

CHAPTER I INTRODUCTION

1.1 Background

In educational institution the word 'creative' is often used. As educators or learners, we have had experiences with creative writing. Teacher supplies flourish with collections of creative activities or books on creative education of various subjects. Such sources often present attractive and pleasant classroom experiences without tackling the primary questions: What is creativity? Where does it originate? What experiences or circumstances permit individuals to become more creative? Creativity is one product of creative thinking. Nowadays creative thinking is a problem that is often found in students at school. This had proven by some of the problems found in SMP Negeri 1 Sipoholon. Students' way of thinking still has not reached the level of creative thinking. Students tend to memorize formulas and use them to solve problems. Also teacher used teacher centered learning to teach. Teachers should be able to stimulate students' creative thinking ways early on. Because, students must be trained them to generate new ideas. Without information on these more basic issues it is complicated for any teacher to create good quality decisions on classroom practices that might promote creativity in students, though group of activities can be useful. Moreover, Mrayyan (2016:82) said that:

The teacher can play an important and essential role in the students development of creative thinking, developing new methods of teaching without relying on one way, and use exciting means in teaching, respect students' mentality care about them and encourage them to display their own abilities.

On the other hand, Suryadi in Ibrahim (2008:90) stated "Trend International Mathematics and Science Study (TIMSS) research for students in eight grade proved that math problems not routinely given to students requiring high-order thinking skills are generally not successfully answered by a sample of Indonesian students. Creative thinking is included in higher order thinking level. It indicates that mathematic has not focused on the development of high-level math skills, one of

which is the ability of mathematical problem solving, in Indonesia as well as in some developed countries.

In line with today's mathematics education challenge that students not only can arithmetic skill but also apply mathematics in their daily life. Moreover, teachers should be able to guide students to apply math to their daily life. It means the teacher has to find a new idea to make it happen. Problem Based Learning (PBL) model is a learning model that teachers can apply to improve students' ability in solving math problems, then students can apply it in their daily life. PBL model is a learning model based on a number of issues that require authentic investigation that is an investigation that required a real solution from the real issues (Trianto, 2011:90). In addition, the problems are based on real-life problems which have been selected and edited to meet educational objectives and criteria (Graff, 2003:2). In this learning model, teacher guides students to describe problem solving into learning steps; teacher give example about the using of skill and strategy are needed to the following task can be solved. Besides, by applying this model, the expected learning that takes place can be more meaningful and gives a strong impression on the students, and can certainly improve the ability to think creatively math of students so that the learning process is always demanding improvement efforts (Surya, et.al., 2017:31).

Based on Silver's opinion, creative thinking ability can be identified by three indicators. First of all, fluency refers to the number of ideas generated in response to a prompt (Silver in Maharani, 2014). Fluency being able to generate a large number of ideas or responses and to make a deliberate effort to continue to generate alternatives even when you are satisfied with what you have. Maharani (2014:123) stated that fluency includes solve the problem and give a lot of answers to the problem or provide many examples or statements related mathematical situation. The second, flexibility to apparent shifts in approaches taken when generating responses to a prompt (Silver in Maharani, 2014). Flexibility being able to generate a variety of ideas and responses, across different categories and to look at things from different points of view. Maharani (2014:123) stated that flexibility includes the ability to use

a variety of problem-solving strategies. Another important indicator is originality of the ideas generated in response to a prompt (Silver in Maharani, 2014). Originality being able to get away from the obvious and commonplace to generate novel ideas and responses. Maharani (2014:123) stated that originality includes using strategies that are new, unique, or unusual to solve problem.

Why are these skills important for students? Fluency skill is important because by having numerous options to pick from the likelihood that one of the ideas will be a breakthrough idea becomes greater. Research shows that the first third of ideas generated are those ideas which have already been tried, the second third are ideas that have previously been considered and the breakthrough ideas lie in the final third where new ideas are generated. A novice user who has developed fluency is able to push past the first “right” answer and generate several more “right” answers in order to benefit from having options to test and select from.

