

## CHAPTER I INTRODUCTION

### 1.1. Research Background

Education is a pillar of country development. The quality of education determine the quality of a nation. Sardjoko (2013) said that based on the United Nation Development Program 2011, the Human Development Index of Indonesia is in 128 rank from 187 country which is surfey with 0,67 percent index. The education quality of Indonesia is low. The index of education quality is 14,8 percent while Singapore and Malaysia is 28 and 33 percent. This is proved by a lot of unemployment man due to the defeat in competitive job. In micro size, the education quality is effected by the teacher quality and education system itself.

Education in school is depend on the success in learning process. The successof teaching and learning is determined by approach of the teacher to the student. In senior high school, chemistry is one of subject taught. Based on Situmorang (2009), the difficulties in studying chemistry related with its characteristic, where the characteristics are: (1) A number of chemistry has abstraction characteristics. (2) Chemistry was asimplificaton from in fact. (3) Characteristics of chemistry are successive and develop quickly. (4) Chemistry not only problem solving. Problem solving consists of numbers (numeric problem) that has important partin chemistry learning. But also have to describe such as chemistry facts, chemistry laws, chemistry terms and others. (5) The materials which is studied in chemistry very much. One of chemistry subject in X grade at even semester is redox reaction. The redox concept is the material with abstract characteristic, factual and need an advance comprehension. To learn this subject also need skill and logical reasoning of student (Wiwit, 2012). Teachers perceive redox as one of the most difficult topics to teach and research has shown that school students have difficulties in conceptualising redox reactions. Jong and Treagust (1995) suggested that students regard oxidation and reduction as independent reactions; they have problems with the meaning and assignment of oxidation numbers and the identification of reactants as oxidizing or reducing

agents. Soudani et al. (2000) found that students have difficulties in using a theoretical knowledge of redox to interpret everyday phenomena. All of these problems make student hard to understand in learning topic of the redox reaction.

As an usual phenomenon in school, the observation result of teaching and learning activity in SMAN 3 Medan shown same problem of student. The student achievement in chemistry subject is relatively low (lower than standard pass of exam). There is no variation in teaching and learning process. The class is always start by teacher explain the material, give example and then give homework for student. Teacher also rarely use media in teaching thus student only listen to the teacher explanation. This make student has no interaction with friends nor teacher in increasing the comprehension of topic learned and not develop the character of student.

In Law No. 20 Year 2003 about National Education System at section 3 stated that national education is used to develop ability and form character and prestige nation culture in developing national intellectual life. According to the function mentioned, the purpose of national education is to develop the potential of student become faithfull man to God The One, noble character, healthy, educated, capable, creative, independent and democratic citizen and also responsible. The content of National Education Purpose imply that education will create intelligence of intellectual, emotional, spiritual, social and kinesthetics. The National Education has noble purpose to student individual, those are developing educated personal, increasing technical competency, developing strong personality and forming strong character, and creating perfect human and prestige life (Suharta, 2012).

In supporting the national education system, curriculum need to make the system effective. Curriculum is a set of plans and arrangements regarding the purpose, content, and teaching materials and methods used to guide the organization of learning activities to achieve specific educational objectives (Law number 20 year 2003). In Farisi (2012) curriculum experts considers that the curriculum has a strategic position and influence in the overall educational process and outcomes. They also agreed to put the curriculum in a central position

in the educational process, as the design process and outcomes, and center of education. In this position, it is not an exaggeration to say that the process and educational outcomes are controlled, regulated, and assessed based on the criteria contained in curriculum. In development country, curriculum need to be developed. Based on the functions and objectives of the national education, the curriculum development must be rooted in the national culture, national life today, and the life of the nation in the future. Curriculum 2013 is developed curriculum which is centered on the needs, requirements, and interests of learners and the environment. Competency-based curriculum model is characterized by the development of competence in the form of attitudes, knowledge, thinking skills, and psychomotor skills are packaged in a variety of subjects.

One of competence development is the teamwork character. According to Suharta (2012) a teamwork action undertaken together with along with mutual understanding, mutual respect, and help each other so that it looks unity and compactness. This collaboration skill is necessary because humans are social creatures who need others to help each other, and helping each other can be done if there is always collaboration among individuals. According to Johnson (1975) teamwork is working together within the group to reach the group goal. This will promote interpersonal processes that will generally improve the quality of classroom life and increase the enjoyment and productiveness of both the teacher and students.

In improving the teamwork character and student achievement, researcher implement the cooperative learning of STAD (Student Teams Achievement Divisions) type to increase the activity and interaction of student through teaching and learning process. In Kunandar (2007) STAD type is developed by Robert Slavin at all from John Hopkins University. This is the most simple model and widely use in cooperative learning. This model is used to teach new academic information to student through verbal or non verbal. Students are assigned to four-member learning teams that are mixed in performance level, gender, and ethnicity. The teacher presents a lesson, and then students work within their teams to make sure that all team members have mastered the lesson. In the end of learning

process, there is quiz to identify the student understanding. This model will increase the learning outcome, that are teamwork and student achievement.

