CHAPTER I
INTRODUCTION

1.1. Background

Education is one way to develop the world in the future. By education, people will be informed and able to develop itself to be more advanced, or to compete in the future. Therefore, every human being is expected to get a good education. According to Buchori (in Trianto : 2009) said that, "pendidikan yang baik adalah pendidikan yang tidak hanya mempersiapkan para siswanya untuk suatu profesi atau jabatan, tetapi untuk menyelesaikan masalah-masalah yang dihadapinya dalam kehidupan sehari-hari". A good education is the education that not only prepares students for something profession or position, but to resolve the issue faced in everyday life.

One of the main focus in the world of mathematics education at this time is the development of mathematical creative thinking abilities. This is because mathematics is one of the basic science that have an important role in the development of science and technology. Science and technology are rapidly demanding human resources that creative and qualified. For dominate and creating technology in the future, needed understanding of math from an early age.

The purpose of learning mathematics is to establish a person's thinking patterns so they can think critically, creatively, logically and systematically. Therefore, the learning of mathematics should be designed such that it becomes an appropriate means to develop the ability of creative thinking mathematically. This design can be helped with the selection of the model or approach appropriate learning in mathematics.

The fact that happens now is that teachers and students is difficult to develop a mathematical creative thinking abilities in mathematics. In general, teachers do not present the exercise to the student to think creatively for any given exercise only results-oriented without seeing how the process is run by students.

While the students themselves are not familiar with the exercise or problems that require creative thinking to answer.

This occurs because of the approach, models, methods, or specific strategies used by the teacher in the learning process is still traditional, and less provides an opportunity for students to develop thought patterns in accordance with their respective capabilities. As a result of creativity and mathematical thinking skills that students can not develop optimally. Therefore, teachers needs to choose the approach or model that can help develop students' mathematical mindset.

Joyce and Weil (in Fathurrohman : 2015) defines, "model pembelajaran sebagai suatu perencanaan atau suatu pola yang digunakan sebagai pedoman dalam melaksanakan pembelajaran di kelas atau pembelajaran dalam tutorial dan untuk menentukan perangkat-perangkat pembelajaran." Learning model is a planning or a pattern used as guidance in implementing the learning in the classroom or learning in tutorials and to determine learning devices. It means that the learning process can not be separated from the model or approach of learning.
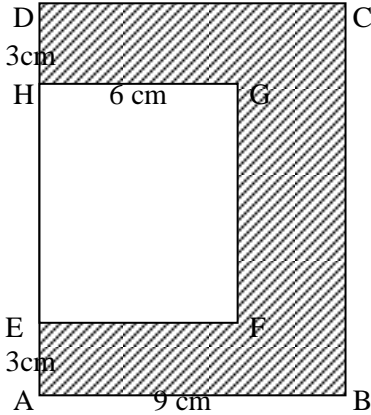
Creative thinking is an important human characteristic. It is the best thought as a process, requiring a mixture of ingredients, including personality traits, abilities and skills. In enhancing the ability of creativity in solving problem, Silver (in saefudin: 2012) indicates three criteria, namely fluency, flexibility, and originality (novelty).

Based on the observation in SMP Negeri 1 Sipahutar, which was held on January, 25th 2017, was found that mathematical creative thinking ability of students in that school is low. It was known by giving test which was consisted problem of rectangle and square.

From the answer given by student obtained (seen from indicators of creative thinking) :

1. Fluency indicator

Look at this plane !

D
3cm
H   6 cm   G

Calculate the area of shaded part !
14 cm   (Hitunglah luas daerah yang diarsir!)

E
3cm
A   9 cm   B

a)   Write the important information or the things which known and asked from the problem above!

Panjang ☐ Besar   : 14 cm
lebar ☐ Besar   =   9 cm
Panjang P☐ kecil = 8 cm
panjang ☐ kecil   = 6 cm

At point (a), student were less competent in explaining the important information.

b)   Evaluate the problem above by using your own way!

