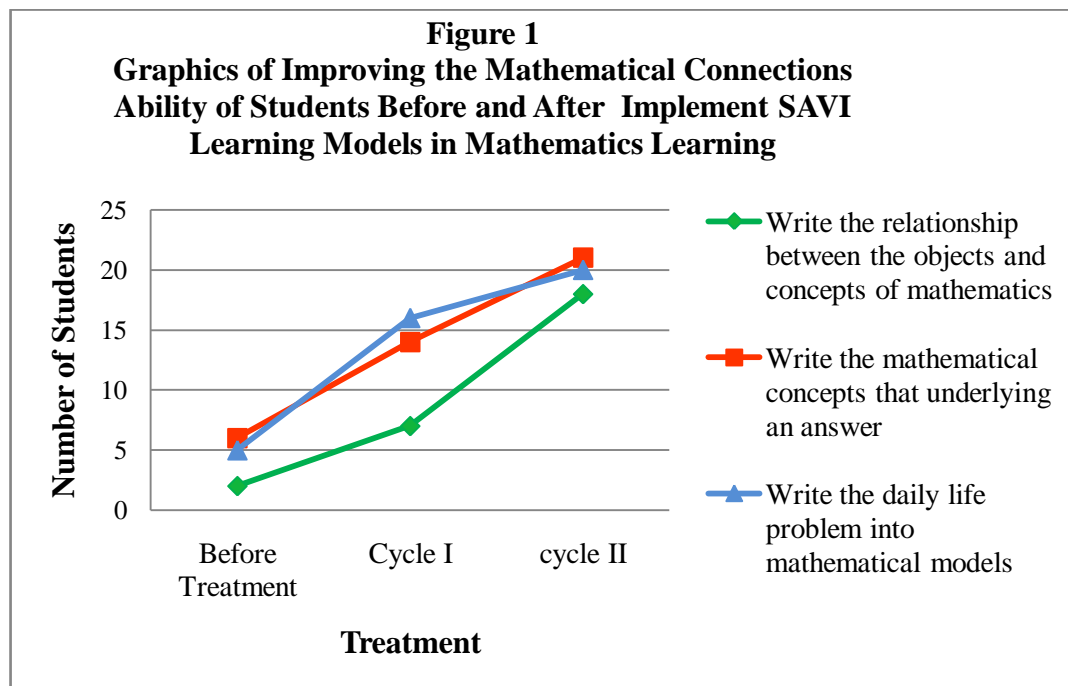
Discussion

The problem in this study: is there an increasing the mathematical connections ability of students by using SAVI learning model in grade VIII H 1 SMP Al-Islam Surakarta?

After applying SAVI learning model in mathematics, the result that there is an increasing the mathematical connections ability of students in mathematics learning. The implementation of SAVI learning model can make student to interest, active in the learning process and team work with other friends. The indicators of the mathematical connection ability of student in this study are:

1. Write the daily life problem into mathematical model.

   After applying the SAVI learning model where students can be more active and able to create learning experiences can help students connect the relationship some topics in mathematics with daily life problems. Students can infuse the daily life problems into mathematical models, thus can help students see the usefulness of mathematics in daily life. Meier (2002: 145) said that the SAVI learning model the teachers should encourage students to think, say,

and do-handle learning new material by helping them to integrate the material in the structure of knowledge, meaning, and the internal skills of students so that students are able to apply them in daily life.

2. Write the mathematical concepts that underlying an answer.

Before applying SAVI learning model in learning, students are confuse and do not understand the mathematical concepts which are used to answer the questions given by the teacher. After applying the SAVI learning model by looking and listening to teachers' explanations, students begin to understand the concepts of what should be known to answer the questions given by the teacher. Meier (2002: 99) said that by using visual skills in SAVI learning model, students are asked to observe the real situations and to think and to talk about the situation, write and illustrate the principles, concepts and meanings so that they are able to solve a problem related .

3. Write the relationship between object and mathematical concepts.

Before applying SAVI learning model, many students who have not been able to build knowledge through objects and connected with mathematical concepts. Through the application of SAVI learning model in mathematics learning, students are guided to begin to build objects and connecting objects with mathematical concepts are then used to answer the questions given by the teacher. Meier (2002: 99) said that through intellectual of students can create relationships and meaning in mind, bringing together experience and learning. Connect students experience mental, physical, emotional, and intuitive body to build new meanings for themselves.

The research results are support the research that has been conducted by Yuniawatika (2011) by applying REACT strategy in mathematics learning can improve the mathematical connections and representations ability of students in grade V Elementary School, Cimahi. Moreover, in a study conducted Dianne Kusuma Amor (2008) by using a constructivist approach to learning mathematics states that the

mathematical connections ability of students with constructivist approach in learning is better than using the conventional learning.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the results of action research conducted in collaboration between researchers and mathematics teacher on 9th April until 27th April 2013 in grade VIII H SMP Al-Islam 1 Surakarta, the conclusions are:

1. Write the daily life problem into mathematical model

   At first conditions before the study, there are 5 students (20.83%) who were able to write the daily life problem into mathematical model. At the end of the cycle ability of students to write the daily life problem into mathematical model has increased there are 20 students (90.91%).

2. Write the mathematical concepts that underlying an answers.

   At first conditions before the study, there are 6 students (25%) who were able to write mathematical concepts that underlying an answer. At the end of the cycle students' ability to write the mathematical concept underlying an answer has increased there are 21 students (95.45%).

3. Write the relationship between objects and concepts of mathematics.

   At first conditions before study, there are 2 students (8.3%) who were able to write the relationship between objects and concepts of mathematics. At the end of the cycle students' ability to write the relationship between objects and concepts of mathematics has increased there are 18 students (81.82%).

Suggestion

Based on experience in the application of learning models SAVI in the learning process of mathematics, it is recommended that:

1. To the teachers

   a. Teachers should improve the mathematical connections ability of students in learning mathematics, because it can help students in

understanding topics in mathematics, one of them by applying the learning model of SAVI that is by combining physical movement with intellectual activity and relate course material to their daily life is around the students.

b. Teachers need to maximize the learning media provided that the material taught to be more real for students and increase student motivation in mathematics learning, so the mathematical connections ability of students can increase.

c. Teachers are expected to create an atmosphere of learning interesting and varied, both in groups and individually in order to create a conducive learning environment and not boring for students.

2. To the next researchers

For the next research are expected to research that focuses on improving the mathematical connections ability of student by SAVI learning model can be used as a reference for developing for the next research, which can be used to solve problems that arise in mathematics learning in the educational unit.

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