

CHAPTER I

INTRODUCTION

1.1. Background

Education is a process of learning things in order to facilitate students coping with the environmental and close to everyday's life (Hamalik, 2008). It is one of the efforts to develop student's capability to deal with problem and issues surround them. It is the process of changing the student's mind-set through a series of experience and interaction with the environment. The process of learning leads to a changing behaviour that will help them to deal with difficulty in their future life. Students are developing their critical thinking while going through the education period. They develop and use logic when they face difficulty and when they make decisions and interact with people. In the long run, education also helps people to meet their basic job qualifications and makes them more likely to have better jobs.

Education is a learning process that involves several key factors. One of them is the component of the teaching itself is a teacher. The ability of a teacher is crucial in determining the quality and outcomes of the learning process. Purwanto (2006) stated that the outcomes of learning process is a behavioral change through the learning process and refer to the educational goals. One of the learning outcomes is the results obtained in the form of numbers or scores going through a period of time learning procedure (Dimiyati and Mudjiono, 2006). The result will be revealed in the form of numbers or scores achieved by the student to confirm the student's proficiency level after studying any topic.

Student's test results will be affected by several things such as teacher's methods in teaching. The most method used of teachers at SMA Negeri 1 Berastagi is lecturing, and the discussion is also rarely used. The observation at the school and the interview with the teacher has revealed that the test result in Environmental Change and Conservation Topic was low. The main reason for the

low scores were suspected to come from the use of lecturing method in delivering the topic. This particular topic is known to have issues or problems around the topic. Teachers must be in an update mode in order to have recent issues and problems about the environmental change and conservation. This topic is an on-going experiences and teachers may include this specific information into their teaching. Teachers are required to take initiative to improve their ability to help student in achieving their goals in learning things.

Student's low score is an indication of the learning difficulty. In biology, students having difficulty have been widely studied by researchers worldwide. The terminology, abstract concepts, and the language used (Latin and foreign) in Biology are some of the problem students may experience. Basically, some may find that the material of biology itself is the main reason for students having difficulty learning biology. Many concepts or topics in biology, including the structure and function of plant tissue, water transport in plants, protein synthesis, respiration and photosynthesis, gaseous exchange, energy, cells, mitosis and meiosis, organs, physiological processes, hormonal regulation, oxygen transport, genetics, Mendelian genetics, genetic engineering, and the central nervous system can be perceived as difficult to learn by secondary school students.

The lecturing method has weaknesses that both teacher and students may experience. One of them is the tendency to make teacher is the only source of information. Students will have more time to be passive as the process of information delivering or transferring will go in a one-way direction. The students' low academic achievement on the exam can be defined as low or weakness of the student's mark under the normal average in a study subject level as a result of a variety of reasons. This may lead to frequent repetition of failure, despite their abilities that qualify them to get the best marks (Rumini, 2013; Supriyono, 2013). In this school, the KKM of the students is 75 and the data revealed that more than half of the students score were under the minimum score required by the curricula.

To overcome the problem arised from the conducting lecturing methods in the classroom, teachers must try to practice models in their teaching activity. Model-based learning has a long store in educational theory (Louca & Zacharia, 2012). Despite teachers have difficulties to envision how to incorporate them into

classroom instruction (Hoskinson *et al.*, 2014), but still, they must use learning models to help students mastering the topic they are studying. The topic of environmental change and conservation contain problem and issues about the environment and what it is facing today. The problems can come from a variety of sources: newspapers, magazines, journals, books, textbooks, and television/movies. One alternative for teachers to improve the student's test results is using models to teach the topic.

The topic of environmental change and conservation is a complex real-world problem and the most suitable model for teaching this topic is Problem-Based Learning (PBL). The problem is incorporated in the topic and is used to promote student learning of concepts and principles as opposed to direct presentation of facts and concepts. Several activities of applying the model of PBL are: promoting the development of critical thinking skills, problem-solving abilities, and teaching the communication skills. It can also provide opportunities for working in groups, finding and evaluating research materials, and life-long learning (Duch et al, 2001 in <https://citl.illinois.edu/citl-101/teaching-learning>). This model will also help students by introducing the real world in which they live and on the natural and social level. They may develop the skills to evaluate, assess, and draw inferences on environmental issues and concerns. Teachers can teach the concept and strategy on improving student's understanding of environmental issues, as far as possible.

