

# CHAPTER I

## INTRODUCTION

### 1.1 Background of Study

Physiology is one of high school biology topic which is considered difficult to be learnt. A number of studies showed that students have problem in understanding key topics of physiology such as organ systems (e.g. Bahar, Johnstone and Hansell, 1999) and physiological process of body system (Lazarowitz and Penso, 1992). According to Michael (2007), there are some factors which made physiological topic conceived as difficult, namely, the teaching method, the characteristic of topic that would be learned and the prerequisite knowledge before learn it. Thus, a better learning strategy is needed to ensure that students can achieve learning objectives of the physiological topic.

One of physiological topic that conceived as difficult is human immune system. Human immune system deeply discussed in grade XI. Basic competence that must be achieved for human immune system topic, namely students are able to explain the mechanism of body defense against antigen and germ disease (Badan Nasional Standar Pendidikan, 2006). This competency demands students to understand the material and explain it with their own words. For understanding and explaining with their own word, they have different pace. Therefore, students must be given chance to choose their own learning mode according to their ability. Early observation was done by researcher in the middle April 2012 on SMA Negeri 1 Sidikalang. Result of interviewing with Biology teacher showed that human immune system, the last topic in even semester grade XI Science, was rarely delivered to student because teacher had explained lymphatic system when delivered circulatory topic in odd semester. In contrary, human immune system is independent topic which has separate discussion from circulatory topic, according to *Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Human immune system is not only discussed about lymphatic system, but also body defense mechanism against antigen and germ disease. Subowo (1999) in his preface said that immunology have important role for maintaining healthy life. Thus, students are highly

recommended to understand the concept of human immune system as a first step for maintaining healthy life.

There were various learning materials that used as learning source, for example: textbook, module, and etc. Chiapetta, *et. al.* (2006) noted that more than 90% of secondary school science teachers rely on textbooks to organize the learning process, deliver the concept, and assign the homework. On the other hand, textbook authors have freedom to develop their own approach for delivering content standard of curricula and so textbook represent considerable diversity. Concern has been expressed that information in textbooks is not always found to be accurate (Clifford, 2002). Hasibuan (2010) found that some textbooks in grade XI did not completely suitable to content standard of *KTSP*. Observation on SMA Negeri 1 Sidikalang showed that textbook often used with conventional lecturing. This demands all students to achieve the learning objective at same time, while every student have different pace in achieving it. Module is a specific type of learning resource. Module is essentially self contained, self-instructional packages, where students can learn according to their own pace based on individual needs and ability (Daries, 1981).

Previous study by Ali *et al.* (2010) showed that learning by using module is more effective for biology as compared to traditional teaching method. By using module, students are provided with opportunity to learn at their own pace, according to their ability level and needs.

Learning achievement is about how success the learner can master the materials of the learning object. Learning media is external factor that influence student learning achievement. A good media, in this case module, can support learning process of student and also imply a good learning achievement. For that, a developmental research was made to develop a module for human immune system topic and then evaluation was conducted to know the effect of module utilizing on student achievement.

## 1.2 Problem Identification

Based on the background, the problems were: (1) difficulty to learn physiology topic, such as immune system, (2) immune system was rarely delivered because teacher had explained a little part of this topic when delivered circulatory system topic, (3) textbook almost used as the only source of knowledge, on the contrary it did not completely suit to *Kurikulum Tingkat Satuan Pendidikan*.

## 1.3 Scope of Study

The study focused on developing instructional module for human immune system and then continued by evaluating the effect of module utilizing on student learning achievement. Developed instructional module will be used by grade XI senior high school. The module was simulated by early grade XII students who do not get the human immune system topic previously. It is assumed that those students have same understanding with late grade XI students.

## 1.4 Research Question

The problem in this research: 1) What is the suitable feature of module for implementing KTSP in immune system topic? 2) How the effect of utilizing developed instructional module on student learning achievement for human immune system topic?

## 1.5 Objective of Research and Development

Research aimed to: 1) develop instructional module on human immune system for grade XI senior high school, 2) evaluate the effect of module utilizing on student learning achievement for human immune system topic.

### **1.6 Significance of Study**

The study will give beneficial for student and teacher. For student, this instructional module as learning material will give student freedom to learn human immune system individually. For Biology teacher in senior high school, this instructional module will be helpful for solving limited available time for delivering human immune system. Besides that, teacher can use this module as other source of learning, instead of textbook.

### **1.7 Operational Definition**

To facilitate understanding of this study, different terms are herein defined:

Instructional Module. This is a self-contained or self-learning kit designed to make learning easier among students and teacher as well (Salandanan, 2001). In this study, it refers to the developing instructional module on topic immune system.

Evaluation. This refers to the process of determining the student mastering concept achievement.

Learning Achievement. This refers to criterion how success student can master the concept that have been learned. Learning achievement refers to enhancement of student mastering concept after leaning using human immune system module.