L☐B - L☐k   = (P×ℓ) - (P×ℓ)
            = (14×9) - (8×6)
            = (126 - 48) cm
            = 78 cm²

Student problem solving is still general and strict rule.

c)   Is there any alternative solution ? Try to find the other solution as many as possible.

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 di atas)

Student can not give another alternative solution.

Figure 1.1. Student's answer sheet in solving the problem with one way

From 31 students, there are four (4) students who tried to answer question more than one way. And 27 other students are not able to give more than one way. Figure 1.1. above shows the test results of one of the students. According to the fluency indicators show that the test results of students above still use a common completion and not accordance with the stages of the workmanship problem.

2. Flexibity indicator

Figure 1.2. Student's answer sheet in solving the problem more than one way

Figure 1.2. shows the test results of one of the students who try to solve the problem more than one way. According to the indicators of flexibility show that student test results not yet generating ideas of problem solving and not present concepts in different way. The results of this test has not shown the ability of the student to see the problem from the different viewpoint.

3. Originality indicator

Figure 1.3. Student's answer sheet in solving the problem more than one way

Figure 1.3. also shows the test results of one of the students who try to solve the problem more than one way. It is also not show the ability of student to see the problem from the different viewpoint. So according to the originality indicator, student test results above not yet give new ideas to solve the problems because this test result not fulfill flexibility indicator, so automatically student can not give new ideas to solve it.

From the explanation above, the following table will show the result of the initial ability test.

Table 1.1. Test Result of Mathematical Prior Knowledge

No	Criteria	The Number of Student	Persentage
1	Very High	2	6,7 %
2	High	-	0 %
3	Medium	2	6,7 %
4	Low	17	56,7 %
5	Very Low	9	30 %
	Total	30	100 %

The result of observations on January 25th 2017 also refers to the learning process of teachers and students in class VIII-3. Researchers considered that many of students that found to be passive and only a few students were active during the learning process. The learning process that conducted is still focused on the Teacher Center and teachers give more attention to students who are active. In giving an example of the problem, teachers only give two examples of questions that correspond to KTSP books that they use, and after that, teachers directly delegated entirely the exercises to the student.

When researchers asked students about how their views about mathematics, their answers are as follows:
- ✓ Math is difficult.
- ✓ Math is full with formula.
- ✓ Math is boring.

✓ The math teacher always give an easy example, but give tasks / exercises that difficult.

From the interviews result that have been researchers did, there are only two students who are interested in mathematics.

When researcher asked about the model implemented in teaching learning, in fact teacher still often use conventional model. Therefore, the less of teacher creativity in teaching mathematics can also be one factor the low of matnematical creative thinking ability of students.

One of effort to improve the creative thinking of students is make the meaningful learning. Tan (2003: 16) said that problems can engage curiosity, inquiry and thinking in meaningful and powerful ways. Education needs a new perspective of searching for problems and looking at problems.

Based on explanation above, Problem Based Learning is one of model of teaching which provides problem in the initial learning. Fathurrohman (2015:112) argues that:

> "Problem Based Learning (Problem Based Instruction) adalah pembelajaran yang menggunakan masalah nyata (autentik) yang tidak tersruktur (ill-structured) dan bersifat terbuka sebagai konteks bagi peserta didik untuk mengembangkan keterampilan menyelesaikan masalah dan berpikir kritis serta sekaligus membangun pengetahuan baru. Berbeda dengan pembelajaran konvensional yang menjadikan masalah nyata sebagai penerapan konsep, PBM (Pembelajaran Berbasis Masalah) menjadikan masalah nyata sebagai pemicu bagi proses belajar peserta didik sebelum mereka mengetahui konsep formal.

