CHAPTER 1

INTRODUCTION

A. Background

Science is a way of knowing by asking and answering questions about the universe (Trefil & Hazen, 2010), science is the most powerful tool to understand how the world works and the interaction between surroundings. Science also develops deeply to explore the environment that surrounds people. Science encounters social life of human being, therefore science is proposed to the entire citizen known as ‘science for all people’ (Liliasari, 2009). The issue of socio-scientific, for example genetic engineering, reproduction technology, and science as politic issue, such as food safety is spreading though media into society and always debated.

Nowadays issue, it is arising that science must become basic thinking of people to withstand in their daily life. Because of much contribution of science within people’s life, for example using chemicals as the housewives’ use; and also utilization of wavelength for television are strengthening the contribution of science in daily life.

Since science must be the basic thinking to develop people in every country, education about science must be given from early age of children. Students must be able to apply the knowledge of science in their daily life. Students should not only learn about the concept of science that has been taught by the teacher, but also strengthen it as their basic thinking. This basic thinking also provides critical thinking and develops cognitive thinking of students.

Based on Fisher (2008), critical thinking is actively considered about what students believe about one concept or material from certain viewpoint and conclusion using supportive claims in evidence and reasoning. Critical thinking is one of education purposes that are needed to be applied continually to increase the
capability of thinking critically and decision making rationally based on what people believe. Students as the beginner of scientist will definitely face the issue in their daily life, debating and also arguing about science issue to support claims using evidence and reason that are already explained. Delivering information to strengthen the truth evidence and reason needs some skills to inform the others who do not really know about the information concerning the issue deeply.

Communication skill is needed to inform the argument in order to deliver good content of reports and issue which needs ability to judge the valid and supportive evidence, and to distinguish the correlation, hypothesis, and discussion from observation scientifically. The process of scientific argumentation can be measured by two aspect, communication skill through writing or written argumentation, and communication skill through speaking or verbal argumentation (Kuhn, et.al, 2010). These processes of critical thinking are needed to be trained since young learning process of students through debates.

Debates method is communication process that states with language to defend an argument. Each side will declare argument and give claims with several steps to counter. This definition states that debates are one method to communicate between people to argue their ideas and declare argument. Using debates to enhance students’ scientific argumentation can make students directly involved in teaching learning process in discussion with ideas, arguments, and declared the ideas to strengthen their solution of a problem (Silberman, 2009).

Debates in argumentation will be very useful to their critical thinking development. Based on Greenwald, Persky, Campbell and Mazzeo in 1999, students have low skills in communication to deliver argument verbally and written compared with standard test. To enhance the better learning in argumentation, ecosystem content that includes into science subject in Indonesian curriculum arranges the competency standard for biology, “memahami saling ketergantungan dalam ekosistem” (Departemen Pendidikan Nasional, 2003). Therefore, the purpose of this research is to analyse the students’ scientific
argumentation using debates, especially using communication skills. This ability can be trained since early age then students become usual to argue and deliver their opinion.

B. Research Problem

In line with explanation above, the problem of this research is, “How is students’ scientific argumentation through debating in the concept of ecosystem?” Specifically, this research was formulated in problem question and problem limitation.

1. Problem Question

Synchronizing the research problem above, the research explored these following questions:

a. How is students’ argumentative skill when debate is applied in ecosystem concept?

b. Which criteria is the highest percentage in students’ debate?

c. How is students’ response when debate is applied in ecosystem concept?

2. Problem Limitations

To refer the research there are some research limitations, there are several limitations used to prevent problem extension:

a. Scientific argumentation type is argumentation through debate.

b. Scientific argumentation analysis in debate grading groups using argumentation domain from SEDA (2007)

c. Ecosystem concept which is described is limited to first grade students’ in water pollution concept
C. Research Objectives

This research is aimed to analyse about the students’ scientific argumentation performance during debate in classroom in ecosystem concept; limited to water pollution.

D. Significance of Research

This research is worthwhile in giving alternative learning method in biology concept and beginning to practice scientific argumentative skills at once since young for teacher instruction. Meanwhile increasing students’ understanding use different active learning can be taken as one worthwhile. Train students’ public speaking skills, as one of helpful skill that can be measured in or out from school. In further, ability of critical thinking can be develop by students if debate always practiced by them.

E. Research Paper Structure

Structured paper or systematic paper can maintain research in order to researcher, this research is arranged on the following structured:

1. CHAPTER I : INTRODUCTION

This chapter consists of sub chapter: A) Background, B) Research Problem; which includes 1) Problem Question and 2) Problem Limitations, C) Research Objectives, D) Significance of Research, and E) Research Thesis Structure; includes chapter one until last chapter overview.

2. CHAPTER II : LITERATURE REVIEW

This chapter consists of literature review from expert that has been studied related to research title including explanation about scientific argumentation, debate explanation, and ecosystem concept about pollution.
3. CHAPTER III: METHODOLOGY

This chapter covers the arrangement of research methodology and research flows. Chapter III describes about A) Research Location and Subject; includes research population and sample B) Research Design C) Research Method D) Operational Definition E) Research Procedure F) Research Instrument; includes 1) Instructional Tool and 2) Research Rubrics; inside this research rubric explained a) Debate Grading Rubrics and 2) Questionnaire. G) Instrument Development and H) Analysis.

4. CHAPTER IV: RESULT AND DISCUSSION

This chapter explains result in data analysis and discussion in research implementation. This chapter would generally describe about dominant percentage of debate domain after implementation, analysis of scientific argumentation when debate is applied in the implementation classroom, and students’ response when learning with debate.

5. CHAPTER V: CONCLUSION AND RECOMMENDATION

This chapter consists of two sub chapter, A) Conclusion, and B) Recommendation