

CHAPTER I

INTRODUCTION

A. Background

Science is important because we live in a world where nature is always changing in every second, such as the technology that never stops developing. It is in line with McFarlane (2013) that science is not a static discipline. Involving science with education, culture, scientific theory and philosophy of science have been a long tradition in order to build up scientific way of thinking (Matthews, 2012). Science is real and it focuses on the realism that occurs in daily life. Science is also the reality of progress and survival that is relative to individual and societal experiences in contemporary setting (McFarlane, 2013). Science is the knowledge that is talked and written in words. It is not the ideas that are expressed by the numbers. Therefore, learning science is learning a new dialect with the acquisition with other knowledge, theories and languages (Erickson, 2012). Science helps students develop scientific habits of mind, giving rise to the interest and the excitement that underlie decisions to participate in science especially in daily life (Hayes and Trexler, 2016). Learning science cannot be apart from human life especially for the learners, because we live in nature where everything relates to science.

Science education in 21st century must focus on developing strategies and solutions of common problems in a daily life. Learning science does not always happen in the classroom, but it can also do as an informal learning environmental science (McFarlane, 2013). Learning science can happen everywhere as long as the students learn new things from the environment as the result of scientific methods, observations and experiments. Science shall be taught as an active and true to life discipline because science and human relates each other. Science shall be based on the fact that is found as the result of scientific observations. Learning science can be useful in all aspects of human life. It is in line with McFarlane (2013) who states that the importance

of learning science are in global economy, future career as well as social and cultural relations.

Learning science cannot be apart from Nature of Science (NOS). Nature of science (NOS) has been studied as an important goal of teaching and learning as well as assessment in science education (Lederman et al., 2002). Nature of Science is non-static as well as dynamic where the new knowledge and the theory are obtained through new studies and new investigations. Nature of Science (NOS) is an epistemology of science, science as the way knowing, beliefs, assumptions and values that is inherent to scientific knowledge (Celik and Karatas, 2014). There are some aspects of Nature of Science (NOS) that is stated by Mattheews (2012) that the seven aspects of Nature of science is known as “Lederman Seven” which are empirical nature of science, scientific theory and law, creative and imaginative nature of scientific knowledge, theory laden nature of scientific knowledge, social and cultural embeddedness of scientific knowledge, myth of scientific method, as well as tentative nature of science aspects. All of these aspects cover all scientific skills, way of thinking and scientific performance in facing the real world. All of those aspects relate to some features of Nature of Science (NOS) which are cognitive, cultural, social, political, ethical, commercial, structural, and psychological.

Based on the statement of the experts above, Nature of Science (NOS) cannot be apart from science education. In learning science the seven aspects of Nature of Science shall be reviewed from the result of students' achievement, because it covers all of students' scientific knowledge. Nowadays, the seven aspects of Nature of Science (NOS) in a learning activity are mostly neglected. The teachers seem like forgetting to include and review students' Nature of Science (NOS). Especially science teacher in Sekolah Indonesia Kuala Lumpur who taught science as a whole for 7th, 8th, 9th grade students even do not know that Nature of Science (NOS) consists of seven aspects.

Involving Nature of Science (NOS) in learning has an important role to build up students' scientific knowledge. The students in Sekolah Indonesia Kuala Lumpur (SIKL) derive from various cities in Indonesia who also definitely derive from different social, cultural, educational and religious background. Different background of the students will define how they are in learning activity as well as in daily life. The students in Sekolah Indonesia Kuala Lumpur (SIKL) shall be able to adapt with new environment especially the culture. The students shall also strive to be able to solve the problem that will arise from new environment they just moved. Thus, the students in Sekolah Indonesia Kuala Lumpur have their own Nature of Science (NOS) results because of all of those different backgrounds that blend in one classroom.