Learning by using real problems (authentic) and unstructured is open as a context for students to develop problem-solving skills and help students to think critically while building new knowledge. Problem Based Learning makes a real issue as the trigger for the learning process of learners before they know the concept of formal, whereas conventional learning makes a real issue as the application of the concept. Based on the explanation, Problem Based Learning is one of model of teaching which provides problem in the initial learning.

To improve mathematical creative thinking of students, it's best if we combine the model of problem based learning with open-ended approach. Shoimin (2014: 99) argues that:

> Pembelajaran dengan problem (masalah) terbuka artinya pembelajaran yang menyajikan permasalahan dengan pemecahan berbagai cara (flexibility) dan solusinya juga beragam (multi jawab, fluency). Pembelajaran ini melatih dan menumbuhkan orisinalitas ide, kreativitas, kognitif tinggi, kritis, komunikasi-interaksi, sharing, keterbukaan, dan sosialisasi.

Learning with the open-ended problem learning means that presents the problem by solving a variety of ways (flexibility) and the solution also varied (multi responsible, fluency). This learning to train and cultivate originality, creativity, higher cognitive, critical, communication-interaction, sharing, openness, and socializing.Mathematical activities generated by open-ended problems are very rich and subtle so as teachers can evaluate student's higher order- thinking skills. In a sense, open-ended problem is a good start for creating the first study lesson for the purpose of study in lesson study approach (Inprasitha, 2006:171).

So, in this research the researcher will use model of problem based learning combine with open-ended approach to improve the mathematical creative thinking ability. This combination can make the learning process will be more memorable and meaningful for students, because it invites students to acquire knowledge and new infomation independently that can come from anywhere, anytime, and do not rely on the information in the direction of the teacher. The step of the open-ended approach include : (1) participation (2) motivation (3) questioning (4) thinking (5) discussion (6) solutions (Munroe 2015:100).

Based on the explanation above, so the researchers interest in conducting research with title " The Implementation of Problem Based Learning with Open-ended Approach to Improve The Mathematical Creative Thinking Ability in SMP Negeri 1 Sipahutar."

1.2. Problem Identification

From the descripiton of the background obtained by the identification of problems items, namely :

1. Learning mathematics is often associated with memorizing formulas lessons.
2. In the course of learning, students are not usual to be involved in solving particular problems that require creativity.
3. Student's creative thinking ability in problem solving is still low.
4. Students generally less actively participate in the learning process in the classroom.
5. The learning model implemented by teachers not improve students' mathematical creative thinking ability.

1.3. Problem Limitation

Based on the identification problem above there is a wide scope of issues, so this research is limited to know the following :

1. The activity participate of student in IX-3 SMP Negeri 1 Sipahutar.
2. The mathematical creative thinking ability in IX-3 SMP Negeri 1 Sipahutar.

1.4. Problem Formulation

Based on the background that has been stated above that the formulation of the problem in this research are :

1. How is the improvement of student mathematical creative thinking ability in IX-3 SMP Negeri 1 Sipahutar by implementing Problem Based Learning Model with Open Ended Approach.

1.5. Research Objectives

The objective of this study is :

To improve the student's mathematical creative thinking ability by implementing problem based learning model with open-ended approach.

1.6.   **Research Benefit**

1. For Students

   Improve the 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 innnovation learning model especially in increasing student's creative thinking ability.

4. For The Authors

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

1.7.   **Operational Definition**

   The variable of this research are define as below :

1. Problem-based learning model with an approach open-ended is the model of mathematics learning that emphasizes on problem solving in real life to enhance the ability of creative thinking and problem solving skills of students who conducted with 5 phases, namely Orient students to the problem (1), Organize students for study (2), Assist independent and group investigation (3), Develop and present artifacts and exihibits (4), Analyze and evaluate the problem solving process (5) by combining the Open-Ended approach as an approach which emphasizes on understanding the concepts in the problem solving process.

2. The mathematical creative thinking ability is the ability to identify the problem and being able to see the problem from different viewpoints, thus providing a quick response to solve problems and generate new ideas.