Problems that are solved through PBL are considered authentic as the problems found can be seen everyday in life (Tan, 2003). Problem-based learning is known to have increased student's motivation and students learn how to solve the problem (Argaw *et al.*, 2017). Another research added that PBL can create a conducive learning environment for students and parents, and its implementation is determined by the learning experiences in the classroom and other learning environments (Sugiharto et al., 2019); Craig & Marshall, 2019).

Several previous research have shown that PBL has helped teachers to improve student's achievement at tests (Harnitayasri, et al., 2015; Agustin et al., 2019). Students showed increasing activities in the learning process both at school and home, and the test's scores. As Budimansyah (2003) stated that

learning biology requires comprehensive learning and high-level understanding, and students need to develop the skills to explore and understand the natural environment as well as his own. The environmental change and conservation topic needs a further way of thinking to develop character and attitude. This topic needs to comprehensively understand the knowledge in order to have a thorough concept and influence action and sensitivity about the issues. Few research found the correlation between knowledge and attitudes towards the environment is not significant. Another research revealed that they are common factors that might influence the correlation between knowledge and attitudes with behavior (Liu et al., 2015). From this statement it can be inferred that procedures in PBL will help teachers to create activities of critical thinking such as to identify, analyze, and evaluate issues and hope to bring action and sensitivity about the environment.

The topic of environmental change and conservation is part of the environmental education and PBL can be primary forms or learning approaches that must be used to improve the effectiveness of environmental education (Maclean & Pavlova, 2017). Other findings supported the use of PBL in the classroom to improve students' environmental literacy and perspectives on environmental issues (Raath & Golightly, 2017; Fenny et al., 2019). The activity of discussion and argumentation on environmental and conservation issues at the learning process help to influence students's attitude positive toward environmental literacy, and socio-scientific reasoning (Kinslow et al., 2019); Chang et al., 2017). The findings at school showed that students were lacking in implementing ability to discuss and argue, and more focus on the knowledge from both teacher and textbooks. Based on a preliminary study and problem identification, this study aims to investigate the effect of PBL model of environmental change and conservation topic on test result of students at SMA Negeri 1 Berastagi. The issues used are related to the environment and nature, environmental pollution and global warming in the tenth grade of SMA.

1.2. Problem Identification

Based on the background above several problem can be identified as follows:

1. The nature of Biology lesson material is difficult.
2. The lesson material of environmental change and conservation is not interesting for students.
3. Learning media is absence during the teaching process.
4. Insufficient time allocation in the curriculum.
5. Teacher-centered method is still an on-going way of teaching the topic.
6. Lack of learning aids.
7. Low test's scores of the students on the topic of environmental change and conservation.

1.3. Problem Scoping

The scopes of the research are following:

1. The subject of study is X MIA of SMA Negeri 1 Berastagi.
2. The topic is the environmental change and conservation.
3. The research is about determining the effect of problem-based learning model on student's test result.

1.4. Research Question

The research question can be formulated as follow:

1. What is the effect of Problem-based Learning model on students' test results on the topic of Environmental Change and Conservation?

1.5. Research Objective

Based on problem statement above, the objective of this research is:

1. To explore the effect of using the problem-based learning model in the environmental change and conservation topic on the tests result of X MIA of SMA Negeri 1 Berastagi.

1.6. Research Contribution

The research is expected to benefit several parties:

1. School: as information about alternative strategy to deal with difficult topic of environmental change and conservation.
2. Teachers: as information to improve their teaching strategy and using model of PBL.
3. Researcher: as information about teaching environmental change and conservation and rising awareness about the environmental issues and problem.

1.7. Operational Definition

1. Problem Based Learning enhances students learning outcomes by promoting their abilities and skills in applying knowledge, solving problems practicing higher order thinking and self-directing and reflecting their own learning (Hung, 2013).
2. Learning outcomes is an important part of learning. Student learning outcome is a change in behavior as include cognitive, affective, and psychomotor (Sudjana, 1989).

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