

# CHAPTER 1

## INTRODUCTION

### 1.1. Background

Curriculum 2013 is one of education system in Indonesia that has been chosen as education system for now. The curriculum is designed to improve the quality of Indonesian human resources mainly due to several reasons: (1) the challenges of the changing needs of the 21st century, (2) low competitiveness of Indonesian students in the competitive arena of international assessment, PISA and TIMMS, and (3) potential modalities golden human resources several decades into the future (Kadarwati & Suroso, 2016).

Curriculum 2013 expects that students in Indonesia in accordance with the student profile of the 21st century, there are: innovator, problem solver, risk taker, open minded, communicator, team works, reflective, knowledgeable, and opportunity creator. Related with the implementation of Curriculum 2013, the government has emphasized the use of scientific approaches in the learning process. Implementation of scientific approach to learning involving process skills such as observing, classifying, measuring, predicting, explained, and concluded (Kadarwati & Suroso, 2016).

In fact, in the real condition, the purpose of curriculum 2013 is hard to be achieved, especially in science subject. Students always consider that science subject is difficult and complicated, also science subject is considered as an abstract concept and daunting for students (Roviati, 2012). The most difficult subject in science is physics, because they have to comprehend the science content with different representation, such as experiments, formulas and calculations, graphs and conceptual explanations at the same time (Ornek, Robinson, & Haugan, 2007). Besides, they must understand about the abstract concept that we cannot be observed directly, with our eyes, and also abstract concept is too hard to imagine and to explain. Thus, they have to think hard.

Based on the result of interview some students in different school. They were stated that the most difficult in science is physics. They considers that physic is difficult subject especially to solve the problem and mastery concept or physics laws. Furthermore, they have less motivation to learn physic concepts. Many factor influence students learning. The condition affect students 'understanding and motivation in learning especially physics.

Students' motivation is important to affect students 'achievement. Motivation refers to the reasons that underlie behavior characterized by willingness and volition (Lai, 2011). Student motivation is probably the single most important element of learning. Although the learning is hard. However, when the students have a high motivation they will enjoy the learning process. Learning is inherently hard work. It is pushing the brain to its limits, so that it can only happen with high motivation. Highly motivated students will learn readily, and make any class fun to teach, while unmotivated students will learn very little and generally make teaching painful and frustrating (Wieman, 2013). According to interview some students they were agree that the motivation is important. Because it can make the aim of learning is achieved. They were stating if there is no motivation then they have no spirit. Consequently they will feel lazy to learn, they prefer to fall asleep and not pay attention to the teacher.

There are many ways to improve students' motivation, one of the ways is conducting lesson using multimedia. Stellarium is one of interactive multimedia. Because we lived in 21<sup>st</sup> century, also technology is developed well. Moreover, the development of globalization also affects teaching learning process. The development of media is commonly applied to the teaching learning process. Media is the one of the most important to support teaching learning process. Media-suffused environment today, the improvement of technologies has arousing the more and effective approaches production in teaching learning context. The derive of educational innovations have steered more innovative development for the interactive technology in varied forms, such as computer based instruction (CBI), intelligent tutoring systems (ITS),

integrated learning system (ILS), computer aided assessment and computer mediated communication (Theng & Mai, 2014).

The process of learning is a very complicated. The work can be enforced on students by giving a lot of effort. They need a lot of motivation to enjoy the learning process. According to Steyowati, on his study stated that in terms of student learning will be successful, if in itself there is a willingness to learn and desire or encouragement to learn. Because of the increased motivation to learn, students will focus on learning, and not doing activities that are not related to the learning process. In this research, an educational software stellarium will stimulate the student's interest in order to increase their motivation. As known in some area technology is growing fast, it can be observed how they use technology especially with computer game. Many adolescent and children are interested in computer game for enjoying their life (Virvou, Katsionis, & Manos, 2005). Learning solar system is quite abstract to be describing directly. There are opinions stating the wrong concept of solar system. The cassis one is about flat earth theory. This cassis is interested many people are confuse whether the earth is flat or not. Definitely students were questioning the same thing. In this case, stellarium is proposed to help the students understanding by showing the real situation of solar system in order to make the fact abstract clearer.

One of physics concepts that have abstract explanation is the motion of planet in our solar system. In solar system, there are many concepts that need to be described clearly. First, the planet cannot be identified directly by naked eyes. Second, the concept of earth rotation and earth revolution are quite abstract to be defined. Therefore, the simulation may help the students understanding on learning solar system. The previous investigation showed that the expository description of the planet motion in learning solar system sometimes make students being bored. Based on this argumentation, the research will investigate the effectiveness of *Stellarium* as a learning media to improve students' understanding and motivation in learning solar system.

## 1.2. Research Problem

According to the background that has been described previously, this research will answer the following question: "How is the effect of stellarium as an interactive multimedia on students' understanding and motivation in learning solar system?"

## 1.3. Research Questions

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

1. How does the *stellarium* as an interactive multimedia implemented to student in teaching learning process?
2. How is the effect of *stellaium* as an interactive multimedia on students' understanding in learning solar system?
3. How is the effect of *stellaium* as an interactive multimedia on students' motivation in learning solar system?

## 1.4. Research Objective

According to the proposed research problem the aim of this research are:

1. To investigate the implementation of stellarium in learning solar system
2. To investigate the effect of stellarium as an interactive multimedia on students' understanding in learning solar system.
3. To investigate the effect of stellarium as an interactive multimedia on students' motivation in learning solar system

## 1.5. Research Limitation

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

1. The conceptual understanding in this study focuses on the topic of solar system which is divided into three sub-topics, namely component of solar system, the rotation and revolution of the earth, and solar-lunar eclipse. This part has an objective to measure how effective the stellarium as an interactive multimedia in

assisting the students understanding to reach the cognitive level domain. This research involves level cognitive of remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluate (C5) based on Taxonomy Bloom (2012).

2. Students' Motivation is consist of three main aspects there are about learning solar system, the usage of technology and the implementation of stellarium.
3. The stellarium used in this research is stellarium computer based 0.15.1 version.
4. Solar system topic used in this study is solar system discussed in basic competence 3.11 and 4.11 as attached in 2013 Curriculum for Junior High School. The topics focus on component of solar system, rotation and revolution of earth, solar and lunar eclipse.

### **1.6. Research Benefit**

#### 1. Teacher

Stellarium can help teachers to make new way of learning. Teacher also can use stellarium to design learning creatively. With the design of creative learning, the learning process is expected to be innovative, interesting, more iterative, and more effective. The quality of students' learning can be improved; attitudes and learning interest of student learning can be improved. Teacher is no need to explain all the material, so the time can be used effectively.

#### 2. Students

Stellarium can increase their motivation to learn, so they cannot feel bored when they are going to learn. Students can explore their curiosity by operate the stellarium.

#### 3. For other researcher.

This research as reference for researcher who want to conduct about this research in different dependent variable or in other sample.