

CHAPTER I

INTRODUCTION

A. Background

Science and technology nowadays became two things that cannot be separated from educational life as it is stated by Muraina et al (2011) that the progressive development of the technology and science makes the world of too-much-to-know and too many sources of knowledge outside the formal classroom can easily be brought to endure within school walls by students themselves and teaching has gone beyond simply only supplying knowledge. That is why Computer Based Instruction is evolved rapidly in form of innovative and progressive learning media as being emphasized in this research. In an increasingly complex world, it is critical that all students have extensive practice for thinking like a scientist. A traditional teaching methods has rapidly modified and enhanced into a multimedia learning methods that change the way teacher teach and students learn. Moreover, the prompt and sophisticated development of technology makes a teaching learning instructions become feasible and affordable to be connected by the application of technology. Eventhough the contribution of Computer Based Instruction make students achievements vary, the utilization of those learning media has interposed the positive influence on students learning (Ozmen, 2008).

Computer Based Instruction firstly introduced as the evolvement of computer at the early 1950s that has become an important instructions applied with the help of both software and hardware. Computer Based Instruction can also be implemented in conjunction with traditional teaching methods to enhance the overall educational experience (Pappas, 2014). Computer Based Instruction is functioned as tutorials (drill and practice – response oriented interaction), problem solving (laboratory and

lecture exercise), simulation exercise (in lecture or laboratory settings), enrichment programs, remedial learning (continous and repetitive), games (application of problems of concept) and testing banks with evaluation (Andrew in Chaudhari, 2013). Computer Based Instruction is developed into various software that help instructions of various subjects in education. Adobe Flash Professional is one of them that functioned to generate a media interaction in animation format, create all graphics digital presentation, to visualize the concept of science that could not be implemented in the hands on activity method, and the application to bridge students' concrete thinking to the abstract concept of science.

The way teacher teach and students learn are limited by a teacher-centered method, text-book oriented and the limitation of multimedia. In line with this current condition, the chance to develop the multimedia to alter the teaching method is getting bigger. Goes with this idea of progressive development to create student-centered learning multimedia which can act as the bridge of interaction between computer and the users. This is in consequent with the goal of education at the present time, required students to discover all the information and concept by themselves. Though, it is not only meant to be implemented and comes to an end, but knowing how is it important for students motivation to learn and to master in certain concept are mainly needed.

Woolfolk and Nicolich (1984) stated that concepts are categories used to group similar events, ideas or objects, an abstraction, and creation of the mind to organize experience. By forming concepts, we are able to organize the vast amount of information that we encounter into meaningful units. Learning on concept of science is mainly aimed to achieve the level of concept mastery.

The Computer Based Instruction applied on the research can investigate various aspect of education, the concept mastery or the cognitive knowledge achievement of the students and also students motivation in learning are two things being emphasized. Concept mastery

is really related with cognitive aspect of learning. According to Bloom (2012), Cognitive domain is categorized into six: remember, understand, application, analysis, create and evaluation. Thus, basically concept mastery of science concept is measured by those cognitive domain.

However, the concept mastery that students possess has mainly influenced by the motivation in learning, or vice versa as it is stated by Keller (1987) ARCS Model of Motivational Design, there are four steps for promoting and sustaining motivation in the learning process: Attention, Relevance, Confidence, and Satisfaction (ARCS). Moreover, there are six major strategies described by Keller: experience, present worth, future usefulness, needs matching, modeling, and choice. Therefore, there are some strategies to overcome this condition: provide objectives and prerequisites, allow for success, grow the learner, feedback, learner control.

According to that nowadays conditions, students today are very different from those who wandered school hallways in past generations, they see the world differently, they have engaged with the technology in such a profound way that it may be changing their way of thinking. It is therefore crucial to have a sound understanding of the interrelationships between motivation, student learning, and behavior (Churchil, 2013).

Then, in this complex world, Computer Based Instruction can be applied in almost all subjects in education, and concept of Ecosystem as one of the branch in Biology is being emphasized in this research. This concept is categorized into a concept that is difficult to be imagined without such kind of learning media and roled as the representative of the real object to visualize the concept. The location of most schools are in the central of the city which there is no natural preservation place, garden, or ecological and botanical garden nearby the schools. Thus, the real objects is nearly impossible to be taught to students.

To develop any kind of learning media, it needs to be align with the curriculum as the main deeds. This research where was conducted is

use KTSP National Curriculum in combination of Cambridge IGCSE Curriculum. Cambridge IGCSE is internationally recognized and suitable for schools worldwide which brings out the best in students and develop successful learners through a skill-based approach to teaching and assessing. For learners, Cambridge IGCSE helps improve performance by developing skills in creative thinking, enquiry and problem solving. It is the perfect springboard to advanced study. Cambridge IGCSE develops learner knowledge, understanding and skills in: subject content, applying knowledge and understanding to new as well as unfamiliar situations Intellectual enquiry, Flexibility and responsiveness to change, Working and communicating in English, Influencing outcomes, and Cultural awareness.

