CHAPTER I
INTRODUCTION

A. Research Background

Programme for International Student Assessment (PISA) in 2012 has revealed that assessment result of Indonesia performance in science was in the second lowest compared with the other country (Organization for Economic Co-operation and Development, 2014). Compared with the Asean country, Indonesia was placed after Singapore, Vietnam and Malaysia. This result shown that our educational instruction has not been successful enough to evolving students' achievement especially in science. Sutikno (2004) in his research state that students tending to prefer a more favourable science classroom learning environment than the one which they actually experienced, this is one of proof that science learning have not fill both assessment and the students expectation yet, so that we need to found a breakthrough to overcome that problem.

There are so many problems that encountering educational instruction, one of them is as stated by Slavin (1985) that students differ in their rates of learning; instruction at a single pace is bound to leave some students behind and to hold back students who could progress at a much more rapid rate. This is a particular problem in science instruction, which students are different each other but the class was run with a single pace. This condition is not fair and need to be solved in order to reach the equal and fair instruction for heterogeneous class.

Prashnig (2007) in his book state that there is no learning difficulties, but teaching difficulties does, this statements means that students who considered as not capable to learn or do their task actually not because they are really not capable, but because they are heterogeneous. There is ample evidence that individuals differ in how they prefer to take in, process, and acquire new information (Hatami, 2013). The heterogeneous class was not only in terms of student's rate of learning, but also in term of students learning style. Learning styles are characteristic preferences for alternative ways of taking in and processing information (Litzinger, 2007). Learning style addresses the approach to learning and the manner that individual learns best (Popoola, 2014).

A goal of instruction should be to equip students with the skills associated with every learning style category, regardless of the students' personal preferences, since they will need all of those skills to function effectively as professionals (Felder, 2005). Proponents of learning styles assessment in instruction believe that learning styles can be measured and used as a valuable teaching tool inside the classroom (Hatami, 2013). One of the most important uses of learning styles is that it makes it easy for teachers to incorporate them into their teaching, teachers can incorporate these learning styles in their curriculum activities so that students are able to succeed in their classes (Gilakjani, 2012). A mismatch between the method used to present course materials and a student's learning style can adversely affect the student's performance in learning (Leung, 2014), then it is important for students to recognize their learning style (Popoola, 2014). By having different learning style, students will have their own way in processing information that teacher give, thus, teachers have to adjust their approaches in teaching to give a fair opportunity for student to catch the idea of learning.

Giving a fair teaching is not simple, hence the variety of learning style are so many and teacher cannot just split the class by following student's learning style. But, by analyze and considering students' learning style in the earlier class, teacher will have a higher opportunity to make a better lesson plan and then could increase student achievement. In supporting the attempt to improve student achievement, many teachers do the innovation with their teaching approach, one of the familiar approach is cooperative learning. Team Assisted Individualization (TAI) is one model of cooperative learning approach that combines cooperative learning with Individualization programmed instruction. The steps of the model gives the opportunity for the student to learn individually based on their capability as well as learning in group to help them self and their group members to improving their achievement. Awofala et al. (2013) have found that TAI strategy was effective to improve students' achievement. TAI was promoted as the learning model that able to solve students who have problem in heterogeneous class and prior knowledge by applying individual and cooperative work. The

requirement to master the earlier material will make the student work on their own pace and learning style to achieve concept mastery.

The attempts to improving student achievement by considering students' heterogeneity (learning style) need to be tried through a research in order to give a proof for the other teacher that considering students' heterogeneity is the other way to give an effective learning experience as well as improving students' achievement. Thus, in this opportunity the author is going to conduct a research entitled "Students' Conceptual Understanding in Learning Optic Based on Learning Style using Team Assisted Individualized (TAI)".

B. Research Problem

The research problem of this study is "How is Students' Conceptual Understanding based on Learning Style using Team Assisted Individualization (TAI) in Learning Optics?".

C. Research Question

Elaborating the research problem, the research attempts to explore the following questions:

1. How is the profile of students' learning style within one class?
2. How are students' conceptual understanding achievement in learning optic after implementing Team Assisted Individualized (TAI)?
3. Which learning style that that more effective to improving students' conceptual understanding in learning optics after using Team Assisted Individualized (TAI)?

