

## CHAPTER I

### INTRODUCTION

#### 1.1. Background of Research

Education is the sector that most important for human civilization in this world. Education is also very important for improving the quality of human resources especially in Indonesia. If the education quality of certain country is conceited, it will make life level of society will be well in their country. But in Indonesia the quality of education is still low. It can be seen from one of indicator that has been done by *United Nations Educational, Scientific and Cultural Organization (UNESCO)*, for the education quality of development country in Asia Pacific, Indonesia is place in 10 level of the 14 country, whereas quality of teacher exist in level 14 of the 14 (UNESCO, 2010).

The quality of education can be achieved with a suitable learning process in the classroom. However, there are still many facts on the ground that student management system only done by direct instruction method that can not make students enough understand and lead to passive students which can not foster the student's achievement. This is obvious with the discovery of facts in SMAN 5 Medan that the students are still low in chemistry learning outcomes. It can be seen from the results of daily exams with the KKM value of chemistry is 75, while the students that are able to achieve only 30%.

In the other side, the problem of chemistry subject in senior high school is the weakness of teachers in channeling the child's potency. Educators often impose their own desire without observing their requisites, interest and talent that exist in each student. The other problem is that the learning model that used by teacher is still monotonous, while the teachers always use direct instruction method, so the teacher dominates teaching and learning process in classroom that makes the student is less motivated to study. Direct instruction method also makes student confuse to learn a topic that is abstract or infrequently meet by student, because by using the direct instruction method, the teacher tends not representing

the abstract object in class during the learning process. Using direct instruction method, student doesn't demand to be more creative and has not critical thinking about the topic that is learned, but the student only has role as an audience that is explained by teacher without conceiving for well.

Especially for chemistry subject, the teacher must be creative because there are some characteristics of chemistry itself. It can be seen from Situmorang (2009) that told us about the characteristics of chemistry subject, they are: 1) a number of chemistry is abstract, 2) chemistry was implication from the fact, 3) chemistry are successive and develop quickly, 4) chemistry are not only about the explanation of facts, laws, term and etc, but also the numeric problem that has important part in learning chemistry, and 5) there are so many topics in chemistry that must be studied. Furthermore, the topics in chemistry is belongs to 3 characteristics, they are the decomposition of concepts, mathematical calculations, and execution of experiments. According to this characteristic of chemistry and its topics, we need a creative teacher that has proper model of teaching for chemistry's topics.

The efforts that have been taken by the government in improving the quality of education in Indonesia is improving the quality of curriculum, that publics in 2013 where it's curriculum demand to improve the learning outcomes, cognitive, and psychomotor of students. The model that suggested to be used for teaching based on curriculum 2013, are Problem Based Learning (PBL), Discovery Learning, and Project Learning. By using that three model, it is assumed that the cognitive aspect and psychomotor of student will increase.

Based on the data above, writer wants to use a way to overcome the education problem in Indonesia, by replacing the model of learning that used by teacher in classroom, from direct instruction method to discovery learning model. It is because the Discovery Learning is a learning model that encourages students to ask questions and formulate their own tentative answers, and to deduce general principles from practical examples or experiences. Bicknell-Holmes and Hoffman (2000) describe the three main attributes of discovery learning as 1) exploring and problem solving to create, integrate, and generalize knowledge, 2) student driven, interest-based activities in which the student determines the sequence and

frequency, and 3) activities to encourage integration of new knowledge into the learner's existing knowledge base. The first attribute of discovery learning is a very important one. Through exploring and problem solving, students take on an active role to create, integrate, and generalize knowledge. Instead of engaging in passively accepting information through lecture or drill and practice, students establish broader applications for skills through activities that encourage risk-taking, problem solving, and an examination of unique experiences (Bicknell-Holmes & Hoffman, 2000). In this attribute, students rather than the teacher drive the learning. Expression of this attribute of discovery learning essentially changes the roles of students and teachers and is a radical change difficult for many teachers to accept (Hooks, 1994). A second attribute of discovery learning is that it encourages students to learn at their own pace. Through discovery learning, some degree of flexibility in sequencing and frequency with learning activities can be achieved. Learning is not a static progression of lessons and activities. This attribute contributes greatly to student motivation and ownership of their learning. A third major attribute of discovery learning is that it is based on the principle of using existing knowledge as a basis to build new knowledge (Bicknell-Holmes & Hoffman, 2000). Scenarios with which the students are familiar allow the students to build on their existing knowledge by extending what they already know to invent new ideas.

