

CHAPTER I

INTRODUCTION

1.1. Background

Chemistry is an *experimental science*, it cannot be studied only through reading, writing or listening. Chemistry learning is not only about mastering the collection of knowledge in the form fact, concept, principle but also a certain discovery process and mastery of procedure or scientific method. Therefore, chemistry learning is not right if it is done only by monotonous lecture, but it needs method which can give a chance to students to do a process of scientific work (Jahro, 2009).

A discussion which had been done in Integrated Islamic Senior High School of AL-FITYAN on June 2015 about the learning process condition in class, it is known that teachers never use other learning methods except lecture method and debriefing in which students are only silent and less active following the learning activity. Moreover, experimental activity is rarely done, whereas demonstration activity is never done in class. For chemistry material, that is found calculation, but the students always find hardships to understand the concept so they need more time to memorize the formulation.

Learning process was very theoretical and less applied the models which had been developed by experts. On the other word, the teachers still rely on conventional models and rarely evaluate effectivity from model which was used to increase students learning outcomes.

Thermochemistry is one of the chemistry materials which is still assumed difficult and confused by students because the concepts need comprehension well until it influences its application into formulas. Thermochemistry introduces students about feedback heat relation to chemistry reaction or change the physical condition. This material needs a suitable learning method for the students. Then a teacher needs to innovate the learning model to overcome students' difficulty in mastering thermochemistry to achieve their learning target.

According to a research done by Yusof (2011), using Problem Based Cooperative Learning has been proved to achieve learning effectivity and increase the result of students learning where about 97 % students get increased on its learning result and only 3 % students don't. Problem based cooperative learning is the result combination between problem based learning and cooperative learning. It is developed by taking the benefits from problem based learning and cooperative learning then they both are combined. In problem based cooperative learning, students face on problem that is related to learning material. By there is a problem that must be solved by students in learning process so as direct students will be active. From the learning activity, the teacher will find growth value and develop on self each student. (Suharta dan Luthan P.L.A, 2013).

In addition to needing a learning model that can give ease and relief to the students, the concepts of thermochemistry can be understood by doing learning activity. Learning activity that can be done in the form of *motor activities*, i.e do experiment (practical work) or demonstration. In learning activity, all knowledge must be gained by self-observation, self-experience, and self-investigation (Sardiman, 2009). By doing experiment or demonstration, students are expected to observe indications that occurs, analyze and extract the conclusion until they get the concepts not just to memorize it.

Based on research that have been done by Ma'rifatun (2014) concluded that experimental method shows that learning achievement is higher than demonstration method on application POE learning. Sunartadi's found (2014) that using *Numbered Heads Together* learning (NHT) with experimental media resulted a higher learning achievement than using *Numbered Heads Together* learning (NHT) with demonstration media on acid, base and salt. Latifah's (2014) explained that *problem solving* method plus experiment is more effective than *problem solving* method plus demonstration which concernd on students learning achievement material about salt hydrolysis. This is proved significant level of 5%. Based on the explanation, researcher desires to do research with title: **“COMPARISON BETWEEN STUDENTS LEARNING OUTCOMES TAUGHT WITH PROBLEM BASED COOPERATIVE LEARNING USING**

EXPERIMENT AND DEMONSTRATION METHODS ON THERMOCHEMISTRY”.

1.2. Problem identification

Based on background above, it was identified a number of problems, as stated begun:

1. Are model and method applied still conventional?
2. Are Students still less active in learning process because still a teacher-centered learning?
3. Has the result of chemistry learning been maximal?

1.3. Problem Statement

Based on the background, problem identification and limitation, it can be said that the problem statement : is students learning outcomes taught using experiment method higher than students learning outcomes taught using demonstration method in problem based cooperative learning?

1.4. Problem Limitation

In order to keep this research more focused and directed, this research will be limited as follow:

1. The research has been conducted at Integrated Islamic Senior High School, grade XI Science, odd semester of academic year 2015/2016.
2. The topic has been taught is Thermochemistry.
3. The Model has been used is problem based cooperative learning.
4. The Methods have been used are experiment and demonstration method.
5. Learning outcomes have been measured were cognitive and affective.

1.5. Research Objective

Based on the problem statement above, the objective of this investigation is to find out whether students learning outcomes which are taught with experiment method is higher than students learning outcomes which are taught with demonstration based on Problem Based Cooperative Learning.

1.6. Research Benefit

Results of this research are expected to be useful as follows :

1. Assisting students in the learning process so that the students' understand thermochemistry and students learning outcomes rise.
2. Giving insightful thinking for teachers about exact model and method in the learning process which can increase students learning outcomes significantly.
3. This research will give good contribution for schools to repair and increase quality of learning process, especially chemistry subject.
4. For the researcher is Getting experience and knowledge about learning model and method that can be used in learning.
5. As a source in doing the next research.

1.7. Operational definition

Some terminologies that are used in this research defined as operational as follows:

1. Learning outcomes are success level of students' understanding the subject matter at school that will be explained in score from some test results. Result obtained in the form impression which cause changeover to individual as a learning activity (Djamarah, 2006).
2. Problem based cooperative learning is a combination between cooperative learning and problem based learning that apply challenge for students to solve problem, until students ability both cognitive, affective and psychomotoric can develop (Suharta, 2013).
3. Experimental method is a learning that involve students work with things, materials, and laboratory apparatus both as an individual and group (Hamdani, 2011).
4. Demonstration method is learning method by way to demonstrate things, events, rules, steps to do an activity, both as direct and by using learning media which relevan with topic (Istarani, 2012).
5. Thermochemistry is science that discuss about changing calor of substance that serves reaction.