

CHAPTER I

INTRODUCTION

1.1 Background

As of now, Indonesia struggles to provide inclusive, high-quality education. Indonesia has much lower quality of education than those of other Southeast Asian nations. Asian intelligence report (Political and Economic Risk Consultant [PERC], 2011) highlighted that the quality of education in Indonesia ranked 12 over 12 countries in Asia. Additionally, from 120 countries included in the 2012 UNESCO Education for All Global Monitoring Report, which measures education quality, Indonesia is ranked 64th, and UNESCO's 2011 Education Development Index (EDI) ranked Indonesia 69th out of 127 countries. The reason of low quality of education in Indonesia are: low effectivity, low efficiency, and low creativity skill of the teacher that affected to the quality of the curriculum in Indonesia (Sukasni & Efendy, 2017).

Low effective education factor is less variety of teaching media used. Many school teachers in Indonesia deliver their material in such a way, and yet still make students bored, not enjoy the learning process (Sukmahidayanti, 2015). Many of the teachers only use the media provided in schools and use it only to show the materials without transferring the knowledge to the students in attractive ways. This is resulted meaningless learning and very affected to the effectiveness of learning which contributes the most to the reason for low-quality education in Indonesia.

Media means for transmitting or delivering messages and in teaching-learning perspective delivering content to the learners, to achieve effective learning (Akhtar, 2008). The first-time term media used which is more than two centuries ago was to describe newspapers. The definition of media focuses on the use of technologies plus concepts and contexts (Dewdney, Andrew, Ride, & Peter, 2006). Nowadays, the media has many different connotations. For instance, there are mass media, print media, visual media, and social media. While media can take on many different forms, the purpose of all media is generally the same, media is a channel of communication (Macdonald, 2004).

The media, which offers teachers powerful means to make their teaching effective in achieving specific classroom objectives, helps students to gain more knowledge and ensures longer retention of knowledge. It is primarily because it offers an engaging learning atmosphere that makes learning interactions more enjoyable and meaningful, easily motivates learners as it increases multi-sensory engagement and thereby makes learning more immediate and efficient (Akhtar, 2008). It provides a more scientific basis for classroom instruction and enables teachers to transfer knowledge in an organized and more effective way. It enhances the comprehension skills and the quality of communication can be greatly improved by using media, it helps to stimulate the creativity, the thinking process and the analytical capacity of the students, and it also provides as an excellent resource for evaluating the learning outcome and evaluating the completeness of such learning. To conclude, meaningful learning could be reached according to the media used then the variety of teaching media is very important so the learning activity wouldn't be monotonous. In response to this problem, it is necessary to attempt improvement and innovation in the learning process. By choosing the appropriate media will make the learning process effective. Darling-Hammond, Flook, Cook-Harvey, Barron, & Osher (2020) state effective learning is a learning process that focuses not just on learning outcomes, but also on how a successful learning process is capable of delivering a clear understanding, awareness, perseverance, motivation and value that can improve the behaviors of students and be applicable to their lives.

As explained above, the use of teaching media is very important to achieve meaningful learning and improve the quality of education in Indonesia. The use of teaching media could be applied in learning science. Furqani, Feranie, & Winarno (2018) state the quality of science learning is strongly influenced by the quality of teachers, especially the competence in the utilization of instructional media. So, teaching media will be more effectively used in science learning. Another strong reason to use teaching media in learning science is students' dislike toward science lessons which also becomes an important note for teachers to reflect on the learning process that has been done. It could be a learning activity conducted by monotonous teachers and the process of learning which only focuses on the transfer of knowledge. Ghofur (2018) express that student only study science as a product,

memorize theoretical and legal concepts to study science only at the low level of the cognitive domain. When the process of learning science is just a process of moving material from book to student of course the activity feels boring. The interactions that occur during the learning process are influenced by the environment, several learning resources, and facilities. Teachers or educators are one of the key factors in the success of the learning process (Brooke, 2015). However, other elements must be supported. Therefore, in addition to the use of appropriate learning methods, teachers also need to utilize learning media and other learning resources that can make learning science become more meaningful. Learning Physics is one of the many lessons requiring the media to convey or explain the material. One of the roles of educational media is to provide students with experiences that can't be directly acquired but can be well presented in the teaching media. The main problem of teaching and learning of science especially Physics is generally unattractive (Henke & Höttecke, 2015). To handle this problem, interactive media makes students feel happy and motivated is needed to enhance students' science motivation. Those are many reasons why using teaching media is very important in learning science, specifically physics.

