

Research Article

Overview of the Relationship between Creative Teaching and Learning Method and Self-Esteem in Students Learning Mathematics

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Abstract.

Thinking differently refers to a person's ability to come up with ideas to solve problems and logical thinking is a person's ability to verify these ideas into creative solutions. The ability to logically solve problems can be developed by learning mathematics, because mathematics has a strong linkage structural between its concepts that enables students to think logically, critically, and systematically. Creative thinking is very important in this competitive millennial era, where the quality of education is closely related to creativity so efforts to improve creative thinking should start from school. Senior high school students are the main millennials, so high school and equivalent teachers are required to be able to provide education that provides an initial description of creative thinking. Learning innovation through lessons with the Creative Teaching and Learning (CTL) method for high school mathematics teachers and the equivalent can encourage teachers to improve cognitive and didactic pedagogic abilities as well as increase the self-esteem of students in learning mathematics.

Keywords: Creative Teaching, Learning Mathematics, Learning Methods

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1. INTRODUCTION

Education is a conscious and planned effort to create an atmosphere of learning and the learning process so that students actively develop their potential to have spiritual strength, religion, self-control, personality, intelligence, noble character, and skills needed for themselves, society, and the nation [1]. Education is not merely trying to achieve learning outcomes, so the focus of education is how to get the results or learning processes that occur in students. Therefore education should not rule out the learning process [2].

Learning activities carried out by students are influenced by internal and external factors. One of the external factors is the teacher teaching factor, so the role of the teacher is very important to develop student learning activities so that the teaching and

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learning process is more effective [3]. Teachers are part of the four main components in education, namely: Human resources, funds, facilities, infrastructure, and policies. As a strategic component, teachers must have qualities that can utilize other components, so that education effectiveness and efficiency can be achieved. The quality of human resources can be achieved by developing human resources through education and training. The Indonesian government is currently making the education sector a mainstay for improving the quality of human resources, as evidenced by the National Education System Law Number 20 of 200, teacher certification, or the annual awarding of the Ministry of Education and Culture for outstanding and dedicated teachers [4]. The government also provides funds that can be allocated for teacher training programs through the MGMP (Musyawarah Guru Subjects) or KKG (Teacher Working Group) [5]. This is in accordance with the Strategic Plan of LPPM Unisba, namely accelerating the process

of increasing human resources towards the creation of humans in accordance with the demands of development dynamics [6].

Teachers as professional educators are required to master standardized abilities, both cognitive abilities (subject matter) and didactic pedagogical abilities, including the ability to make learning innovations. Lesson Study is a learning innovation that guides the creation of a comprehensive learning community where one of the stages is policy, teachers and students [7,8]. Lesson study is a model of teacher professional development to improve teacher performance carried out jointly by a group of teachers in order to improve teacher performance [9].

The professional ability of teachers has not yet reached the ideal level, so teachers must receive continuous training [10]. The advancement of technology and global information, makes all science tends to be obsolete quickly. This means that if teachers are not trained and do not have access to up to date information, teachers will experience lagging competence. One of the teacher competency updates can be done through learning innovations, including through the Lesson Study of Mathematics learning with the Contextual Teaching and Learning (CTL) approach.

2. METHODS

Lesson Study was born in Japan, after World War Two. The purpose of lesson study is for the professional development of teachers, which is carried out continuously by improving learning in the classroom. The momentum for the popularity of Lesson Study occurred after the birth of an article by Stigler and Hiebert entitled The Teaching Gap

[11]. Lesson Study has been recognized and adapted by several countries in the world, including the United States and Singapore. Teachers and researchers in North America say that Lesson Study is a great idea. Lewis said that lesson study can increase teacher knowledge effectively, strengthen teacher learning communities, and be effective at improving student thinking. Lesson Study is a challenge for the curriculum in the United States which provides a space for students to learn collaboratively [11].

The CTL (Contextual Teaching and Learning) learning model is an idea used by educators that encourages educators to link the material with what is in the real world. Lesson Study with the CTL method in Mathematics is expected to be a learning solution for students to be able to develop logical, systematic and creative thinking skills [12]. The choice of the CTL method provides sufficient opportunities for students to construct their mathematical abilities through Lesson Plans developed by the teacher team through group discussions (peer collaboration) and scaffolding.

