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Student's creative thinking ability in problem-posing activities viewed from self-efficacy

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Abstract

This study aims to determine the completeness of students' creative thinking abilities in knowing students' creative thinking processes in terms of self-efficacy, knowing students' responses to creative problem-solving learning with problem-posing activities, and knowing the obstacles experienced in learning. This research is a mixed-method with councurrent-embedded strategy. The sample of this study was one of class VIII in a Junior High School in Blora. The results showed that: (1) students' creative thinking skills with creative problem solving learning achieve mastery learning; (2) the description of the stages of students' creative thinking in terms of the level of self-efficacy that is on subjects who are in level of creative thinking ability 1 at the level of low and moderate self-efficacy is only able to pass the stage of synthesizing ideas and building ideas. Subjects at the level of creative thinking ability 2 at moderate and low levels of self-efficacy synthesize ideas and build ideas. Subjects at level of creative thinking ability 3 at moderate and high levels of self-efficacy are able to go through all stages of creative thinking, namely synthesizing ideas, building ideas, planning the application of ideas and applying ideas; (3) The use of creative problem solving learning models in which there are problem-posing activities get positive responses from students; (4) The obstacle experienced in this study is that this study when learning is used too much for group discussions.

1. Introduction

Education is an important and fundamental thing for students in Indonesia to be able to compete with other countries from various fields. Therefore Indonesia needs quality education to produce superior, critical, creative and innovative students. With quality education it is hoped that students will have high competitiveness. Competition is also very necessary for students in Indonesia to improve students' creative thinking abilities.

Although having the ability to think creatively is very important for students, in reality, the ability of creative thinking students in Indonesia is still lacking. This can be proven in the TIMSS study results. According to TIMSS 2011 data (Trends in International Mathematics and Science Study) (Mullis, et al, 2012), the reasoning ability of Indonesian students is still low. This shows that some Indonesian students have difficulty in solving reasoning questions. Reasoning questions refer to solving non-routine problems, problems with complex contexts and problem-solving that require many steps of completion. Non-routine questions are problems whose solutions require broader and unusual thinking because the procedure is not as clear or not the same as the procedure learned in class. According to English, as quoted by Pantziara (2009: 43) defines non-routine problems as problems that do not involve routine calculations, but apply certain strategies to find the right solution for those problems. Non-routine questions have a more complex solution than routine problems so students must think of strategies to solve these problems. It can be concluded that student reasoning based on the 2011 TIMSS reasoning domain is still low.

Based on the results of a preliminary study conducted on 32 students, 19 students were able to meet the fluency indicators, 4 students were able to meet the flexibility indicators, 3 students were able

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to meet the flexibility and fluency indicators, there were no students who met the novelty indicators and 11 students did not meet the three indicators. This shows that the students' creative thinking abilities are not optimal and are very reasonable to be researched and explored.

One of the goals of national education according to Undang-Undang Nomor 20 Tahun 2003 is to develop the potential of students to become creative human beings. Creative abilities are expected to be developed in the world of education in Indonesia. But in reality students in Indonesia still have low creative abilities. So it is necessary to explore the students' creative thinking abilities. To explore students' creative thinking abilities, there needs to be an understanding of the creative thinking process. Gie, as cited by Siswono (2007: 28), sets limits that creative thinking (creative thinking) is a series of actions taken by people using their intellect to create new thoughts from a collection of memories that contain various ideas, information, concepts, experiences, and knowledge. In this study, the focus under study is the process of creative thinking.

Based on the results of Siswono's research (2008: 67) explains that the process of creative thinking has stages, namely synthesizing ideas, building ideas, planning the application of ideas and applying ideas to show different characteristics at the level of creative thinking of students and show the development of a pattern in the level the. Each student has a different level of creative thinking. For this reason, a learning activity that can foster or enhance students' creative thinking skills is needed. One of the activities that can be used to foster or enhance students' creative thinking skills is problem posing.