In science learning activity, science achievement is directly related to the quality of lessons they receive. To support students in their learning, science teachers need to be aware of memorization methods that aid students in reproducing links between relevant core principles and situational knowledge in an effective manner (De Jong & Ferguson-Hessler, 1996). The ability of students to retain such so-called declarative knowledge not only facilitates the understanding of new and related learning materials. It may help to enhance students' ability to analyze the nature of science issues (Pol, Harskamp, Suhre, & Goedhart, 2008). Rodrigo (2017) proposed that memory traces are by-products of the perceptual and cognitive operations performed on stimuli. In addition, memory retention is one of the most important in learning process, without retention there can't be a successful transfer of knowledge from one subject area to another (Elizabeth, 2008).

There are many ways classifying ability to retain, based on the duration it's divided into short term and long-term memory (Cowan, 2008). Short term memory refers to the recent memory and only held for minutes to days which a very short

period of time. While long term memory refers to storage where all information learned is kept months, years to decade also known as distant memories. In learning science, the use of long-term memory is very important, it's not only remembering but also learning through understanding the content of the learning which may lead to higher retention of information and recollection ability. Nevertheless, memory can be considered as the foundation towards higher-level learning, and therefore deserves particular attention (Serdyukov, 2017). In conclusion, students' retention has an essential role in learning science, to improve students' cognitive mastery and not only remember the concept but also it will be kept in students' long-term memory. Identify from those conditions, it is very important to use appropriate teaching media as important as improving students' retention in learning science specifically physic.

The other factor of the low quality of education in Indonesia is low creativity skills both teacher and student. Related with 4.0 century skills which important to develop nowadays, creativity is one of the skills that need to be improved. Nearby creativity is the key to thinking about change, challenging thought, and developing new skills and innovation, and the need for creativity is often reflected in numerous and varied ways in nearly every area of human life. Mishra (2017) states that creativity signifies and brings along novel, original and valuable outcomes for the individual or society and it has been a tradition that any ability that needs to be applied to society must be applied to the school. In this sense, the school has an obligation to produce students who show creativity now and, more importantly, later on when they enter the adult world.

Conventionally, creativity is thought to be the domain of music, art, literature, and dance, all the aspect called artistic or creative subjects. But nowadays, creativity permeates all subjects in the school (McLeod, 2011). Thus, teachers need to teach not only language but also creative language, not only mathematics but also creative mathematic, not only science but also scientific creativity. Not just the teachers who needed to be creative, but also the student who needed to be creative, encouraging student creativity is certainly part of teaching. This naturally leads to the issue of how student creativity can be enhanced and how teachers can be taught in such a way that student creativity can develop in

innovative ways. Brainstorming suspends or defers objective thinking, creates a state of relaxation. A comprehensive corpus of methods has been organized for the purpose of neurolinguistic programming (PNL). With a view to accessing part of the massive capacity of the brain, the corpus of artistic learning is becoming the dominant pedagogy of this millennium. So, both the student and the teacher need to be creative.

Improvement is needed due to the low quality of education in Indonesia. As education is the most important aspect that affected our future, education is the foundation of human life, and education serves as a way of steering the direction of our world. Education is an attempt to build an environment of learning and learning so that learners can continuously improve their capacity to have the religious spiritual strength, self-control, personality, intellect, noble character, as well as the skills required for themselves and society.

