

CHAPTER I INTRODUCTION

A. Background

The 21st Century era urges people to survive with digital society. The capabilities which fit an individual for living, learning and working in a digital society is required to face the development of the era (JISC, 2014). That capability is known as digital literacy. Digital literacy also works as a catalyst because it enables the acquisition of other important life skills (Moeller et al., 2011) including creativity. However, the blast in personal digital technologies occurs throughout the world offers rising up opportunities to create digital media (Hoban and Nielson, 2011). Along with digital media creation, there must be involvement of creativity. Through creativity, the creative potential of appropriate technology is selected and harnessed (Nottingham Trent University, 2017).

The fact arises as need-to-be-improved ranks of Indonesia according to two variables about overall Global Creativity Index (GCI) that brings technology, talent, and tolerance together into one single index and Global creative class. Indonesia has rank of 115 for GCI and 86 for creative class among 139 nations in the world (Florida, Mellander, King, 2015), by which not higher rank than Thailand, Singapore, Vietnam, Philippines, Malaysia, and Laos. It is such a criticism for nation especially for education. As stated by Suryadi (2016), lack of creativity is alleged as a reflection of lower level of thinking which also a *symptom* of low quality education in Indonesia. The importance of creativity in relation to improving the quality of education is very logical, as Bertha L statement (in Suryadi, 2010) that the ability to think creatively considered a vital resource for a nation.

The learning activities are expected to be devoted to developing the quality of the students' creativity to be in the process of cognitive development and intelligence obtains optimal chances. The development of information and communication technology (ICT) has contributed to the education, especially in the learning

Hanifah Putri Darmawanti, 2017

THE INFLUENCE OF SLOWMATION (STUDENT-CREATED SLOW MOTION ANIMATION) ON STUDENTS' CREATIVITY AND UNDERSTANDING OF HEAT TRANSFER

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process (Surya, 2006) In line with the development of ICT, there has been a change of view on learning which expects learning as: activity based on a model of strength, skills, interests, and culture of students, the activity is assessed by fulfillment of the task, acquisition results and solving real problems either individually or in groups (Surya, 2006) which lead to 21st century competencies including the creativity. Problem arises as the consequences of an increase in the capacity of students to create digital media, especially when using a mobile phone. Yet, students are increasingly taking still images and videos mainly for the purpose of uploading to social media sites such as Facebook, Youtube, and Instagram to entertain (Hoban and Nielsen, 2010) rather than to promote their creativity in learning especially science.

Teacher could thus utilize students' disposition to create digital media about science content through their understanding and creativity. Aside from creating, there also are increasing opportunities to use the technology and construct various media to promote students' digital literacies to be able to compete internationally (Medan, 2014). Slowmation is offered as the solution which meeting the criteria. It is a new form of student-generated representation which involves students thinking about the content in multiple ways and incorporates many connected learning processes (Hoban and Nielsen, 2010). The pre-service teacher as object of Hoban's study gave positive responses, they embraced the creation of Slowmation.

The topic of Heat transfer is taken to support the research in order to measure students' understanding of the topic and students' creativity, because not all topics are appropriate to be applied for creating Slowmation. In making animation, the topic that can be chosen should triggering good visualization and containing indirect content. Heat transfer subtopics such as radiation, convection, conduction, and the application of heat transfer in everyday life support the needs of visualization for animation. In accordance to which the processes of heat transfer as one of the content example can be illustrated into some animation visualization.

Considering all reasons have been mentioned above, the researcher aimed to see the influence of *Slowmation*: Student-created slow motion animation on students' creativity and understanding in learning Heat transfer. Therefore, this research will analyze two variables which are students' creativity and students' understanding.

B. Research Problem

The research problem of this study is about “How is Influence of *Slowmation*: Student-created Slow Motion Animation on Students' Creativity and Understanding of Heat Transfer?”

C. Research Question

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

1. How is the influence of student-created slow motion animation (*Slowmation*) on students' creativity in Learning Heat Transfer?
2. How is the influence of student-created slow motion animation (*Slowmation*) on students' understanding of Heat Transfer?

D. Research Objectives

These research objectives specifically are determined as follow:

1. To investigate the influence of student-created slow motion animation (*Slowmation*) on students' creativity in Learning Heat Transfer.
2. To investigate the influence of student-created slow motion animation (*Slowmation*) on students' understanding of Heat Transfer.

E. Limitation of Problem

Student achievement is the status of subject-matter knowledge, understanding, and skills at one point in time (National Board for Professional Teaching Standards, 2012). The research limits the knowledge understanding and skill by

understanding and creativity respectively. In order to focus the research, some limitations to the variable of research are arranged.

1. The research is based by creativity components of Amabile's in Adams (2005), which consist of knowledge, creative thinking, and motivation component. The creativity is emphasized by discussing the influence of learning implementation through analyzing three creativity components of knowledge, creative thinking, and motivation to the creativity during the processes of *Slowmation* and creativity domains that were aligned with Common Core State Standards by Buck of Education (2013) to the creativity of *Slowmation* product.
2. Understanding for the research is limited by doing the statistical measurement on the influence from objective test that consist of C1 to C5 cognitive domains based on bloom's taxonomy.
3. The research limits Heat Transfer topic based on Cambridge O Level Curriculum to five subtopics, i.e. Transfer of Thermal Energy, Conduction, Convection, Radiation, and Application of Heat Transfer.

F. Research Benefits

The results of this study are expected to provide the following benefits:

1. For teachers, it is an opportunity to spread *Slowmation* to be used as instructional resource or teaching media in order to provide creative field in learning science content. Teachers can also engage students to be fully involved in science teaching learning process through constructing *Slowmation*.
2. For students, *Slowmation* helps them to encourage their digital literacy which is associated with science knowledge and creativity. Constructing *Slowmation* as new way of representing science content gives students challenge to express their knowledge in Science creatively.
3. For other researchers, the study result is expected to extend the research area of *Slowmation* e.g. measuring different dependent variable, using *Slowmation* as new perspective of learning.

G. Research Paper Structure

Research paper consists of five chapters, as found in Chapter I. Introduction. It contains the background of the research, research problem and its limitation of problems, research objectives, research benefits, and the structure of whole research paper. The paper is followed by Chapter II. Literature Review. This section of the research paper provides a clear context for the topics or issues raised in the study. It contains theory about *Slowmation* as pedagogical strategy, students' creativity, students' understanding, Heat Transfer topic, and relevant research. Chapter III. Research Methodology. This section is a procedural part, namely the part that directs the reader to find out how the researchers design the flow of research started from applied research method and design, population sample, operation definition, the instrument used, the stage of data collection performed, until the steps of data analysis is executed and research procedures are conducted.

The Result and Discussion is broken down in Chapter IV. This chapter presents two main points, namely (1) research findings based on the results and data analysis in accordance with the sequence of research problems, and (2) discussion of research findings to answer research questions that have been formulated previously. This research paper compiles both results and discussion thematically. As the final chapter, Chapter V includes Conclusion and Recommendation. This chapter contains conclusion of research paper and the recommendation for future research.