

CHAPTER I

INTRODUCTION

A. Background of the Study

Mathematics is one of the science that demands critical thinking, logical, and systematic, as well as concerning the problems that require resolution of comprehensively and correctly. Mathematics has been introduced to us since childhood, started from known numbers, how to count, until operate the complex numbers. Students dislike mathematics because this subject is very difficult to understand, so many students who are unable to solve the problem in mathematics.

Students less knows about problem which is carried out, so they difficult to solve its problems. Students didn't read the question carefully, they are not realizing what is known and what is asked and too quick start calculations. Students are not planning the solving way, they are not starting with what was asked and they are not connecting the general theory with problem worked. Students do not solve the problem in detail and students do not examine again the truth of his calculations.

Therefore, students factor about that difficulty need to be eliminated by having the mathematical proficiency. According to Kilpatrick (2001), mathematical proficiency that having a student to successful mathematics learning are: (1) conceptual understanding; (2) procedural fluency; (3) strategic competence; (4) adaptive reasoning; and (5) productive disposition. One of the

mathematical proficiency that needs to be developed is a strategic competence. Strategic competence refers to the ability to formulate, present, and solve mathematics problems. Mathematics teacher is obliged to facilitate the development of five mathematical proficiency on each student that he taught.

In addition, student's difficulty in mathematics learning is caused on the fault of teachers in selecting learning approaches. The various learning approaches can reduce the satiation of students and can increase the ability of students in learning mathematics. A good learning approach is a learning approach to suit the material to be conveyed, the students condition, facilities and infrastructure are available as well as the mastery of competencies.

The approach of learning mathematics which usually be applied by teacher is conventional learning approach Teacher delivers material to students without know ing the extent of ability obtained by students. The teacher is very dominating in the learning process so that most students were bored. The students do not have the opportunity to find their own answers so that students have not been able to understand the concept of the material are being studied.

Based on the result of middle semester test grade VII Junior High School 1 Surakarta, where there is difference learning achievement between VIIA-D and VIIE-H classes get difference learning treatment. Students in class VIIA-D achieve success 78,85% while not success 21,15% and in class VIIE-H achieve success 75,96% while not success 24,04% where KKM mathematics in Junior High School 1 Surakarta is 80. So that in mathematics learning

treatment that applied should be appropriate student's condition and material are being studied.

Therefore, the need for a renewal of mathematics learning approach that student feel was more interested and motivated in the following mathematical learning. *Polya* problem solving approach through learning *Group Investigation* strategy is one of the various approach of learning that can be applied in learning mathematics. Problem solving by using systematic steps as recommended by George Polya was considered very effective and essential given to students so that they are trained in solve problems. One way to teach students to problem solve is to teach the fourth step processes developed by Polya: 1) understand the problem, 2) devise a plan, 3) carry out the plan, and 4) look back (Kousar Perveen, 2010:9). While in strategy of *Group Investigation* (GI), there are three main concepts, namely: research or inquiry, knowledge, and the dynamic of the learning group (Udin S. Winaputra, 2001:75). Thus, through the learning strategy of *Group Investigation* (GI) that completing with systematic steps in *Polya* problem solving, students can exchange ideas in order to solve problems such as making it easier for students to take the appropriate steps to get the most appropriate solution.

Based on the above background of problem, the researchers will conduct research about implementation of *Polya* problem solving approach in mathematics learning through *Group Investigation* strategy based on strategic competence for grade VII Junior High School 1 of Surakarta.

B. Problem Statement

Based on the background of study, the problems can be identified as follows:

1. Most of students to experience difficulty in study of mathematics.
2. Learning mathematics is still using conventional learning approach
3. Proficiency of student's strategic competence in learning mathematics is still weak

C. Limitation of the Study

This study is limited to the following:

1. Approach of learning used in this research is limited on the approach of *Polya* problem solving through *Group Investigation* strategy on experimental class and the conventional on control class.
2. Mathematical proficiency of students is limited to strategic competence. Students have high strategic competence if he is able to understand the problem, presents a mathematical problem, choose the right formula or method to solve the problem, check the correctness of problem solving has been obtained.
3. Mathematics learning achievement on this research is limited on the outcome learn after the delivery of the set material and their use in problem solving for junior high school grade VII even semester.

4. Indicator used to analyze whether there are differences in achievement between *Polya* problem solving approach through *Group Investigation* strategy and conventional learning is limited to the set material test.

D. Formulation of the Problem

Based on background, identification, and limitations of problems above the formulation of problem that will be examined in this study are as follows:

1. Is there difference effect between the *Polya* problem solving approach through *Group Investigation* strategy and the conventional learning to student's mathematics achievement?
2. Is there difference effect between student's strategic competence proficiency to student's mathematics achievement?
3. Is there any interaction between the learning approaches and strategic competence proficiency to student's mathematics achievement?

E. Objective of the Study

In accordance with the above formulation of problems, the objective of this study in general is to get information about the effectiveness of the mathematics learning with *Polya* problem solving approach through *Group Investigation* strategy. In particular, the objectives to be achieved from this study as follows:

1. to analyze differences effect between *Polya* problem solving approach through *Group Investigation* strategy and conventional learning to student's mathematics achievement,
2. to analyze differences effect between strategic competence proficiency are divided into three groups: low, medium, and high to student's mathematics achievement,
3. to analyze the interaction between learning approaches and student's strategic competence to students' mathematics achievement.

F. Benefit of the Study

There are two kinds of benefit of the study, they are as follows:

1. Theoretical benefit
 - a. This study give feedback to teacher as effort to improve the learning process.
 - b. This study give contribute in the education field as effort to improve the learning process.
2. Practical benefit
 - a. For students, this study can increase the ability of strategic competence in following the learning process and can improve learning achievement.
 - b. For teachers, this study give information for prospective teachers and mathematics teachers in determining appropriate learning approaches to be applied in teaching and learning and it give feedback to

mathematics teachers about the various advantages and disadvantages of learning using problem solving approach of *Polya* through *Group Investigation* strategy on junior high school grade VII on the set material.

- c. For schools, this study can be material consideration to improve the effectiveness and efficiency of the management of the school in order to improvement mathematics learning approaches in schools.
- d. For authors, can get hands-on experience in applying mathematics learning using problem solving approach of *Polya* through *Group Investigation* strategy.