Furthermore, flexibility is important because this ability related to the ability to see situations and generate solutions from multiple perspectives can provide surprising insight and new connections. A novice user who has developed the skill of flexibility is able to make connections across domains and between ideas that may have seemed unconnected. They are also able to look at a challenge or generate options by examining a situation from multiple perspectives. For example: When dealing with customers, being able to see a situation from a customer’s point of view.

Also, originality is important because by deliberately pushing for originality and novelty the likelihood of breakthrough ideas increases. A novice user who has developed originality will be able to offer unusual responses to challenges. These responses will be unexpected and unfamiliar and may often lead to breakthrough solutions.

Based on observation in SMP Negeri 1 Sipoholon which held on January 17th 2018, it was indicate how was tudent mathematical creative thinking ability is low.

This following figures describe how did students solve the problem when the initial test given.

2. Perhatikan gambar dibawah ini!



\overline{BF} is the width of ABCDEFG cuboid with size 5 cm and \overline{AB} is the length of cuboid with size 10 cm more than its width. If the area of ABCD is 45 cm , and its volume is 225 cm^3 , calculate the height \overline{BD} .

\overline{BF} adalah lebar dari balok ABCDEFGH dengan ukuran 5 cm dan \overline{AB} adalah panjang balok dengan ukuran 10 cm lebih panjang dari lebarnya. Jika luas daerah ABCD adalah 45 cm , dan volume balok tersebut adalah 225 cm^3 , hitunglah tinggi \overline{BD} dari balok tersebut).

a. Write the important information of the things which known, asked from the problem above! (Tuliskan informasi penting seperti diketahui dan ditanya)

Dik: $l = 5\text{ cm}$
 $p = 10\text{ cm}$
 $L_{ABCD} = 45\text{ cm}$
 $V = 225\text{ cm}^3$
 Dit: $t_{BD} = \dots ?$ (1)

b. Evaluate the problem above by using your own way! (Selesaikanlah masalah diatas dengan caramu sendiri!)

Jl. $V = p \times l \times t$
 $225\text{ cm}^3 = 10\text{ cm} \times 5\text{ cm} \times t$
 $t = \frac{225\text{ cm}^3}{50\text{ cm}}$
 $t = 4,5\text{ cm}$ (2)

c. Is there any alternative solution? Try to find the other solution as many as possible! (Apakah ada cara lain? Coba tuliskan sebanyak mungkin cara untuk menyelesaikan masalah diatas!)

(3)

Figure 1.1 Student's Answer Sheet in Solving The Problem with One Way

Figure above shows that student is not good enough in understanding the problem. Point (a) shows that student was less competent in explaining the important information. Because there is a part missing. In problem, the length of the Rectangular Prism is edge \overline{AB} is 10 cm more than its width. It means the length of edge \overline{AB} is 15 cm . There are many student have the wrong answer as it. Point (b) shows that student problem solving is still general and used strict rule. Not only in

point (b) but also in point (c) student can't give another alternative solution. It indicates students still use strict rule to solve the problem given.

From 30 students who followed the test, there was only five students who gave the solution more than one way. But the all solution they gave still strict rule and there was not student can give unique way. Students are difficult to make the step of mathematics creative thinking. They can understand the concept and the formula but they were difficult to use the concepts if find problem in real life. It indicates that mathematical creative thinking ability of students in that school is low. It was known by giving the initial ability test which has consisted problem about Cube and Rectangular Prism as the prerequisite topic of Polyhedron.

Table 1.1 Test Result of Initial Ability Test

| No | Criteria | The Number of Students | Percentage |
|----|-----------|------------------------|------------|
| 1 | Very High | 2 | 6,67% |
| 2 | High | - | 0% |
| 3 | Medium | 2 | 6,67% |
| 4 | Low | 17 | 56,67% |
| 5 | Very Low | 9 | 30% |
| | Total | 30 | 100% |

When researcher observed the teacher who was teaching mathematics in class VIII-1. There were many students were passive, only some students with good learning achievement who active in learning. Teacher also confessed that there were many students who passive in each meeting and couldn't solve the problem given confidently. When researcher asked about the model implemented in teaching learning, in fact, teacher still often use conventional model. Teacher never give Student Activity Sheet (SAS) in her class, but she always gave the problem from text book and directly. The teacher always trained her student just to solve the problem, not to trained their brain to think creatively. Therefore, the less of teacher creativity in teaching mathematics can also be one factor the low of mathematical creative thinking ability of students.