Problem-posing refers to making problems or problems based on information provided and solving problems or problems created (Siswono: 2004). When students make questions, students are required to understand the questions well. To make the question correctly, students need problem posing activity (Kurniasih:2018). This is the first stage in problem-solving. Considering that the questions made by students also need to be solved, of course, students try to be able to make completion plans in the form of making mathematical models to then solve them. In this activity, students are asked to submit problems related to the material being taught. In submitting a problem and solving it requires the ability to think creatively. If this activity is carried out well, students' creative thinking abilities will be explored well as well. According to Siswono (2005) problem-posing, students can explore students' creative thinking abilities even though they have not met all the indicators. Leung (1997: 8) argues that problem-posing is considered as a kind of creativity, even problem posing is sometimes considered as a creative process itself.

Self-Efficacy attitude has an important role for students in students' creative thinking abilities. Self-Efficacy refers to self-confidence in the ability possessed in solving a problem (Bandura, 1986). Students are trained to solve problems through creative thinking phases according to their abilities. Individuals with high confidence can control themselves internally, produce new knowledge, wish to learn continuously, dare to face problems and try to find solutions, be optimistic, confident and able to modify themselves (Sumarmo, 2006: 8).

Efforts that can be made to develop students' thinking skills are to carry out learning by using learning models that are in accordance with the characteristics of the material being taught so that teachers can communicate well, open up diverse thinking insights, enhance creative thinking skills in preparing completion plans, and actively involve students in problem-solving, as well as encouraging student-centered learning. One such learning model is Creative Problem Solving (CPS).

Pepkin (2004) states that the Creative Problem Solving learning model is a learning model that focuses on teaching and problem-solving skills, followed by strengthening skills. Through this creative problem-solving learning, students are allowed to discuss with peers and dare to express opinions at the brainstorming stage and can select opinions and ideas according to the evaluation and selection stages to develop students' creative thinking processes. By accustoming students to work on problems using the steps of creative thinking, it is expected that students' creative thinking abilities will increase. Based on the data above, this study uses creative problem solving as a learning model.

Based on the background above, the need for further research related to "Creative Thinking Ability with Problem Posing Activities in Creative Problem Solving Learning in terms of Self-Efficacy". The purpose of this research is to find out the completeness of students' creative thinking abilities, knowing students' creative thinking processes in terms of self-efficacy, knowing students' responses to creative problem-solving

learning with problem-posing activities, and knowing the obstacles experienced in learning.

2. Methods

The research method used in this study is the combined methods (mixed methods) of concurrent embedded design. The quantitative research design uses the One-Shot Case Study. The description of quantitative research designs can be seen in Table 1.

Table 1. One-Shot Case Study Design Study.

Treatment	Meansurement
X	*O*

Keterangan:

X : Creative Problem Solving learning model

O : student creative thinking ability test results

The population of this experimental study was all students of class X in one junior high school in Blora Regency. This research uses a purposive sampling technique. Taken one class, class VIII G. The class will be given treatment in the form of learning mathematics with a Creative Problem-Solving model with problem-posing activities.

The determination of the subjects in this study is based on the results of the Self-Efficacy scale and tests of students' creative thinking abilities. The results of the student's Self-Efficacy scale are categorized into three groups, namely the high, medium and low groups. From the results of the grouping of students' Self-Efficacy and the results of tests of creative thinking abilities, high and low groups were taken by 2 research subjects while the group was being taken by 3 research subjects. The selected research subjects were then analyzed their creative thinking abilities based on Siswono's research abilities.

The research variable used in this study is the ability of students to think creatively given a Creative Problem Solving learning model with problem-posing activities. The independent variable in this study is the creative problem solving (CPS) learning model with problem-posing activities. The dependent variable in this study was the students' creative thinking abilities. The moderate variable in this study is self-efficacy. In this study, the data used are primary data, where the data in this study are data on the results of student work on tests of creative thinking abilities and self-efficacy questionnaire results data by students. The data source of this research is VIII grade students in one of the junior high schools in Blora Regency in the academic year 2018/2019. There is one class that is the subject of a creative thinking ability test in terms of self-efficacy, while the case that will be elaborated in the study is all students of the experimental class with 2-3 subjects being interviewed from each metacognitive category formed.