According to KTSP National Curriculum, science instruction is supposed to be scientific inquiry to develop students thinking ability, scientific attitude, and communicate as the daily life application. So, science instruction emphasizes in facilitating direct learning experience as the development of scientific attitudes and processes. In correlation of goal of science and student-centered science flash media which is mainly all about the development of technology is include in “Mengembangkan rasa ingin tahu, sikap positif, dan kesadaran terhadap adanya hubungan yang saling mempengaruhi antara IPA, lingkungan, teknologi, dan masyarakat”, this means that the implementation of student-centered science flash media is expected to support the accomplishment of the goal of science instruction based on KTSP National Curriculum. Besides that, the requested skills of thinking behavior, scientific attitude, scientific communication, and willingness to prevent natural environment from damages are supporting the reason why this research is align with current condition of science instruction for students in secondary high level.

As stated above, the student’ skills requested by those curriculum have some connection with the research treatment in form ability in inquire the content of science throughout learning media which later on have some implication of the cognitive outcome and high response of

motivation in learning. Which means student-centered science flash media as part of Computer Based Instruction has become a tremendous potential to provide visualization of dynamic phenomena that involve change over time (for example, biological processes, physical phenomena, mechanical devices, historical development that mainly need long time to be directly observed), (Betrancourt, 2012). In summary, that is why, the student-centered science flash media is used as the alternative multimedia which is categorized as Computer Based Instruction is expected to have the positive effects of students on concept mastery and motivation in learning ecosystem, as most of other research have done before.

B. Research Problem

According to the previous explanation about the background of why this research is conducted, the research problem of this study is formulated as “How is the effect of student-centered science flash media to students’ concept mastery and motivation in learning Ecosystem?”

C. Research Questions

To elaborate the research problem, the research attempts to explore the following questions:

1. How is the effect of science flash media in improving students’ concept mastery in learning ecosystem?
2. How is the effect of science flash media in improving students’ motivation in learning ecosystem?

D. Limitation of Problem

The problems stated before are limited to the following aspects:

1. Student-centered science flash media as part of Computer Based Instruction that is used in this research is two dimensions animation

which is developed by using Adobe Flash Professional Professional. Adobe Flash Professional is used to generate a media interaction in animation format, create all graphics digital presentation. The step of using Adobe Flash Professional is firstly analyzing the whole concept of energy as integrated science, creating a flowchart based on the concept, creating a storyboard based on the concept, applying the storyboard in form of student-centered flash animated media as the research instrument, being examined by expert, doing revision, then apparently can be used for the research application towards secondary high school students (Alsultan, et al., 2006).

2. Motivation in learning is measured in this research involves some component which are ARCS (Attention, Relevance, Confidence, and Satisfaction) based on Keller (1987)
3. Conceptual mastery that is measured in this research involves level cognitive of remembering (C1), understanding (C2), applying (C3), analyzing (C4) and evaluating (C5) based on Bloom (2012)
4. The implementation of student-centered science flash media is in a concept of ecosystem as integrated science taken from Kurikulum Standar Satuan Pendidikan (KTSP) combined with IGCSE Cambridge Curriculum, grade VII, Semester II.

E. Research Objectives

Based on research problem and question that stated above, this research aims to investigate some aspects as follow.

1. To identify the effectiveness of science flash media in improving students' concept mastery in learning ecosystem
2. To identify the effectiveness of science flash media in improving students' motivation in learning ecosystem

F. Significant of Research

This research is expected to provide benefits for students, teacher, government and other researcher, as follow:

1. For students, to enhance students' concept mastery and motivation in learning science thorough an interesting and effective student-centered science flash media. With the visualization of energy and the flash content that enables students to discover the concept by themselves can give benefit for students to understand more about the topic, get motivated to learn more, get desire to develop their knowledge about the topic though.
2. For teacher, it may help for applying Computer Based Instruction easily in an interesting way. It also can prove that the use of technology is not that hard and spend too much time, but also very beneficial for the teaching learning process of science topic. The student-centered science flash media also enables teacher to only facilitate students to be independently learn and discover knowledge by themselves by actively earn from the student-centered science flash media itself.
3. For government, currently there are so much schools which lack of knowledge of technology and also lack or providing of the software and hardware that can support Computer Based Instruction, so it must be better if government provide a proper media of technology to support Computer Based Instruction in teaching learning process of science topic.
4. For other researcher, it basically benefits as the improving of knowledge, scientific inquiries skill, and perhaps can be used to help other researcher to develop similar research problem on the other topic of science and would love to finding other result of students' performance, students' attitude, students' creativity or even students' critical thinking.