

# CHAPTER I

## INTRODUCTION

### A. Background

When teaching topics related with anatomy and physiology especially in humans, one of the biggest obstacles most often found by teachers is how to make the topic easier and more understandable with the lack of actual samples to observe. Because anatomy deals with the insides of human body and the only way to observe it is cadaver dissection, it is often regarded as a boring and intricate (Park, Kim, and Chung, 2011).

Human digestive system is a part of the extensive concepts in anatomy and physiology of the human body. Within the scope of lesson for junior high school students, as explained in the national curriculum, it is obvious that advanced processes such as cadaver dissection cannot be performed. Junior high school students are not required, by curriculum, to perform any experiment related with human digestive system. In relation with Basic Competence 3.9 and 4.9 in Indonesian 2013 curriculum, the only activity students are required to do in the curriculum is mind mapping the topic (*Tim Pengembangan Kurikulum Kemdikbud*, 2013).

Since the direct observation of human bodily system is almost impossible for junior high school students, there is a need for other media to be developed in order to help students develop understanding on the topic. Nowadays, with the rapid development of technology, digitalized media has been a crucial part of society. From companies to bank to stores, one by one, they begin to leave traditional printed media and move on to the more modern digitalized media in order to reach to a bigger audience at a shorter time. School, as one of the most abundant social setting in a city or country, does not fall behind in this. Many schools nowadays have employed more and more digitalized media in their teaching and learning process. One of the digital media possible for use in the classroom is a digital comic.

Digital comics have had plenty of different descriptions over time. Park, Kim, and Chung (2011) described comics as powerful visual messages that convey immediate visceral meaning in ways that conventional texts often cannot. Some people related comics and cartoons as the same media, however, while cartoons and comics both use images associated with text, comics is a medium in its own right, defined roughly as 'sequential art' (Tatalovic, 2009).

Traditionally, comics exist in printed media. When the access to computers begins to get easier, digital comics and interactive comics start to get more popular. With portable gadgets, storing large numbers of comics doesn't require large spaces such as gigantic bookshelves or a reading room anymore. Comics now can be downloaded digitally from websites with lower prices compared with printed comics (Azman, Zaibon, and Shiratuddin, 2014).

The genre of comics has undergone rapid development since the rise of its popularity. However, even with the rapid development of digital comic industry and the new trend of genres, there's only a little amount of comics, especially in digital form, which provide actual educational materials. Textbook is still the only staple of science education everywhere ever since science was recognized as an established discipline in the early 20<sup>th</sup> century. And since the nature of textbooks does not exactly attract the students for casual readings, most students aren't really fond of reading educational materials (Weitkamp & Burnet, 2010).

On the other side of the spectrum, comics are already popular among younger audiences as a light reading material. Owing to the popularity and simplicity, comics have a high potential to be used in science education and communication (Tatalovic, 2009). Even though sometimes they are condemned for their outlandish use of fantasy (Locke, 2005), others have argued that comics and comic strips can be used effectively to provoke thinking about scientific and health topics (Weitkamp and Burnet, 2010). Various researches had been conducted in order to measure the role of visual aids, including comics, in explaining

concepts of science as well as improving general public's attitude towards science. In 2011, Park, Kim, and Chung conducted a descriptive research which revealed that science comic strips were able to increase medical students' positive attitude towards anatomy studies. In a different research by Toh (2012), it was revealed that using comics in the classroom helped the students develop a deeper understanding towards mathematics concepts compared with the traditional teaching media.

To achieve such impact, comics especially science comics need to be effectively designed. Most visual learning aids nowadays are still presented in such a format that requires the users to invest substantial mental effort to process them (Plass, Homer, and Hayward, 2009). To create an interesting and effective comic for younger audiences, it is important to keep things light. In Weitkamp and Burnet's research in 2010, the use of a comic character which is close to non-scientific comic characters (for example having magical abilities, young, a little naughty) is proved to attract young students' attention and keep them engaged with the comics.