When researchers asked students about how their views about mathematics, their answer are math is difficult, math is complicated, math is full with formula, sometime math is boring, and the teacher always give the easy example but give difficult exercises. But some students say that math is interesting, unique, and make them fun. When researcher interviewed six students, four of students responded that mathematics is very difficult and bore.

The most powerful way to develop creativity in your students is to be a role model. Children develop creativity not when you tell them to, but when you show them. When teaching for creativity, the first rule is to remember that students follow what you do, not what you say. All students have the capacity to be creators and to experience the joy associated with making something new, but first you must give them a strong base for creativity. Let your students know that they possess the ability to meet all of life's challenges their job is to decide how hard they will work to meet the challenges. Teachers can be role models for questioning assumptions. You can show students that what they assume they know, they don't really know.

Based on the background described above, the researcher interested in conducting the research entitle " **The Implementation of Problem Based Learning (PBL) Model to Improve Students' Mathematical Creative Thinking Ability In Junior High School**"

1.2 Problem Identification

Identified problems based on the background of research above are:

1. Students' mathematical creative thinking ability in SMP Negeri 1 Sipoholon tends to be low. Based on the description of principal of SMP Negeri 1 Sipoholon, students are not too good in solving problems.
2. Learning process in the classroom is not involving experiential situation so that students do not make many contribution to build their knowledge.

3. The conventional model of teaching in which students are more passively learning, is still conducted in learning process so that students cannot enhance their ability in solving problems independently.

1.3 Problem Limitation

Problem limitation of the research must be clear and focused on to provide a through description in research. The research is limited on students' mathematical creative thinking ability in SMP Negeri 1 Sipoholon using Problem Based Learning for Polyhedron (Cube and Rectangular Prism).

1.4 Problem Formulation

Based on the background above, the writer formulates the problems as follows:

1. How does Problem Based Learning model improve students' mathematical creative thinking ability in junior high school?
2. How does the level of student activity by implementing Problem-Based Learning model?

1.5 Research Objectives

The purpose of the research conducted on the students of class VII SMP Negeri 1 Sipoholon, Semester II Academic Year 2017/2018 with the basic subject matter of Polyhedron are:

1. Improving students' creative thinking ability in mathematic through Problem Based Learning in junior high school.
2. Knowing the level of student activity by implementing Problem-Based Learning model.

1.6 Research Benefit

1. For Students

Improve student's creativity in solving problem of mathematics

2. For Teacher

Opening teacher's insight about the important of creativity for student and how to increase the student's creativity.

3. For School

As a consideration for school to make an innovation learning model especially in increasing student's creative thinking ability.

4. For The Author

This study is expected to be a positive feedback in preparing themselves as prospective educators.

1.7 Operational Definitions

1. Learning is a process or effort which done by each people to gain a permanent is a permanent change relatively in the behavior, like knowledge, skill, attitude or positive value as the result of the experience or training which is done continuously.

2. Models of teaching is a plane or pattern that can be used to shape curriculum, to design instructional materials and to guide instruction in the classroom and other setting. They are really models of learning as help students acquire information, ideas, skills, values, ways of thinking and means of expressing themselves, we are also teaching them how to learn.

3. The Problem Based Learning model is a learning approach where students work on authentic issues to build their own knowledge and higher-order thinking skills, and get self-reliant and self-confidence.

4. Creative thinking is mathematical thinking in solving mathematical problems. If in solving math problems routine, and students can complete in a manner different from that taught by teachers in the classroom, then these students can be said to be creative in mathematics.