In this study, data collection techniques used include observation, tests, interviews, and questionnaires. Observation is done by asking the source, the teacher who teaches mathematics in the sample class that will be used for research and preliminary studies. The test used is a test in the form of a description. The interview method used in this study is unstructured interviews. The self-efficacy questionnaire in this study, researchers used a questionnaire adopted from Haryono's research (2016) using a Likert scale.

3. Results & Discussions

3.1. Normality Test

Based on the test of creative thinking abilities, normality test results show that the significant value of the creative thinking abilities test results is 0.587. Because the value of Sig = 0.587> 0.05, then Ho is accepted. So, it can be concluded that the students' creative thinking ability test data are normally distributed.

3.2. Mastery Learning

The hypothesis is that the results of students' creative thinking abilities in learning creative problem solving can achieve classical learning completeness. The students' completeness criteria are based on the minimum completeness criteria of mathematics subjects that are 65 with the percentage of students who reach the minimum completeness criteria of at least 75%. Based on the results of one-party test results obtained z_count = 2.04124> z_tabel = 1.64, which means the learning outcomes of students in the experimental class have reached classical farther. In line with research conducted by Yuliani, Kanzunnudin, & Rahayu (2018) which shows that the test of students' creative thinking skills with the Creative Problem Solving learning model achieves classical completeness with 78.26% of students getting grades above the minimum completeness criteria.

3.3. Description of Student's Creative Thinking Abilities in Problem Posing Activities Reviewed and Student's Self-Efficacy in Creative Problem Solving Learning

The category of self-efficacy used in this study is the acquisition of self-efficacy questionnaire scores. Based on the self-efficacy questionnaire scores will be classified into three levels, namely: high, medium, and low. Determination of the three levels using a score leveling table as in table 2 below.

Table 2. Score Scoring at the Student Self-Efficacy Level

Score (X)	Self-Efficacy Level
$93 \leq X \leq 120$	High
$57 \leq X < 93$	Medium
$30 \leq X < 57$	Low

Source: (Azwar, 2015: 149)

Keterangan:

X : the total score obtained by students

Based on the categorization of table 2, 2 students meet high self-efficacy, 27 students who meet moderate self-efficacy, and 3 students who meet low self-efficacy. The results of students' creative thinking abilities tests in terms of self-efficacy students get mixed results.

Subjects with high Self-Efficacy category were taken from students with test results on the level of creative thinking ability 3 and the level of creative thinking ability 4. two students who were subjected to research were students with very creative and creative levels because both of these students were in the high Self-Efficacy category.

In the stage of synthesizing ideas, high Self-Efficacy subjects can understand the problem well as a first step to finding ideas. Subjects with high Self-Efficacy are sourced from experiences experienced such as classroom learning experiences and daily learning experiences working on practice questions with their ideas and reading many books. This is following the opinion of Sitepu (2005) which states that the text is one of the sources of learning and learning that provides a sizeable share to expand opportunities to obtain education.

In the idea building stage, subjects with high Self-Efficacy come up with ideas by looking for broad formulas and volumes from known shapes, easy numbers, and topics used to ask questions. This is in line with the results of Siswono's research (2008) that the higher the level of students' creative thinking abilities, the ideas that appear are increasingly complex and complex.

At the stage of planning the application of ideas, subjects with high Self-Efficacy tend to be productive, fluent and confident in choosing ideas to be applied as solutions. Of the various ideas possessed, subjects with high Self-Efficacy choose the ideas that are the easiest to implement, such as choosing the geometric shapes that are easier to calculate and choosing the formulas that are easiest to apply.

