

CHAPTER I

INTRODUCTION

A. Background

Science instruction conducted at school was usually only ‘chalk and talk’. Sometimes, there were experiment, but it is not constructing knowledge, because it is done after the teacher delivers the concept, or known as verification laboratory instruction (Blanchard *et al.*, 2010). This make many researchers think how the best ways to teach science are. Many researchers donate their finding for development of education, because one of sector that can keep a nation dignified is when it citizens are literate.

The process of learning has been occurring since human are born, even though formal education are usually begin in age 6. In Indonesia, students are usually learning science since elementary school, as integrated science. They starting learn science more seriously in junior high school as they enter adolescence stage, the stage when there are improvements in executive functioning, which involves higher-order cognitive activities such as reasoning, making decisions, thinking critically, and monitoring one’s cognitive progress (Kuhn & Franklin in Santrock, 2008).

In line with knowledge of child development stages, instruction has been move to students centered teaching learning activity. Teaching and learning activity of science should match with what stage the students are, so the learning objectives can meet the ideal condition or known as ‘meaningful learning’. Unfortunately, based on survey by Organization for Economic Cooperation and Development (OECD, 2012) about six level of science proficiency, there is no Indonesian student that is in level 5 above. It shows that science proficiency of Indonesian students is low.

Indonesia government through Minister of Education has already done many efforts to fix this problem. They revise curriculum into the latest one,

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Curriculum 2013. Simultaneously with the development of curriculum, research and development of science education have simultaneously occurred. Science education has been developed from behaviorist to constructivist models. One of the most known is inquiry-based learning model. This model has been implemented in first world-countries since long time ago. For instance, in Cambridge Secondary 1 Science Curriculum Framework, ‘scientific inquiry’ is always emphasized in every stage. They put so much attention to the importance of scientific inquiry. Lately, this model is also being adopted by developing countries, such as Indonesia. This is written in Permendikbud No. 65 issued by Kementrian Pendidikan dan Kebudayaan Indonesia (2013) about standard of process, that to strengthen scientific and thematic-integrated approach, implementation of discovery/inquiry learning is needed. The importance of inquiry-based learning is now already written in documented curricula in most countries, including Indonesia. The fact that inquiry-based learning is emphasized in the newest curriculum of Indonesia indicates the high demand of scientific inquiry skills for Indonesian students.

Whether or not a curriculum is effective in developing scientific inquiry skills of the students, it is not merely underpinned by the curriculum, but also about how it is implemented. One of many ways to make science teaching and learning run well is by making well-planned teaching and learning preparation, in shorter words, a good lesson plan. There are many factors should be considered in making lesson plan, including students readiness and way of thinking. If the teachers know the apperception and initial abilities of the students, the lesson planned will be straightforward to the target expected.

Related with assessment, it is absolutely expected that as the grade is increasing, their scientific inquiry skills are increased as well. However, this ideal achievement sometimes cannot be obtained due to many factors. Students which familiar with inquiry-based learning, sure are expected to obtain higher proficiency of scientific inquiry skill. In implementation of inquiry-based model, teacher must know the stage of their skills in scientific inquiry. This is to avoid the lesson which is planned too high or too low from what stage the

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students are. Students may become bored if they think that what they learn is 'piece of cake'. Or students may become 'space out' because they do not understand what they not understand because what they learn is too high.

Demand of data for education development requires teamwork of all educational participants, including researcher. Since science teaching and learning is one of very important subject to prepare students for international competitions, it is a must for all educators to make science is worth to be learned.

Those considerations show that information (data) is required to assist teacher to prepare and conduct science, and inspire the author of this paper to conduct research about scientific inquiry skills improvement of junior high school students.

B. Identification of Problem

Science is not only the matter of reading facts from book and memorizing, but also a set of process which requires many skills to be mastered. Scientific inquiry skills are very important skill for students to be aced, because they will start learn to use their mind when they retrieve information. Scientific inquiry skills are skills supposed to be possessed by junior high school students, because in this beginning of formal operational stage, students are starting to have consciousness to learn things that they think is important.

Poor result in international survey of science and mathematics literacy such as PISA and TIMSS, make the author think that it is needed to investigate the improvement of scientific inquiry skills of junior high school students, so the result can be used as evaluation for teachers and education stakeholder in improving the quality of Indonesian education system. Despite its importance, in Indonesia there is still rare research about improvement of scientific inquiry skills. This condition arouses the author to do research about scientific inquiry skills improvement of junior high school students.

C. Research Problem and Questions

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Based on the background that has been explained before, this research focused on “How does students’ scientific inquiry skills improve during Junior High School?”.

Research questions that will be satisfied in doing this research are:

1. How is the improvement of students’ scientific inquiry skills from grade 7 to 9?
2. How is/are the effect of curriculum implementation towards improvement of scientific inquiry skills during junior high school?

D. Limitation of problem

1. This research focused on measuring the improvement of students’ scientific inquiry skills during junior high school, from grade 7 to 9.
2. This research also will investigate effect of curriculum implementation towards scientific inquiry skills from grade 7 to 9.
3. Scientific inquiry skills which will be measured here are based on stages of scientific inquiry suggested by Wenning (2007: 22).

E. Research Objectives

Objectives of the research are:

1. Investigating improvement pattern of students’ scientific inquiry skills from grade 7 to 9.
2. Investigating if there is/are any effect of curriculum implementation toward scientific inquiry skills of junior high school students.

F. Significance of Research

1. Students involved in this research hopefully can be get used with question that requires inquiries skill and can train their thinking skill. Their experience in working with their mind will be richer rather than doing exercise with content-based assessment instrument.

2. This research can hopefully assist teacher to define in which stage of scientific inquiry the junior high school students are, so that teacher can prepare and conduct science teaching based on students apperception, readiness, and initial abilities both in content mastery and scientific inquiry skills.
3. School administrator may use the data as consideration for making school policy about teaching and learning program, especially in implementing curriculum to enhance scientific inquiry skills.
4. Hopefully, finding of this research can assist future researcher that having research interest about scientific inquiry skills or inquiry-based learning, and generally in science education.