

THE “REACT “ STRATEGY APPLICATION IN THE STUDY OF MATHEMATICS

Marlan

Universitas Simalungun, Pematang Siantar, INDONESIA.

marlan-usi@yahoo.com

ABSTRACT

Teaching Mathematics needs the creative strategy. One of them is creative thinking Reaction. This paper presents the application of the “React” Strategy. REACT means “Relating, Experiencing, Applying, Cooperating and Transferring”. This study used the REACT to stimulate the thinking creatively in Mathematics lesson as dependent variable, and independent one was students’ reaction. The t- and thinking tests were used as instruments of this research. Those were used to reveal the students’ creative thinking ability. It was obtained that the value $T_{count} = 9,08$ and $T_{table} = 2,005$ or $9,08 > 1,9554$, with $df = 48$ so it is obtained $T_{count} > T_{table}$ so H_a is accepted or can be understood that there is influence of learning strategy REACT on the ability to think creatively mathematically grade VII students of Junior High School X Pematang Siantar Indonesia. It concludes that the REACT strategy affected the students’ creative thinking ability, (2) student activity final examination.

Keywords: React Strategy, creative thinking, Mathematics lesson

INTRODUCTION

Teaching Material of Science Branches such Mathematics lessons are difficult subjects for some students in Junior High School (*SMP-In Indonesia*). Furthermore, the Mathematics lessons are divided into several subtopics such as Algebra, Geometry and Statistics. Geometry is part of the mathematics lessons learned from elementary to college level. Geometry is the branch of science that studies the surface of the earth, in mathematics depicted on the wake flat and wake up space such as square, circle, triangle, cube, beam, cone and so on. In the delivery of mathematical materials, especially Geometry, it is required a good learning strategy. Selection of a good learning strategy for optimal results is an important thing because it can improve students’ creative thinking ability without feeling that the material provided by teachers is very difficult and boring.

Based on the Indonesian teaching reality of Mathematics lesson, the educators and instructors should to create the fun activities, so that students are easy to receive the material. Selection of learning strategies is a teacher strategy. In the learning process, the students should be stimulated in terms of Psychomotor, Cognitive, or Emotional (Affection). That’s why, it requires a learning strategy to provide a significance improvement in learning. Rahayu and Kurniasih, 2014 proposes Active Learning Technique in teaching Mathematics. One strategy that can be used in conveying Geometry material is “REACT”. This strategy means:” *Relating, Experiencing, Applying, Cooperating and Transferring* (Crawford in Yildiz and

Baltaci, 2016) . Students are invited to find their own concepts learned, cooperate, apply the concept in daily life and transfer in new condition.

REACT strategy is the development of contextual learning or usually said as *Contextual Teaching and Learning* (CTL). Contextual learning is a project learning where activities go from class to class and underline the necessity of different skills complete the project effectively, all the way down to a project assessment on the success of that activity (Davtyan, 2014). Contextual learning was officially introduced in Indonesia in early 2001. Context-based approach aims to develop and sustain a sense of wonder and curiosity in young people about the natural world (Demircioğlu in Ultay, 2014). In 2002 trials were conducted in 31 Junior High Schools spread across six provinces. From the results of experiments, it is indicated that contextual learning can improve the interaction of learning in the classroom, making students more motivated in learning and students are more able to think critically. Therefore policy has been taken to expand the application of contextual learning throughout Indonesia.

The REACT methodology gives teachers the tools necessary to create those environments and teachers are very pleasant of REACT methodology and its positive effects on students' attitudes, success and relationship even classmates (Ultay, 2012). Learning based on experience in everyday life and connecting with learning in school is one of the characteristics of contextual learning. As a REACT developer, Cord stated that relating is a form of learning that connects learned concepts to students' knowledge material in a real-life context. Learning becomes a means to connect everyday situations with new information being learned.

Experiencing learning through exploration, discovery and invention, is the main thing in contextual learning. Students are motivated by various methods and learning media. The learning process will happen if students can use tools and materials and other forms of media in active learning. Implementation of concepts and information in meaningful contexts requires students in everyday life and the world of work. In contextual learning, the implementation of the concept is done on activities that are skill. Students do not just study a certain theories, but students are also required to be able to apply the concepts that have been studied into the context of utilization in real life.

Cooperating learning to share experiences, responding and communicating with other students is a basic learning strategy in contextual learning. The experience of working together not only helps students learn teaching materials but also helps students to be consistent with real life. Practical activity is an essential activity that develops the ability to work together. Students work with other students to do practicum activities. The number of students who are members of the group usually consists of 3-4 students. The success of practicum activities in groups requires the division of tasks, observation, opportunity to express opinions and discussions. Therefore, the quality of practical work undertaken in clusters depends on the activity and performance of group members. Students should be able to work together in small groups as well as large groups. Working in pairs or small groups (3-4 people) is an effective strategy to encourage students to work together on teams. Transferring knowledge is done on the basis of knowledge that students have. Teachers can develop student self-confidence by building new learning experiences based on the knowledge and experience that students have. Transferring can be manifested in the form of problem solving in new contexts and situations but still related to the material discussed.