At the stage of implementing ideas, subjects with high Self-Efficacy do not feel that the ideas have difficulty and do not make many mistakes. High Self-Efficacy affects one's confidence in his ability to work. At this stage, the subject is convinced that the results did are correct. Haryono (2016) argues that the higher the confidence in self-efficacy the more confident students will be able to complete the task correctly.

Subjects in the category of Self-Efficacy are being taken from students with test results on the level of creative thinking ability 1, the level of creative thinking ability 2 and the level of creative thinking ability 3. The three students who were the subject of research were students with a creative level, quite creative and less creative because the three students were in the Self-Efficacy category is on.

In the stage of synthesizing ideas, subjects with Self-Efficacy can understand the problem well. Subjects can gather important information needed to form ideas. the knowledge possessed by the subject Self-Efficacy is sourced from classroom learning experiences only.

In the idea building stage, subjects with Self-Efficacy are coming up with ideas by looking for broad formulas and volumes from known shapes and easy numbers as a measure and topics used to ask questions. The aspects raised by each subject are different. On subjects with the level of creative thinking ability 3, the aspects raised are flexibility and novelty. Subjects with the level of creative thinking ability 2, aspects raised are novelty, and subjects with the level of creative thinking ability 1, aspects raised are flexibility. At this stage, sometimes subjects with Self-Efficacy are hesitant in expressing their ideas because they doubt their thinking is inappropriate. This is in accordance with the opinion of Hendriana (2014) which states that confidence in one's abilities will affect the level of achievement and performance.

At the stage of planning the application of ideas, students with Self-Efficacy tend to be less productive in choosing their ideas because the ideas formed when building ideas are limited.

Subjects with self-efficacy are choosing the ideas that are easiest to apply or use the only ideas that have been built before.

In the stage of implementing ideas, subjects with self-efficacy are likely to have difficulty implementing their ideas. The basic difficulty experienced is difficulty counting. Subjects with Self-Efficacy do not make mistakes in applying ideas, but tend to be less sure of the results of their work because they feel that they lack the ability to do the problems. In line with the opinion of Siswono (2016) students tend to be less productive in bringing up their ideas because students feel they have never been taught and have difficulty determining the formula to be used.

Subjects with a category of high Self-Efficacy were taken from students with test results on the level of creative thinking ability 1 and the level of creative thinking ability 2. two students who were subjected to research were students with sufficiently creative and less creative levels because both of these students were in the low Self-Efficacy category.

In the stage of synthesizing ideas, subjects with low Self-Efficacy tend to not be able to understand the problem well. Subjects can gather important information needed to form ideas. knowledge possessed by low Self-Efficacy subjects is sourced from classroom learning experiences only.

In the idea building stage, subjects with low Self-Efficacy come up with ideas by looking for broad formulas and volumes from known shapes and easy numbers as a measure and topics used to ask questions. The aspects raised by each subject are different. On subjects with the level of creative thinking ability 2, the aspect that is raised is novelty. subjects with the level of creative thinking ability 1, the aspect raised is flexibility. At this stage, sometimes subjects with low Self-Efficacy are hesitant in expressing their ideas because they doubt their thinking is inappropriate.

In the stage of planning the application of ideas, students with low Self-Efficacy tend to be unproductive in choosing their ideas because the ideas formed when building ideas are limited. Subjects with low self-efficacy choose the ideas that are easiest to apply or use the only ideas that have been built before.

In the stage of applying ideas, subjects with low self-efficacy tend to have difficulty implementing their ideas. The basic difficulty experienced is difficulty counting. Subjects with low Self-Efficacy do not make mistakes in applying ideas, but tend to be unsure of the results of their work because they feel their ability is lacking in working on problems.

3.4. Student Responses to Creative Problem Solving Learning

Based on the results of the questionnaire analysis of student responses at the problem clarification stage, students agreed to the provision of mathematical problems in the form of daily problems. This is shown by the students' interest when given math problems in the form of daily problems. Students are more active in asking questions when given problems in the form of everyday problems.