Mathematics teaching materials, which are part of the lesson plan, must be made as good as possible, so that they can lead to the formation of student learning communities. The use of the CTL method in the lesson plan is one of the keys to building a student learning community [13]. Rich mathematical tasks can be carried out by presenting story questions with the nuances of daily life or fairy tales, as an effort to stimulate students in preparing students' attitudes and cognitive learning to learn mathematical materials. Teaching materials are designed to promote hands-on activities that reflect student activities. The use of local culture in the preparation of teaching materials can help students master the subject matter and support the development of a conducive learning atmosphere for students.

Open Class is the implementation of learning carried out by the model teacher to be seen and observed by peers, school principals or other people who are willing to observe the course of the learning process. Model teachers are teachers who are willing to open their classes, starting from communicating their learning plans, providing their classes to be observed during the learning process, and reflecting by asking observers for their opinions to improve their learners, especially with regard to student activities during the learning process in class. The model teacher and observers conducted a discussion led by a moderator. In this session, the observer provided input from the results of observations during the learning process, providing alternative solutions for further improvement of learning.

Students participating in the open class were evaluated by filling out a questionnaire to determine the extent of the effect of learning mathematics using the CTL method on students' self-esteem. Self esteem is a person's self-esteem in assessing themselves

[14]. Analysis using a descriptive quantitative approach is presented via graphs. Students who have participated in the open class as respondents are given a questionnaire instrument in the form of a self-esteem scale. Scale items are taken from a predefined scale that is closely related to the activity being carried out [15]. The scale is taken four, namely strongly disagree, disagree, agree and strongly agree. Scale was then changed to an ordinal scale with a range of 1 - 4. The strongly disagree scale has an ordinal value of 1 and the strongly agree scale is ordinal

1. The scale items selected are 10 items, which are grouped into 4 groups of scale items, namely: Ability, Success, Benefit, and Kindness. The item group has sub items that will be evaluated as follows:

(a) Abilities:

- i. Q1: I believe I can solve every math problem.
- ii. Q2 : I can solve math problems as well as friends.

(b) Success :

- i. Q3 : I realized my strengths and weaknesses in learning math so that I know how to learn math well.
- ii. Q4 : I feel proud when I get good grades in math.
- iii. Q5 : I feel proud when I can solve difficult math problems.

(c) Benefit :

- i. Q6 : I can help my family members, when they need help related to math.
- ii. Q7: I can help my friends, when they need help related to math.

(d) Kindness :

- i. Q8 : I studied maths so that my maths grades would be better than other students.
- ii. Q9 : I prepared myself carefully for the math test.
- iii. Q10 : When I come across a math problem that is interesting, I can't rest easy before I can solve it.

(e) The scale is as follows:

- i. SS : Strongly Agree S : Agree
- ii. TS : Disagree
- iii. STS : Strongly Disagree

(f) The scale of this item will be changed to ordinal:

- i. SS : 4
- ii. S : 3
- iii. TS : 2
- iv. STS : 1

3. RESULTS AND DISCUSSION

There are 19 students participating in the open class. The following is the questionnaire result data given after students have finished participating in the open class (Fig. 1 and Fig. 2):

Name	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Student 1	S	S	SS	SS	SS	S	S	SS	S	SS
Student 2	S	S	S	SS	SS	S	S	S	S	S
Student 3	SS	S	TS	SS	SS	TS	TS	SS	SS	TS
Student 4	S	TS	S	S	SS	TS	TS	S	S	S
Student 5	S	TS	S	TS	SS	TS	TS	S	S	S
Student 6	TS	TS	TS	SS	SS	TS	TS	S	TS	TS
Student 7	S	S	SS	SS	SS	TS	TS	TS	S	S
Student 8	TS	S	SS	SS	SS	TS	TS	TS	TS	TS
Student 9	S	S	S	S	SS	TS	TS	S	S	S
Student 10	S	S	S	SS	SS	S	S	S	S	TS
Student 11	SS	S	SS	SS	SS	S	S	SS	S	TS
Student 12	S	S	S	SS	SS	S	S	S	S	S
Student 13	S	S	S	SS	SS	S	S	SS	SS	SS
Student 14	SS	S	S	SS	SS	S	S	SS	SS	SS
Student 15	TS	S	TS	SS	SS	TS	TS	S	S	S
Student 16	SS									
Student 17	TS	TS	TS	S	SS	TS	TS	TS	TS	TS
Student 18	SS	TS	S	S	SS	S	S	S	S	S
Student 19	TS	S	S	SS	SS	TS	TS	S	TS	S