There are also some researchs that has been done by using Discovery learning model. The result's research of Balim (2008), show that the learning outcomes, the perception, the memorizing in cognitive and affective of students in experimental class that used Discovery Learning get better result than the students in control class, this model also makes students more active in learning process. While Nastiti (2012) concluded in her research that Discovery Learning model increase the student's achievements in solving chemistry problem of SMA students in Purworejo as much as 81%. The research of Suprini in Neneng (2013) also concluded that the using of Discovery learning model on Colloid properties can develop some skill of students, such as the skill in interpreting observation, planning experiment, using the tools and materials and observing. Based on the

researches before, it can be seen that the Discovery learning model can make students more active in learning process.

According to the Laws of Number 20 Year 2003 about The National Education System in paragraph 3, the national education has function to develop the ability and form the character and the culture of nation that has value in educating nation's life. The national education has objective to develop the potential of students to be the faithful human to the God, have a certain character, healthy, bookish, capable, creative, autonomous, and being the democratic and responsibility citizen (Deputi Menteri Sekretaris Negara Bidang Perundangundangan, 2003). It shows that the quality of student's character education is very important to be improved. Especially in this research, by using the Discovery learning model, there are also some characters that will be developed by writer, they are the cooperation and curiosity of students. The cooperation and curiosity are belongs to 18 characters that must be developed in education life. They are some characters that very important to make students be able to share their knowledge and make their knowledge deeper than before.

Based on the background mentioned above, the writer has done the research which the title is: **“The Influence of Discovery Learning Model to Increase the Learning Achievement, Cooperation and Curiosity of Students in Teaching of Buffer Solution”**.

## **1.2. Problem Identification**

Based on the background above, some problems can be identified as below:

1. The quality of education in Indonesia still low.
2. Lack of variation in model of teaching by teacher.
3. Teachers are too dominant in the classroom learning process that causes students to be passive.
4. Students tend to dislike chemistry subjects that often have difficulty in understanding the learning concepts. It makes them less motivation in learning chemistry subject.
5. Most of teachers have not yet measure the characters of students.

### 1.3. Problem Limitation

Based on the background above, the limitation of problems can be identified as below:

1. The model that was used in this research is Discovery Learning.
2. The topic that taught in this research only on Buffer Solution topic on XI grade semester II.
3. This research was conducted in SMAN 5 Medan.
4. Student's achievement that measured only the cognitive skill from the level C<sub>1</sub>-C<sub>4</sub>.
5. There were two characters that measured; the cooperation and curiosity of student.

### 1.4. Problem Statement

To give the direction of this research, the problem statements in this research are as follows:

1. Is the student's achievement that taught by discovery learning model significant higher than taught by direct instruction method?
2. How is the student's chemistry achievement that taught by discovery learning model and direct instruction method?
3. How many percents of the cooperation character can be developed by using discovery learning model?
4. How many percents of the curiosity character can be developed by using discovery learning model?

### 1.5. Research Objective

The objectives of this research were:

1. To determine whether student's achievement that taught by discovery learning model is significant higher than taught by direct instruction method.

2. To know the student's chemistry achievement that taught by discovery learning model and direct instruction method
3. To know the percentage of the cooperation character that can be developed by using discovery learning model.
4. To know the percentage of the curiosity character that can be developed by using discovery learning model.

#### **1.6. Research Benefit**

The benefits that hoped from this research are:

1. Getting learning model that suitable and effective on teaching of chemistry subject to increase the student's achievement and student's character especially cooperation and curiosity.
2. As consideration for teachers to use discovery learning model type in the classroom teaching and learning process in order to increase student's learning achievements and student's character.
3. As a matter of information for researchers in order to improve the quality of learning in a creative and innovative chemistry.

#### **1.7. Operational Definition**

- Discovery learning is encompasses an instructional model and strategies that focus on active, hands-on learning opportunities for students (Dewey, 1997).
- Cooperation is an effort in people or a group of human to reach one or some purposes (Baron, 2000).
- Curiosity is an important motivational component that links cues reflecting novelty and challenge (internal or external) with growth opportunities (Depue, 1996).
- Buffer solution is an aqueous solution that can maintain the PH of a system within a specified range when a small amount of acid or base is added, or when the system is diluted.