D. Research Objective

The research objectives are described as follows:

1. To identify the profile of students' learning style within one class.
2. To analyze students' conceptual understanding achievement in learning optic after implementing Team Assisted Individualization (TAI)

3. To identify which learning style that more effective to improving students' conceptual understanding in learning optics after using Team Assisted Individualized (TAI)

E. Limitation of Problem

In order to make the research become more focused, the problem is limited as follow:

1. Cooperative learning model that being analyze is about Team Assisted Individualized. The steps and the learning activity were adjusted to be fit with science lesson.

2. This study is limited for only discussing students learning style and the other factor such as the characteristic of material that would affect them. This research not including the analysis of teacher's teaching style as the external factor that may affect students' learning process.

3. Learning style that used as bases of this investigation are based on VARK Learning Style Questionnaire Version 7.8 authored by Neil Donald Fleming (2014) which are mainly consist of Visual (V), Aural (A), Read/Write (R) and Kinesthetic (K).

4. Conceptual understanding that being investigated in this research are limited into 3 of 6 cognitive dimension based on Revised Bloom Taxonomy (Anderson et al., 2001), they are remembering (C1), understanding (C2) and applying (C3). The consideration are based on the cognitive dimension that available on core competence no 3.7.

5. The topic that investigated and analyzed in this research is only for optic concept, limited by Core Competence No. 3 and Basic Competence No. 3.7 for 8th grade of Junior High School that are attached in Kurikulum 2013 document. The sub topic that being delivered are about characteristic of light, Images formed by reflection and refraction, images formed by mirrors and its characteristics, images formed by lenses and its characteristic, eyes as optical device, optical devices in daily life. The other kind of materials are not included in this research, but it has the possibility to be investigated in the other research.

F. Research Benefit

The results of this study are expected to provide:

1. Teachers

   This research would provide the reference and proof of making a consideration about student heterogeneity within the class. There might several kind of heterogeneity, but the easier and most affecting is about learning style. In one class there would be several kind of learning style, it would be better if teacher analyze student learning style in the beginning, and then make a learning activity that fits with them. This research would be showing the experiment and why teacher need to consider it.

2. Students

   The consideration and analysis of students' learning style would give a benefit for the students themselves. First, they will aware of their own learning style, thus, it would be easier to find the way how to catch the material better than before. Second, they would be given a better attention by the teacher, because teacher already know that they are different, so teacher will try to adjust, not forcing them. Third, by understand each other between student and teacher, the learning activity would become more enjoyable and appropriate, then the achievement would be increase.

3. Another researcher

   This research may be developed to becoming another further research. Because this research was focused on the effect of different learning style in a certain class. The data that already taken was about students' learning style, but what about teacher teaching style? Is that also will affected to the students' conceptual understanding? What about various kind of teacher? Which teaching style is most appropriate with the students? The next

researcher may use this curiosity as the further research, and the result may give benefit for the teacher in the future.

G. Research Paper Structure

This research paper was consisting of five chapters, the explanation for each chapter are as follow:

1. Chapter one, deals with the background, problem, objective and benefit of this research. The first chapter becoming the base of this research. Any discussion that made was based on the research problem, and every effort of this research are based on the thought that served as background in chapter one.

2. Chapter two, deals with literature review that explain mainly about the theory that used in this research. Consist of steps of TAI, learning style, conceptual understanding that analyzed based on optic concept and the materials for optic concept. Any needs of theoretical background can be accessed in chapter two.

3. Chapter three, concern with every method that used in this research. This chapter detailing on the research method and design, sample that used, hypothesis of the research, instrument and data processing unit.

4. Chapter four, concern with the data that gathered in this research, the author analyzes and interpreted it based on the needs of research question in chapter one. The results both of qualitative and quantitative data are served in form of table and figure.

5. The last is chapter five, concern with the conclusion that are taken from the research problem with the result of data obtained that have been analyzed and interpreted. This chapter also state the suggestion for the future research.