The next step is brainstorming. At this stage, students agree that if they work on math problems that have more than one step completion, they will be motivated to learn. Students also agree to exchange ideas (discussions) with peers when completing math problems. This is seen when students are given a math problem. They discuss information and what steps they need to take in solving the problem easily. Students can also understand the problem easily. This is in line with the opinion of Bilal (2012) that this activity encourages students to produce the highest number of ideas that are varied and creative and do not limit the freedom of producing ideas so that it allows students to move from one step to another freely after understanding the problem given.

Next is the evaluation and selection stage. students tend to agree when they make a plan for solving the problem and carry out the plan. Students also tend to agree that students always find formulas when working on problems. This is obtained by students when he likes to discuss to determine the steps used to solve problems.

The last stage is the implementation phase. At this stage, students tend to agree that when working on problems, students are free to use the way they like. This can be seen from a variety of ways and answers that students give when solving math problems. Students also tend to agree that they are correcting the steps that have been taken. Based on the recapitulation results of student responses, students tend to agree that the form of questions on the quiz helps students understand the material delivered in class.

Through problem-posing activities, students more easily understand the learning material. This can be shown from the recapitulation results of student responses. Students tend to agree that problem-posing activities during learning help students more easily understand the material being

taught. That is, students tend not to make mistakes in determining the information contained in the problem so as to reduce the occurrence of errors that will arise. This is in line with Syarief & Utami (2013: 65) that problem-posing provides an opportunity for students to achieve a broader understanding of a topic and concepts taught in class. Students also tend to be more active with problem-posing activities. These activities can encourage students to gain new knowledge. Students agree that problem-posing activities can foster a pleasant learning atmosphere.

This study also uses student discussion sheets and teaching aids during learning. Students tend to agree that the language used in student discussion sheets is easy to understand so students can do the activities in student discussion sheets easily. Students tend to agree that students are interested in the appearance of writing and pictures presented in student discussion sheets. Students tend to be active in discussing problems and can better understand the questions in student discussion sheets well.

In addition to learning, students are also given final test questions at the fifth meeting. Based on the recapitulation results of student responses, students tend to agree that the form of questions on the final test of creative thinking skills helps students better understand the material taught in class.

Obstacles Experienced in Creative Problem Solving Learning

Based on observations made by the teacher, the obstacles faced by teachers in implementing learning with the Creative Problem Solving learning model with problem-posing activities are conditions in which students can express opinions. Students need more time to discuss determining the steps used to solve problems. This happens because students are not accustomed to learning with the Creative Problem Solving learning model. Another obstacle faced by the teacher is that students are not used to doing problem-posing activities. The next obstacle is that some students often permit to do activities outside of learning. This can happen because students are not accustomed to working on problems with the model.

Obstacles faced by students in implementing learning with Creative Problem Solving learning models with problem-posing activities are students still feel confused in raising problems (problem-posing), students are not used to discussing learning with Creative Problem-Solving learning models and students' lack of understanding of the problems was given. In line with the opinion of Syarief & Utami (2013) that students who are not sincere in carrying out learning and do not understand the material or information properly make students difficult in raising problems.

4. Conclusion

Based on the description above it can be concluded that students' creative thinking abilities in problem-posing activities are viewed from self-efficacy in creative problem-solving learning reaching classical and individual completeness. Subjects that are in the level of creative thinking ability 1 at low and moderate self-efficacy levels are only able to pass the stage of synthesizing ideas and building ideas. Subjects at the level of creative thinking ability 2 at moderate and low levels of self-efficacy synthesize ideas and build ideas. Subjects at the level of creative thinking ability 3 at moderate and high levels of self-efficacy can go through all stages of creative thinking, namely synthesizing ideas, building ideas, planning the application of ideas and implementing ideas. The use of creative problem-solving learning models in which there are problem-posing activities gets positive responses from students. The obstacle experienced in this research is that this study when learning is too much is used for group discussions, it is not usual to get about the ability to think creatively, it is not usual to use problem-posing activities.

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