According to those problems, there are some research supports that science-content music could be a solution to achieve meaningful learning through the new variety of teaching media which improve both students' retention and creativity. Besides, students in every middle school today seem to carry their favorite tunes to school on MP3 players everywhere, recognizing the impact of music in young people's lives, some educators have used music to encourage greater students' participation in education. Start with the finding of some study that found that a majority of the students (88%) rated that songs were enjoyable in the classroom. It reduced their stress (83%) and boredom levels and they understood and retained key information better (Isabel, 2014). In addition, using music as an additional mode of entry may also aid students' memory. Also reverse to the result of Tesoriero & Rickard (2012) research which shows that memories are stronger when they are determined in an emotional state suggests that the emotional charge of music could enhance students' ability to remember academic content. Music is a part of the daily life for most young people, it is suitable used to engage and help students learn in the secondary science classroom. Organizational mnemonic devices in the sense of structuring information according to meter and rhyme, limiting the possible lyrics that would fit and thus making recall easier (Crowther, McFadden, Fleming, & Davis, 2016). Therefore, the benefits of music are varied

from cognitive aspects (i.e., improving classroom atmosphere, facilitating learning and remembering of facts/enhancement of recall, improving students' motivation and inquiry, and exploring content in depth) to affective aspects (i.e., reduction of stress, increased enjoyment, and enhancing student-teacher relationships) (Jensen, 2000).

Knowledge and emotion could be transferred through songs that have the power to attract students in ways other teaching methods can't, in addition, song lyrics can be used to convey information, music can create memories, and melodies can activate the recall of thoughts and ideas. Lyrics which rich with information and embedded in music are more likely to be remembered. Songs, specific melodies, rhythms, and tones all have the potential to engage in content learning in this way (Jensen, 2000). Implementation of science-content music into science learning activity is very recommended including the use of songs at any stage in the learning process, either as the topic of a lesson or to combine it by improving and enriching learning.

Governor, Hall, & Jackson (2013) defined science-content music as a genre of songs, either existing tunes are rewritten with new lyrics or original musical compositions, designed to teach and explain science-related concepts through verse, with a well-defined melody and/or rhythm. These lyrics illustrate that science-based music can be rich in content and concepts. The lyrics presented here are provided to illustrate the science concepts that can be included in songs, rather than to suggest how they might be used for learning.

As a result, this science-content music can be used as an innovative teaching media which can improve students' retention and creativity to solve the problem of the low quality of education in Indonesia. A variety of studies have been performed that demonstrate the positive effect of music on student learning and growth in science education when music has been appropriately used. Smolinski (2010) conducted research to see how music impacted student learning and assessed the impact of a content-rich song on students' knowledge. This research indicated that many students found music helpful in learning about some of science topics. Governor (2011) carried out a study to see if there were positive attitudes toward the use of music during science instruction related to attention, engagement, and

deeper learning experiences. In addition, McCammon (2008) and Pyeatt (2015) found that there was not a statistically significant impact on overall student achievement; however, there was a statistically significant impact on the engagement of the students. These research studies show that significant differences were found in student engagement and motivation, positive attitudes, and attention and deeper learning experiences.

The use of this science content-music is perhaps affected by students' learning styles seen from the output of the implementation of this teaching media was a music video, which very related to auditory and visual learners. Immanuel, 2011 stated that teachers are expected to develop strategies that reach every student because not all students learn the same way and teachers must be willing to adjust their teaching to meet the demands of students in their classrooms. Based on those statements, the result of students' learning styles is observed before conducted this research, as a preliminary study. The results are 19/50 students are kinesthetic learners, 17/50 students are visual learners, 14/50 students are auditory learners. The use of this preliminary study is as a foundation whether students' learning styles are affected in the use of this science-content music or not.

Solar System is the topic selected to apply this content music, besides it is one of the topics learned in physic, learning about the Solar System involves so much more than simply memorizing the names of the planets in order (Robinette, 2002). Correlated with the findings of some study, which is different teaching strategies which is very suitable to use science-content music as media to deliver the concept is very important to be considered by the teacher, a significant amount of additional work remains to be done before any reasonable decisions can be reached as to what should and should not be included in any astronomy unit and how that unit can be delivered in order to help guide even more aspects of performance (Sharp & Kuerbis, 2006). Therefore, solar system will be very suitable to implement this science content music.