Most of the previous researches about the impact of comics and other visual aid on students' learning were performed on university students and elementary school students. Researches by Park, Kim, and Chung (2013) and Lin and Atkinson (2010) proved with their researches that visual aid gave positive impact in increasing academic achievement in university students, and the research by Weitkamp and Burnet (2010) proved that using science comics gave positive impact in elementary school students' science understanding, communication, and attitude towards science studies. For junior high school students, however, there hadn't been many researches that show the effects of using comics as a learning aid.

To sum it up, due to the difficulty of performing hands-on observation in learning human digestive system, a media is needed to aid learning in the classroom. As a relatively simple media which is not difficult to create, to obtain, and to use, a digital science comic is a good

alternative for use as a learning aid in human digestive system topic. Aside from aiding the process of learning, a science comic is also expected to trigger students' interest in science, which in turn will lead them to communicate science both to fellow science learners as well as to the general public.

In an attempt to answer the demand, this research follows the development of digital science comic and experts' feedback on the finished product. The comic is then used as an aid for human digestive system lesson in junior high school level, and the results of the lesson are recorded to give a better insight on the digital science comic's impact on students' understanding of the topic.

## **B. Research Problem**

The research problem of this study is “How Does Digital Science Comic influence Students' Understanding in Learning Digestive System?”

## **C. Research Question**

Elaborating the research problem, this research attempts to address the following problems:

1. How does digital science comic as a learning aid improve the students' understanding on the topic, as compared with a conventional learning media?
2. How does digital science comic influence the improvement of students' understanding in cognitive level, as compared with a conventional learning media?

## **D. Limitation of Problem**

In order to narrow down the focus of the research, the problem is limited as follows:

1. Comics used in this research follow its description as “chronological images that provide narrative to their audience” (Azman, Zaibon, and Shiratuddin, 2013). Science comics are “comics that have as one of

their main aims to communicate science or to educate the reader about some non-fictional, scientific concept or theme” (Tatalovic, 2009).

2. Students’ understanding of the topic in this research is measured from C1 level (Remember) up to the C6 level (Evaluate) according to Bloom’s Taxonomy. The knowledge dimension mainly applied in this research is conceptual knowledge (Krathwohl, 2002)
3. The topic which will be given to the students is **Human Digestive System**, in line with Basic Competence 3.6 of Indonesian 2013 Curriculum for 8<sup>th</sup> grade students. The research will focus only on the anatomy of the digestive system, hence only the following concepts will be given to students in form of science comics for this research;
  - a. The Digestive Tract
  - b. Accessory Organs
4. The experiment group in this research uses digital science comic as a learning aid while the control group uses a conventional word-only presentation

#### **E. Research Objective**

1. To investigate whether the use of digital science comics have an influence towards the improvement of students’ understanding on human digestive system topic
2. To investigate the difference of knowledge improvements between students who used digital science comic as a learning aid and students who didn’t use digital science comic, in cognitive level

#### **F. Research Benefit**

1. For teachers, this research should be helpful in measuring the impacts of visual media usage towards students’ achievement and skills, as well as students’ response towards the media. Teachers can use this research as a base to create an effective and interesting learning process.

2. For students, this research should be a helpful the way to understand other uses of comics aside from entertainment, as well as increasing their interest towards other learning media.
3. For other researchers, this research might be used as a base for another research that investigates the effects of digital science comics towards various types of students in multiple topics.
4. For general public, this research should be helpful in explaining how comics impacts education, therefore shifting their views from negative impacts of comics to a more positive view.

## **G. Organization Structure of Research Paper**

1. Chapter I: Introduction  
This chapter gives an overview of the research background, including the research question and the problems addressed in this research, as well as the limitation of problem and the significance of the research.
2. Chapter II: Literature Review  
This chapter elaborates into theories, past researches, and actual problems documented in news and articles which constitutes the base of this research.
3. Chapter III: Research Methodology  
This chapter describes the research design, methods of data collection, and research procedures, as well as the instruments used in the research.
4. Chapter IV: Findings and Discussion  
This chapter discusses the end results of collected data and their implications towards the research problem.
5. Chapter V: Conclusion and Recommendations  
This chapter concludes the research in line with the original hypothesis and provides recommendations for future researches according to the results obtained.