Figure 1: Questionnaire data for students participating in the open class Ability items produce the following graphs.

After gaining experience in learning Mathematics with the CTL method, students agree that they can solve every math problem. And can solve math problems as well as friends. The success item chart (Fig. 3) is as follows:

After gaining experience in learning Mathematics with the CTL method, students realize their own strengths and weaknesses in learning Mathematics so that they know how to learn Mathematics properly. Students feel proud when they get good grades in Mathematics and feel proud when they can solve difficult Mathematics problems.

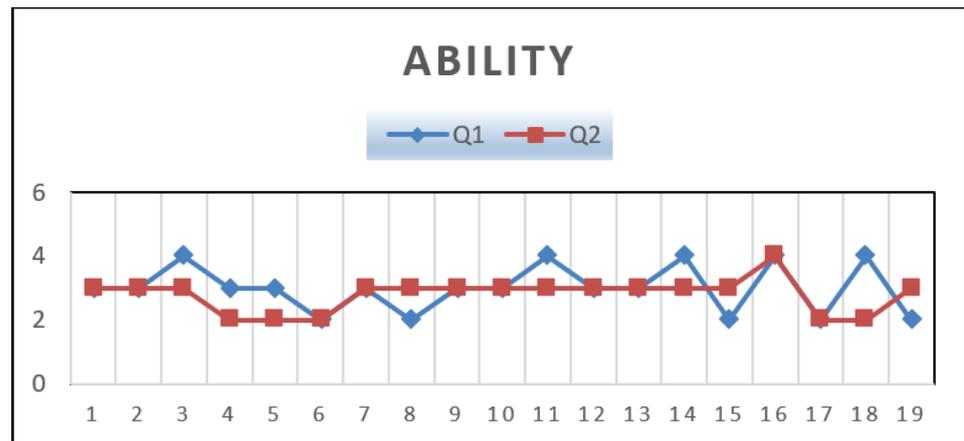


Figure 2: Capability response graph.

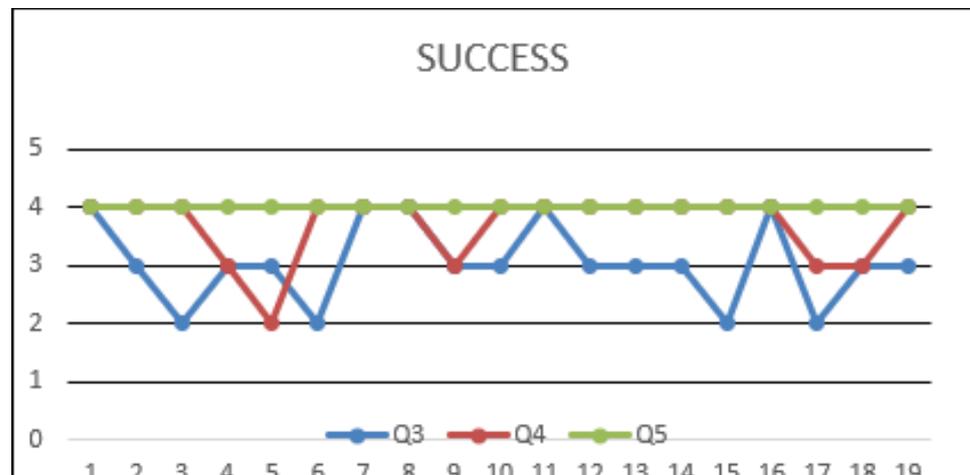


Figure 3: Success response graph.