1.2 Research Problem

Based on what written on the background above, the problem found on this research is “How to improve students' retention and measure students' creativity trough science-content music in learning solar system?”

1.3 Research Question

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

- 1) How is the implementation of science-content music as teaching media in learning solar system?
- 2) How is students' retention improvement in learning solar system by using science-content music?
- 3) How is students' creativity result after learning solar system by using science-content music?

1.4 Limitation of Problem

In order to make to make this research is more effective, efficient, and directed, it is needed there is a limitation of problem. The things that limit this research as follows:

- 1) Science-content music
Digital Teaching media that will be implement in this research is science-content music. Science-content music can be defined as a genre of songs, either existing tunes rewritten with new lyrics or original musical compositions, designed to teach and explain science related concepts through verse, with a well-defined melody and/or rhythm (Governor et al., 2013)
- 2) Students' retention
Human memory processes can be classified as the ability of the mind to understand, retain, and successfully recall information. Memory retention is the act or an instance of remembering or recollection there are many ways of classifying the human mind and its ability to retain information (Elizabeth, 2008). The role of retention is to store encoded events and information, and the role of recall is to re-access the retained events and information in the mind in response to external stimuli (Amin & Malik, 2014). This process of maintaining information over time is called memory (Matlin 2005). In order to maintain a reliable memory, the information processing method is the key.

3) Students' Creativity

Students' creativity refers to students' ability to express new ideas, which is students' creativity to create a new lyric contain science concept and arrange the lyrics with the melody. Creativity in this study is measured to analysis based on Creative Product Analysis Matrix (CPAM) which developed first by Besemer and Treffinger in 1981. It's concerns to three major dimension or factors that considered of product creativity.

4) Solar system (Syllabus)

Solar system is one of physics' topic learned by 7th grade in science subject. In this topic student will study about the order of astronomical objects such as sun (as the center of solar system), planet, meteor, satellite, comet, and asteroid which revolve to the sun (Kemendikbud, 2017). According to *kurikulum 2013*, the sub-topic(s) of this topic divided into four sub topics, which are: The solar system, Earth condition, Moon condition, and Eclipse.

1.5 Research Objectives

Elaborating from the research questions, the research objectives are specified as follow:

- 1) To investigate how to use science-content music as teaching media in learning solar system.
- 2) To analyze students' retention trough science-content music in learning solar system.
- 3) To analyze students' creativity trough science-content music in learning solar system.

1.6 Research Benefit

The result of this research is expected to give a good input as follow:

a. For students

- 1) Student can be involved and participate active in science learning trough science-content music.
- 2) Students are more motivated and enjoyed in following learning process.
- 3) Improve students' retention and creativity in process of learning solar system.

b. For teachers

- 1) As a reference for science teacher to improve their teaching media in solar system subject.
- 2) Provide information that students' retention and creativity can be improved through science music content.

c. For another researcher

- 1) Give information, knowledge, and experience of researcher.
- 2) Provide information about research result.

1.7 The Organization of Research Paper

This research paper contains of five chapters and several appendices. Each chapter consists of sub-chapters. The systematic of this research paper is as follows:

1) Chapter I: Introduction

This chapter outlines the background, research problem, research question, limitation of problem, research objectives, research benefit, and research paper structure. Every thoughts of this research are served in the background.

2) Chapter II: Literature Review

This chapter contains information, theory and literature of research variables. Those explanations consist of science-content music, students' retention, students' creativity, and solar system as the lesson topic, and the research relevant with this study.

3) Chapter III: Methodology

This chapter describes about the methodology used during the research. It consists of research method, research design, research subject, operational definition, research instrument, instrument analysis result, data analysis and research procedure.

4) Chapter IV: Result and Discussion

This chapter concerns with the data result and discussion of findings. The researcher analyzed and interpreted the data based on the research question. The data are presented in the form of Tables and Figures.

5) Chapter V: Conclusion and Recommendation

This chapter contains the conclusion of all the research results as the answer of research questions, also the suggestions and recommendation of the research.