Science and nature cannot be a part, because nature is science and science is all about nature. Everything in this world is learned in science. We as human, as a living organism cannot be a part with science. The interaction between living organisms and unliving organisms with nature is learned by junior high school students based on Competency Standards No.3 as well as Basic Competence No 3.2, 3.3 and 3.8 in *Kurikulum 2013* in topic Interaction of Organisms and Its Environment. In this topic, the students learn about everything relates to science. This topic is chosen because this topic represents students' condition with nature. Interaction of organisms and its environment topic relates closely with students daily life. The students do not just learn from the book and the theory, but the students also experience all that is learned in interaction of organisms and its environment topic. The students have a role as living organisms that surely adapt and interact with the environment as well as unliving organisms. As individual species, human need a place to interact between other species through differences, similarities or complementarities (Molles, 2013). In addition, human do interaction every day to keep alive both with other living organisms as well as the environment. Therefore, the research presents the current students' profile of Nature of

Science on interaction of organisms and its environment topic at Sekolah Indonesia Kuala Lumpur.

B. Research Problem

The research problem of this study is “How is the Profile of Students’ Nature of Science (NOS) on Interaction of Organisms and Its Environment topic at Sekolah Indonesia Kuala Lumpur?”

C. Research Questions

Elaborating the research problem, the research attempts to explore the following questions:

1. How is the profile of students’ Nature of Science (NOS) on interaction of organisms and its environment topic at Sekolah Indonesia Kuala Lumpur?
2. What Nature of Science (NOS) aspects that is most highly achieved by junior high school students Sekolah Indonesia Kuala Lumpur?
3. What Nature of Science (NOS) aspects that is the least achieved by junior high school students Sekolah Indonesia Kuala Lumpur?

D. Limitation of Problem

In order to make the research become more focused, the problem is limited as follow:

1. Nature of Science aspects that is stated by Duschl and Grandy (2013) as well as Matthews (2012) known as “Lederman Seven” has seven aspects of Nature of Science (NOS). This research used six aspects of Nature of Science (NOS), which are (a) the empirical nature of science, (b) the scientific theory and law, (c) the creative and imaginative nature of scientific knowledge, (d) the theory-laden nature of scientific knowledge, (e) the social and cultural embeddedness of scientific knowledge, and (f) the tentative nature of science.

2. In this research, the topic is the interaction of organisms and its environment that limited by Core Competency No.3 and Basic Competence No 3.2, 3.3 and 3.8 attached in *Kurikulum2013*. The interaction of organisms and its environment topic mostly talks about the environment consisting the biotic component, the abiotic component, the interaction includes the food chain, the food web, the ecological pyramid and the classification of organisms.

E. Research Objectives

The objectives of this research are as follow:

1. To profile the students' Nature of Science(NOS) on interaction of organisms and its environment topic at Sekolah Indonesia Kuala Lumpur.
2. To capture the condition in Sekolah Indonesia Kuala Lumpur that affects to the result of Nature of Science (NOS).

F. Research Benefits

The results of this research are expected to provide the benefits as follow:

1. Teachers

For teachers, this research will provide the profile of students' Nature of Science (NOS). Hence, teachers will know what should be done in the instruction. Additionally, the result of this research will give the additional information about how the students face science in their daily life and how important science and the aspects of Nature of Science to the development of technology and knowledge in modern era.

2. Students

This research is useful for the students to measure their awareness of science especially in the interaction of organisms and its environment topic. Through answering the constructed response test item, students can explore their understanding, creativity and skill.

3. Other researchers

For other researchers, this research can be used as a reference in order to develop another kind of research which is Nature of Science (NOS). The information and discussion appeared due to this research can be evaluated as the way to have better ideas for the future research. Hopefully, there will be another research that could give valuable influences for better educational improvement.

G. Organization Structure of Research Paper

The structure of this research paper consist of five chapters:

1. Chapter I. Introduction. This chapter contains the background of the research, research problem, research questions, limitation of problem, research objectives, research benefits, and organizational structure of research paper.
2. Chapter II. Literature Review. This chapter contains literature review about Nature of Science (NOS), constructed response test item, interaction of organisms and its environment, and relevant research.
3. Chapter III. Research Methodology. This chapter contains the method that is used to finish this research paper, which are research method and research design, population sample, operational definition, research instrument, data collection, instrument analysis, data collecting, data analysis technique, research procedure, and research scheme.
4. Chapter IV. Results and Discussion. This chapter contains the results as well as the discussion of this research paper.
5. Chapter V. Conclusion and Recommendation. This chapter contains the conclusion of research paper as well as the recommendation for future research.