Felder (2004) doing analysis of 39 studies of small-group learning in science, mathematics, engineering, and technology courses and cooperative learning gives positive effect ( $d=0.51$ ) on achievement (sufficient to move student from 50<sup>th</sup> percentile to 70<sup>th</sup> percentile on a standardized test). Research by Pradiyanti (2013) prove the effectiveness of STAD. The pre test of cognitive learning result is 41 and the post test is 86. The N-gain of cognitive learning result is 0.78. This mean STAD gives positive effect in learning efectivity. Study done by Majoka (2010) prove the effectiveness of STAD also. The classroom observation indicated that the students of experimental group were engaged in learning at a higher level as compared to the counterpart students of control group. Furthermore, the experimental group outscored significantly the control group on posttest showing the obvious supremacy of cooperative learning over traditional method of teaching. Hence, ultimate result of the study indicated that STAD was more effective instructional paradigm as compared to the traditional method of teaching. Due to its provision for higher learning engagement, it proved to be an active learning strategy.

Besides the using of model, the increasing of learning outcome can be supported by using of media. According to Munadi (2008), media in outline is human especially teacher but not only it, anything that create to deliver the learning message is learning media. Specifically, the definition of media in teaching and learning process is graphic tools, photograph, or electronic to get, process, and rearrange the visual and verbal information. Media is a part of teaching and learning process to reach the educational purpose generally and learning purpose in school specifically. To provide more information from media, multimedia based on computer is used in this research. Multimedia has ability to combine all media elements, for example text, presentation, video, animation, image, graph, sound and develop the learning material become more efficient and flexible.

Based on the background described, researcher interest to do the research entitled : **”The Implementation of Cooperative Learning STAD Type With Multimedia Based on Computer To Foster Teamwork and Increase Student’s Achievement in Redox Reaction Topic”**.

### **1.2. Scope of The Study**

To focus on the problem, so the scope of this study are :

1. The subject taught in this research was chemistry on redox reaction topic
2. The teaching models were cooperative learning STAD (Student Teams Achievement Divisions) type and direct instruction
3. The media was multimedia based on computer
4. The research result to be measured were student’s teamwork character and student’s achievement
5. The research object was student X grade in SMAN 3 Medan, SMA Laksamana Martadinata and SMA Krakatau

### **1.3. Problem Identification**

According to the research background above, the problem identification can be divided into some points :

1. Redox reaction is difficult topic for student, because it is about conceptual understanding and need retention of student
2. Learning model and media used in learning process is not suitable with the redox reaction topic as abstract concept
3. Teamwork character of student is not improve yet through learning process
4. Student achievement in chemistry relatively low

### **1.4. Problem Formulation**

According to the problem identification and scope of study above, the formulations of this research are :

1. How the chemistry student's achievement that taught by cooperative learning STAD type and direct instruction?
2. Is the student's achievement taught by cooperative learning STAD type with multimedia based on computer is significant higher than student's achievement taught by direct instruction?
3. How many percent of the student's teamwork character that can be fostered by using cooperative learning STAD type?
4. How the effectiveness of cooperative learning STAD type with multimedia based on computer compare with direct instruction to increase student's achievement?

### **1.5. Research Objective**

Based on the problem identified, the objectives of this research are :

1. To know the chemistry student's achievement that taught by cooperative learning STAD type and direct instruction
2. To investigate whether the student's achievement taught by cooperative learning STAD type with multimedia based on computer is significant higher than student's achievement taught by direct instruction
3. To investigate how many percent of the student's teamwork character that can be fostered by using cooperative learning STAD type
4. To investigate the effectiveness of cooperative learning STAD type with multimedia based on computer compare with direct instruction to increase student's achievement

### **1.6. Research Benefit**

The benefit of this research are :

1. Benefit for student  
Give chance for student to have different experience in learning, thus student can optimized the character, especially teamwork character and get more understanding during learning process

2. Benefit for teacher

Give alternative teaching model and media to increase student achievement and develop student teamwork during the learning process

3. Benefit for researcher

Give experience in apply the model and media in teaching process

### 1.7. Operational Definition

Some operational definition in this research are :

1. Redox reaction is a topic given in X grade at even semester discuss about the oxidation number concept, reduction and oxidation reaction, compound nomenclature and redox reaction application in daily life
2. STAD is Student Teams achievement Divisions, a type of cooperative learning model developed by Robert Slavin et all
3. Multimedia based on computer is media that can combine all media elements, for example text, presentation, video, animation, image, graph and sound (Munadi, 2008)
4. Teamwork is actions undertaken together with along with mutual understanding, mutual respect, and help each other so that it looks unity and compactness (Suharta, 2012)
5. Student achievement is result of interaction teaching and learning. For teacher, teaching activity closed by evaluation of achievement and for student, achievement is result of learning activity (Dimyanti and Mudjiono, 2006)