Students give the same scale for the Benefit item both in response to helping family members when they need help related to Mathematics, and in response to helping friends when they need help related to Mathematics. This is shown in the graph (Fig. 4) as follows:

The scale of the Goodness item obtained by students after gaining experience in learning Mathematics using the CTL method is described in the following graph (Fig. 5):

Students agree to study Mathematics in order to get better grades than other students. Students agree to prepare themselves carefully when facing Mathematics tests, and when they find Mathematics problems interesting, students are not calm before they can solve them.

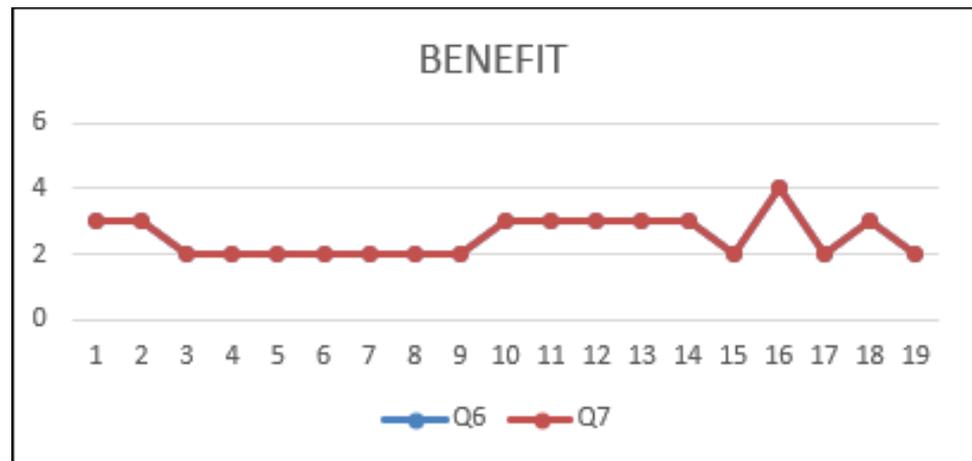


Figure 4: Benefit response graph.

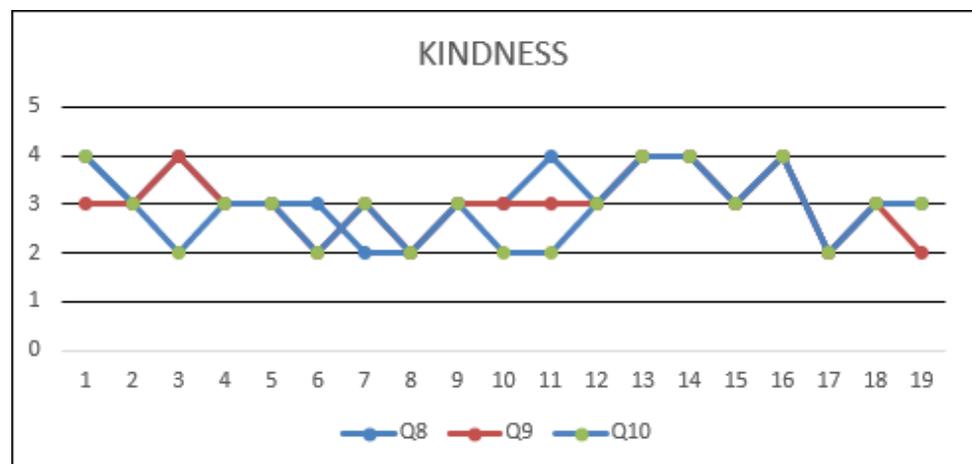


Figure 5: Kindness response graph.

4. CONCLUSION

Students participating in the open class get experience in learning Mathematics using the CTL method. Based on the results of the questionnaire after the open class, with a scale range of 1-4, the results of the analysis show that the Ability item gives an average value of 2.89, the Success item gives an average value of 3.58, the Benefit item gives an average value of 2.53 , and the item Kindness gives an average value of 3.02. The average of all items gives a scale value of 3.06, so it can be concluded that the average student has good self-esteem in learning Mathematics after learning Mathematics using the CTL method.

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