CHAPTER I

INTRODUCTION

A. Background

Learning science is not simply as logical think and memorizing the concept but also need basic inquiry and higher order thinking to discover a new thing or solve some problem. Learning science should involve an activities both minds' on and hands' on. So, student can gain the main concept and interested which is taught by teacher. Thus, learning process can be meaningful for student.

Several researchers advocate that a determination of correct learning style by using questionnaire or Learning Style Inventory is necessary, because it can assist to increase the academic performances of the student (Giggs,in Makhlouf *et al.,* 2012). Preferred style of learning and understanding of it can influence students' learning in a positive way. Flexible combination of learning and teaching style enable every student to develop effective ways of gaining positive educational outcomes (Stellwagen, 2001).

According to Peraturan Pemerintah number 20 years 2003 about national education system BAB II Pasal 3 stated that national education has a function to develop the ability and build a character and also dignified civilization in order to achieve the life of the nation, aimed at developing the potential of students to become a man of faith and fear of God Almighty, noble, healthy, knowledgeable, skilled, creative, independent, and become citizens of a democratic and responsible. It has been issued that the heterogeneity of student within classroom is one of the greatest challenges' that is faced by teacher. And the response has been a big clamoring to differentiate the instruction itself. Teacher may think that how to teach and give an instruction in the zone of proximal development for all student. While every student is

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unique, they have their own way to learn and their own capability to strengthen their ability in learning.

Refers to Peraturan Menteri Pendidikan Nasional nomor 41 tahun 2007, about standard process for elementary and secondary school that in the making of lesson plan teacher should watch the differences of every student based on gender, ability, level, sex, ethnics, learning style, levels of intelligences, motivation, aptitude and student interest. Understanding the diversity of student is important thing for improving the quality of learning.

Based on the nativistic theory exemplified by Chomsky, it is noted that the way perceptual system organizes language acquisition is innately given, therefore everybody follows a uniform pattern (Schemeck, 1988). Each individual has its own interest on processing information led to the theory of cognitive process in 1950s. While the cognitive processes is a important part of preferences of learning style (Shi, 2011). Therefore, the student's preferences learning style may be advantageous to increase the students' cognitive.

Preferences in the assimilation and processing of information and knowledge may differ from one student to others. Learning style greatly has an effect to the learning process, and, therefore the outcome (Makhlouf *et al.,* 2012) "Learning styles refer to an individuals' characteristics and preferred way of gathering, interpreting, organizing and thinking about information"(Wang, in Shi, 2011). The teacher might not notice the characteristic of each student. So, student can not perceive and gather any information well from teacher because the instructional method are not suitable for them, then it cause negatively by the decreasing number or value of student achievement and their motivation to learn science.

In addition, learning science is a process to making observations, testing ideas, generating evidence, and justifying based on evidence. Briefly, scientific process is active. Active learning involves students in learning activity. To enhance student activeness in teaching learning process, teachers

should motivate student to increase the achievement by giving the instruction that is matched with their preference style, Aural learners more active to learn by listening, visual learners more active to learn by seeing, kinesthetic learners more active to learn by doing, and read learners more active to learn by reading or writing. Learning style responsive instruction normally increased the achievement and motivation of student (Lovelace in Choi *et al.,* 2008). So, it is important to redesign the instruction based on learners' preference learning style then the outcome can be maximized.

Creativity is not just an outcome of dramatic improvisation and artistic artifacts, but also business innovation ideas and scientific breakthroughs. While Torrence (1996) argued that creativity is a multidimensional aspect involves fluency, flexibility, originality. Creativity is necessary in science, Erez advocate when art and science being taught simultaneously, creative skill can be developed that benefit both subject, student learn courage and a desire for originality.

Consistently, student has their own way and tendency. Tendencies that seem affect choice of action and thoughts. Pattern of habitual thinking and learning make ideas will be more obvious. While, the process of deliberate creativity is take less obvious ideas. In addition, leadership of teams is one of way to facilitate think in the same modes at the same time and choose a preference's learning style to the issues of the project (Barlow, 2000). Nonetheless, not many researchers have been investigating the role of learning style that may affect the creativity and concept comprehension.

Generally, science is taught by using lecturing or guided inquiry learning regardless of gender differences and preferences' learning style of student itself. KTSP is a written curriculum that regard to learning styles, in making lesson plan. In this research paper exhibit a role of learning style that may affect the creativity and cognitive achievement of middle school students. Students preferences' learning style is determine by using VARK (Visual, Aural, Read/Write, and Kinesthetic) questionnaire, then student work in team

which has similarities and choose some project (scientific poster, artistic representation, written article or drama perfprmences) to learn optic instruments concept in science classes. By providing variation of projects is expected to students can determine which one is more attractive and it can increase students' understanding and motivation to learn without limiting creativity. Student with high levels of creativity might focus their creativity in quite different ways (Kirton in Barlow, 2010). Concept of optics instrument that eing taught in middle school itself is quite complex and need some media or representation to make it easier. Through of project based on learning style it hopes that learning process can be meaning Some of the reason above brings researcher to conduct an research to identify learning style toward students' cognitive achievement and creativity on optics instrument concept.

B. Research Problem

According to the background above, the research problem is "how is identification resul of learning style towards students' cognitive achievement and creativity on optic instrument concept?" .

From that problem there are some research questions that derived from, there are:

1. How is the profile of students' learning style?
2. How is role of students' learning style towards cognitive achievement in learning optic instruments?
3. How is role of students' learning style towards creativity in learning optic instruments?

C. Research Objectives

The objectives of this research are:

1. To analyze type of students' learning style
2. To investigate the student cognitive achievement based on students' learning style in learning optic instruments.

3. To investigate the student's creativity based on learning style in learning optic instruments.

D. Research benefits

As the benefits of this research papers are:

1. Teacher

   a. Have greater insight and know the importance of students' learning style in the process of teaching and learning.

   b. Noticed the individual characteristic of student in science class

   c. Apply project choices to develop student creativity based on their learning style.

   d. For future, hoped that teacher could develop and refine a methods or approachess which emphasizes student characteristics.

2. Students

   a. Help students to know their preference learning style based on the sensory.

   b. Develop student creativity

   c. Get experience in project-team learning

   d. Motivate students to choose what they need

3. Other Researchers

   a. To find out another consideration to improving the teaching and learning process which emphasizes learning style

   b. Further analysis the impact of learning style towards improvement in cognitive achievement

   c. Further analysis of the creativity based on student learning style

E. Organization of Study

Chapter One provides the background of the study which established the importance of the independent variables and the outcome variable intent to use learning style preference information in the statement of the problem, purpose and significance of the research. The research problem, the research question, limitation, objective and benefit are also identified in Chapter One.

Chapter Two presents the review of literature related to this study's conceptual framework. The chapter introduction is followed by a discussion of the conceptual issues of learning styles such as the variation in definitions of learning style, conceptual frameworks and model descriptions, learning styles instruments, key characteristics of learning styles, definition of creativity, student creativity , product of creativity and concept. Independent and dependent are discussed as they link to the research.

Chapter Three discusses the methodology, instrument development, data collection, and data analysis used to conduct the study. Chapter Four reports the results of the data analyses related to the research question. Chapter Five provides a summary of the findings and conclusions, limitations, implications and recommendations for further research.

F. Hypothesis

H_0: The is no differences of cognitive achievement within group of learning style

H_1: The is differences of cognitive achievement within group of learning