

CHAPTER I

INTRODUCTION

1.1. Research Background

Students come to school with varying experience with ideas about and explanation of the natural world. The scope of these ideas is as diverse as the students' backgrounds and they are often different from those of scientists (Tekkaya, 2002). Children develop ideas and beliefs about the natural world through their everyday life experiences (Tuysuz, 2009). Citrawathi (2006) stated that students observe various phenomena or natural phenomena in the environment naturally.

The unique conceptions about natural phenomena that are held by students are often resistant to instruction and will lead to misunderstandings in understanding a new concept which he had learned (Chandrasegaran, *et al* 2007). These misunderstandings occur when students are trying to form the knowledge by way of translating the new experiences in the form of the initial conception and may arise when teaching fails to induce a conceptual change among the students (Deshmukh, 2007). As a consequence, students will experience difficulty in integrating any new information within their cognitive structures, resulting in an inappropriate understanding of the new concept (Treagust, 2006).

The difficulties experienced by the students surely can have an impact for gaining the optimal achievement in student learning outcomes. For examples of indication of the difficulties the students in understanding the concepts. Understanding the concept is very needed, especially in biology to integrate the nature and technology in our daily life. Understanding of the concept can help students to describe the concept that related and then can explain the natural events around them (Winahyu, 2007).

Vita (2015) stated that these misconception is not simple that can be easily overlooked in this biological learning. It is very important for teachers to learn over misconceptions to the students in order to make an effort to overcome misconceptions. It is useful to give a direction where, how the learning will be conducted and where the source of the misconception that the results of the

learning learners more optimized and does not interfere with processing concepts in cognitive structures conducted by the learners (Salirawati *et al*, 2012).

Suparno (2005) stated that generally, the cause or the source of the misconception can be summarized in five groups: students, teachers, textbooks, context, and teaching methods. Often the causes of it stand on its own, but sometimes related to each other, so the wrong understanding is becoming increasingly complex. This has resulted in more and it is not easy to help students overcome their misconceptions.

According to Chandrasegaran, *et al* (2007), learners are provided with opportunities to develop new understandings with the teacher acting as a facilitator of learning rather than as a transmitter of knowledge. Therefore, in this case the subjects of biology taught not just as a product of the concept, but also teach through experience. For this reason, in the study of biology is not enough if it just to teach a biological material. Students must also be invited to study biology according to this way of thinking (Mahardika, 2004). Piaget also suggested that learning is a process of construction (establishment) of knowledge by students of his experience, which takes place continuously. So students will reconstruct the knowledge to the students gain a new understanding of an object.

Adisendjaja (2007), found a lot of misconceptions in high school biology textbooks in both publications on the Department of Education and other publications biology textbooks. Some topics are experiencing misconceptions in the study, including the topic of the structure and function of cells. This is because cell materials including biological materials that are difficult sensed, allowing the occurrence of misconceptions.

Mahardika (2014), reported that 60% of students grade XI obtaining low learning outcomes on the concept of the Cell. The low learning on cell topic include of cell organelles in plants and animals and subconcepts of transport mechanism. Biology teacher in SMA Raksana Medan also reported that students have difficulty in distinguishing plasma, cell membrane, the cell wall. Lack of student learning outcomes is caused by differences in factors absorption and retention of students (Mahardika, 2014).

Based on the background above, the purpose of the study was to identify student's concept, the dominant learning resources that affected student's misconception and the factor that cause misconception on cell topic with multiple choice testing and modification of *Certainty of Response Index* (CRI) was used as the first instrument to detect student's misconception and then interview test as the second instrument to determine the consistency of each student's answer. In connection with this problem, the researchers conducted a study to identify factors that lead to misunderstanding of students in Grade XI SMA Raksana Medan on the cell topic.

1.2. Problem Identification

Based on the background above, the identification of problem formulated as follows:

1. There are misconceptions in understanding the Biology's concept especially in cell topic.
2. There are incompatibilities between students' concept and the true concepts.
3. Misconceptions occur in understanding definition, relation and application of concept.
4. Resource of misconception can come from personal experience, teacher, text books, context, and teaching method.
5. The difficulties experienced by students in changing the misconception the correct concepts that will cause adverse effects in non achievement of optimal student learning outcomes.

1.3. Research Scope

In order to make this research become more focus, this research will discuss the limited problems as follows:

1. Identification of student's concept in Grade XI SMA Raksana Medan about cell topic.
2. Identification of factors that cause the students misconceptions in Grade XI SMA Raksana Medan about cell

3. Identification of which the dominant learning resources (teacher, book, environment) that affect students' misconception in Grade XI SMA Raksana Medan about cell.

1.4. Research Question

Based on the background described, the research question can be formulated as follows:

1. How is student's concept in Grade XI SMA Raksana Medan about cell topic?
2. What factors that cause the students misconceptions in Grade XI SMA Raksana Medan about cell?
3. Which is the dominant learning resources (teacher, book, environment) that affect student misconception in Grade XI SMA Raksana Medan about cell?

1.5. Research Aim

The purpose of this study was conducted to determine:

1. To identify student's concept in Grade XI SMA Raksana Medan about cell topic.
2. To identify the factors that cause the students misconceptions in Grade XI SMA Raksana Medan about cell
3. To identify which is the dominant learning resources(teacher, book, environment) that affect student misconceptionin Grade XI SMA Raksana Medan about cell.

1.6. Research Significance

The research finding will be useful for:

1. As a consideration and input for high school biology teachers in transferring the concepts of biology to students.
2. As a source of information and reference for other researchers who want to conduct further research.
3. As an input, contribution, and scientific reference for the department, faculty, and library at the University of Medan and others in need.