CHAPTER I

INTRODUCTION

A. Background of the Study

Since childhood we have been introduced to mathematics lesson which is one of the important sciences for life. However, many children feel that mathematic are a difficult subject. The assumption that mathematics is difficult subject because there are several factors behind the background, such as students who are lazy to learn mathematics, material that is considered difficult, and less accuracy in using model of learning by teachers. The three factor causes some students tend to have less understanding causing less satisfactory achievement.

Concept understanding of students will affect the student's reasoning in solving a mathematical problem. Adaptive reasoning is one of the reasoning that needs to develop in solving a mathematic problem. Adaptive reasoning refers to the capacity to think logically about the relationships between concepts and situations, the ability for reflective thinking, the ability to explain and the ability to provide justification (Djamilah, 2011:3).

Many students are afraid to solve mathematics problems, so teachers should guide students to solve a mathematic problem. It makes students' understanding relatively low. That condition also supported by the results of TIMSS (*Trends in International Mathematics and Science Study*). In TIMSS (Ina et al. 2011: 6) International Results in Mathematics, the average overall grade 8 in Indonesia is 386, far from the midpoint of TIMSS are 500. Beside

that TIMSS (Ina et al. 2011: 162) says that Mathematical average in term of cognitive dimensions that include understanding 378 (31%), application 384 (23%) and reasoning 388 (17%). Cognitive aspects of the TIMSS showed average of understanding 35%, application 40% and reasoning 25%.

Student's reasoning can develop if they are active during the learning process. In this case teacher's role in learning can affect the student's reasoning. One of them is used an appropriate learning model, so it makes students more active and strengthens understanding of material. The teacher use inappropriate models of learning will affect student's mathematics achievement.

Problem Solving model using Numbered Heads Together (NHT) is one of the learning models that can be used in learning mathematics. This model engages students to solve a problem together and draw conclusions from the problem.

In Problem Solving, there are four steps, which are understanding the problem, planning the problem solving, implementing plan, and checking the result obtained. While the Numbered Heads Together (NHT), there are four steps, namely numbering for each group, the teacher gives a problem, students think together, and students answer questions in a systematic and logical (Trianto, 2007:62-63).

Based on the above problems, the researchers will conduct with research on the implementation of the Problem Solving model using

Numbered Heads Together (NHT) viewed from the student's adaptive reasoning in mathematics learning.

B. Identification of Problem

Based on the background of the problem which has been described above, some problem can be identified as follows:

1. Lack of level understanding students in learning mathematics.
2. Most students are afraid trying to solve mathematics problems.
3. Teacher using conventional model.

C. Limitation of Problem

Based on the selection of the problems above , problem that will be studied more and directed the researcher limit the issues as follows:

1. A Learning model used Problem Solving model using Numbered Heads Together (NHT). This model begins from giving the students with a problem to measure how far students' understand the material.
2. Mathematical proficiency of students is limited to student's adaptive reasoning in mathematics, it's mean that student's adaptive reasoning before getting treatment Problem Solving model using Numbered Heads Together (NHT).
3. Learning achievement is limited to student's mathematics achievement on the subject of a circle.

D. Formulation of the Problem

Based on the limitation problems above, problems in this research can be formulated as follows:

1. Is there a difference effects between Problem Solving model using Numbered Heads Together (NHT) and the conventional learning model for student's mathematics achievement?
2. Is there a difference effects between low, medium, and high student's adaptive reasoning to student's mathematics achievement?
3. Is there any interaction between learning model and student's adaptive reasoning to student's mathematics achievement?

E. Research Purposes

The purposes of this research are as follows:

1. To identify and analyze whether there are differences effects between the Problem Solving models using Numbered Heads Together (NHT) and the conventional learning model to students' mathematics achievement.
2. To identify whether there are differences effects between low, medium and high student's adaptive reasoning to student's mathematics achievement.
3. To identify whether there are any interaction between learning model and student's adaptive reasoning to student's mathematics achievement.

F. The Benefits of Research

This research is expected to be useful for theoretical and practical importance, namely:

1. Theoretical benefits

   This research is expected contribute to the study of mathematics primarily to determine the difference student's adaptive reasoning by the Problem Solving model using Numbered Heads Together (NHT).

2. Practical benefits

   a. For teachers, this research can provide information and advice for teachers to improve student's achievement.

   b. For schools, this research is useful to develop a culture of cooperation and improve the quality of teaching, quality of teachers and in the end the quality of the school.

   c. For students, this research is useful for developing student's adaptive reasoning in learning mathematics.