METHODOLOGY

This research was conducted with an Experimental Research. This research was categorized into quasi experimental research. The design used in this research includes three stages, they are: (1) development stage of learning device and research instrument, (2) experimental stage of learning device and research instrument, (3) stage of experiment implementation. Each stage is designed so as to obtain valid data in accordance with the characteristics of variables that are appropriate to the purpose of the study. It assigned two groups; one was taught with REACT Strategy (Experimental) and the Control one with lecture. The population of this research was all the SMP X Pematang Siantar students of class VII junior high school year 2015/2016 consisting of two classes. The election of class VII as the study population is due to the stage of cognitive development of grade VII students has reached the concrete operational stage in accordance with REACT learning. The sample was chosen by two classes with the Cluster Random Sampling technique; group VII (A) and VII (D). Group VII (A) was as the control class, and VII (D) as the experimental class.

The instrument used is to reveal the increasing ability of creative thinking students in the form of a description test of 5 questions. Test the validity of the instruments used in measuring the creative thinking ability of students is referring to the content (Content Validity). Validity test is done by consultation with some experts in the field of mathematics about the problems that have been made by researchers is appropriate to test the ability to think creatively mathematically students. In relation to the test research questions, those were analyzed by descriptive statistical analysis. The data of students' creative thinking ability was analyzed by inferential statistic technique; t- test. Before doing the t- test, it was used normality test and homogeneity of class group data using REACT strategy with conventional group.

RESULTS AND DISCUSSION

The results of research conducted on class VII in Junior High School X Pematang Siantar Indonesia. The test consisted of the initial and final tests, the initial tests were given experimental and control classes with the aim of knowing the student's level of ability that is about geometry. Furthermore the final test is given to the experimental class and control class after the teaching-learning process given by the researcher to the students with the treatment that is for the experimental class using REACT strategy, while the control class used the conventional learning method, the material given for the final test is the material of geometry.

In the initial test of the experimental class is obtained $X = 9,84$ and standard deviation (S) = 1,93 with the highest value 13 and the lowest value 7, whereas the mean value of final test of experiment class $X = 19,88$ and standard deviation (S) = 3,50 with the highest value 24 and the lowest value 12. In the beginning of control class test, it is obtained $X = 10,8$ and standard deviation (S) = 2,20 with the highest value 14 and the lowest value 8, whereas the mean value of final test of control class $X = 15,16$ and standard deviation (S) = 3,03, with the highest value 22 and the lowest value 10.

Normality test of each class is obtained against the control class of values $\chi^2_{count} = 19,98$ and $\chi^2_{table} = 35,42$ or $19,98 < 35,42$ so it can be concluded that the data contained in the control class is normally distributed. While in the experimental class after the calculation obtained values $\chi^2_{count} = 13,88$ and $\chi^2_{table} = 35,42$ or $13,88 < 35,42$ so it can be concluded that the data contained in the experimental class normally distributed. For homogeneity test obtained $F_{count} = 1,16$ and $F_{table} = 1,98$ or $1,16 < 1,98$ so it can be concluded that both variance is homogeneous.

To test the research hypothesis used T test and obtained the result, value $T_{\text{count}} = 9,08$ and $T_{\text{table}} = 2,005$ or $9,08 > 1,9554$, with $df = 48$ so it is obtained $T_{\text{count}} > T_{\text{table}}$ so H_a is accepted or can be understood that there is influence of learning strategy REACT on the ability to think creatively mathematically grade VII students of Junior High School X Pematang Siantar Indonesia.

At the beginning before the learning takes place with the application of REACT strategy students are given pretest. Furthermore after the learning process takes place with the application of REACT strategy, students are given a final test (Postest). Based on the preliminary test score, the mean score of learning outcomes in the experimental class is 9.84 and after the learning with the REACT strategy in the experimental class increases to 19.88. There is a difference between the control class and the experimental class on a presentation basis the average value increases. Differences in creative thinking of this student due to some things such as the inaccuracy of the user learning strategies used by teachers in the class so that students have difficulty in doing the problem is a problem that needs to be addressed solving that occurs at the time of application strategy.

REACT learning strategy is one form of alternative learning that is designed in such a way that it reflects the involvement of students actively in learning mathematics. Thus it can be said that the REACT strategy is a strategy where in the process of teaching and learning teachers allow their students to take an active role in following the learning by positing all the ideas and thoughts of students, in an effort to understand the concepts on learning mathematics.

CONCLUSION

Based on the results of analysis the following conclusions can be drawn:

There was a significant the effect of REACT strategy to the Mathematic achievement of students in Junior High School X Pematang Siantar of Indonesia. The creative thinking in the application of REACT strategy improved the students' achievement in Mathematics. They could make the solving material of geometry which was higher than that of the conventional approach. Meaning that the result of mathematics learning of students in the field of mathematics study on geometry material from experimental group students is better than control group learning result, it can happen because REACT strategy has advantages over conventional learning. The students' mathematical creative thinking ability using REACT strategy is better than the students' mathematical creative ability with conventional learning. Thus, students were enthusiastic in receiving learning through REACT learning strategies.

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