CHAPTERI
INTRODUCTION

1.1 Background

Physics is a branch of science that study about natural phenomena that are physically by observation, experiment and theory. Physics is taught through learning activities in schools by a set of activities that is designed to support student learning (Suparwoto, 2007). Physics that istaught by teachers in the class, emphasizes the learning process that demands students' abilities in mathematical, logical, rational, and verbal calculations (Rahman, 2004). The principle of learning physics is to prioritize scientific processes to produce products and to be based on scientific attitudes. The scientific process in learning physics is identical to the implementation of an activity with the scientific method (Sari & Sunarno, 2018).

There are lots of learning models, approach and learning methods that can support the process of learning physics. Based on the 2013 curriculum of Indonesia, current science learning need to use a scientific approach. Scientific learning is learning that adopts scientific steps in building knowledge through the scientific method (Puspitasari, Lesmono, & Prihandono, 2015). In line with curriculum 2013, teachers must have learning support devices in the form of teaching materials, worksheets, discussion sheets, and media used to facilitate students in understanding the material (Parmin&Sudarmin, 2013).Activities that are often carried out with various supporting devices are laboratory activity. Laboratory activity are needed so that students can understand the material maximally(Nuzul Andri Permana, Arif Widiyatmoko, 2016).

In fact, students' learning outcomes for physics subjects are relatively still low.When learning physics, it is found that the lack of seriousness of most students in learning physics is that students do not play an active role in the class and still focus to teacher center(Sari & Sunarno, 2018). Most students' do not have good learning

motivation and a positive attitude inlearning physics (Rahman, 2004). This indicated by the lack of the seriousness of students' in learning physics and the negligence of students' to do assignments from the teacher. As a result, the learning outcomes are low (Sari & Sunarno, 2018). In addition, there are several factors that affect students' learning result; which areinstrument, learning device such as curriculum, program structure, learning facilities and learning media, and teacher as learning designers. In the use of learning devices must be designed by the teacher to get the expected results (Keke T. Aritonang, 2008).

There are several ways to support the physics learning process is using media is one kind of innovative learning. Innovative learning is learning that is able to attract students' attention through active involvement of the students (Ambarsari & Santosa, 2013). Using videos in teaching is not new. By watching video, students' emotions are often triggered or heightened by the mood created by specific visual scenes, the actors, and/or the background music. A video can have a strong effect on students' mind and senses(Berk, 2009). Videoare combination of images and sound, createaattractive figure for explanation of concepts and instructing learners with content that prepare multiple senses (Vural, 2013).

Laboratory activity is very important in learning science. The purpose of laboratory work is to developstudentsconcept mastery related to the scientific content, problem-solving skill, and science processes skills. Students haveto know the connection between laboratory activity and scientific theory. With scientific inquiry, students determine the problems, developing solutions and alternative solutions for these problems, search for information, evaluate the information and communicatewith their friends(Katsampoxaki-Hodgetts, 2015).

Inquiry requires identifying assumptions, use of critical and logical thinking, and consideration of alternative explanations (Chinn & Hmelo-Silver, 2002). There are four types of inquiry which are open inquiry, guided inquiry, coupled inquiry and structured inquiry. Open inquiry requires higher-order thinking and usually has students working directly with the concept and materials, equipment, and so forth. In

guided inquiry the teacher helps students develop inquiry investigations in the classroom. Usually, the teacher chooses the question for investigation. Coupled inquiry combines a guided-inquiry investigation with an open-inquiry investigation (Dunkhase, 2001). Structured inquiry the direction already in cookbook lesson in which students follow teacher directions to come up with a specific end point or product.

Learning with guided inquiry is an effective way to vary the atmosphere of classroom learning patterns. Guided inquiry learning is group learning where students are given the opportunity to think independently and help each other with friends, and guide students to have individual responsibilities and responsibilities in groups or partners(Ambarsari & Santosa, 2013). Guided inquiry help student to develop their understanding of science with participating in hands on, open ended and student-centered activities (Irinoye, Bamidele, Adetunji & Awodele, 2014).

In guided inquiry laboratory activity, teacher gives the problem and students solve the problem by an experiment.UsuallyGuided Inquiry experiments are based on a discovery (Gaddis & Schofffstal, 2007). The utility of Guided Inquiry laboratory activity, in which students have considerable autonomy in the design and execution of the experiment (Fakayode, 2014).

The changes style in laboratory from Traditional to Guided Inquiry Laboratory activities help students more to develop scientific understanding in science(Basey & Francis, 2011). Teachers must be move away from traditional lecturing and cookbook style laboratories to activelearning strategies to help studentsin developing their cognitive processes (Tessier & Penniman, 2006).

In guided inquiry laboratory method, the experiments are similar with the expository experiments, but students did not get a lab manual.Students search for the experiment process and reach scientific information by the experiment (Ural, 2016). Guided inquiry laboratory enhanced students' learning and retention (Irinoye, Bamidele, Adetunji & Awodele, 2014).While, traditional laboratory activitystudents must be follow lab manual, students are difficult to learn scientific information and

they cannot notice the relationship between the experiment and scientific theory. As a result, students cannot reach the goals of scientific laboratory andthey are not motivated to do their best in learning science(Ural, 2016).

Learning can be influence by a complex thing which is multidimensional that are interact with the cognition named motivation(Taasoobshirazi & Sinatra, 2011). Motivation to learn refers to the choice of students to findacademic activities relevant and useful and to try to get the intended academicbenefits that they wants(Brophy, 1998). Students' motivation is show in their active engagement in the learning process, excited in challenging learning tasks, have more effort of active learning strategies and tenacity in achieving learning and can solve the difficult problem (Bandura, 1997).

Motivation toward science learning contains many factors two of them are determining the quality and science learning process. The important construct in the field of science education is motivation(Glynn & Koballa, 2007).Motivation to learn science is defined as an internal state that arouses, directs, andsustains science-learning behavior, motivation to learn science promotes student constructionof their conceptual understanding of science (Cavas, 2011).

In this research, the topic of Light and Optics is chosen because based on the information from the student learning method that is used in the class still teacher center. Teacher only delivers the concept based on the hand book, and then students were asking to answer the questions from the book. And also still lack of laboratory activity in learning light and optics, teacher still use lecturing method to delivers the concept. Students are too difficult to focus and pay attention to teacher during teaching learning activity it caused students learning outcome are low.

Previously, there are several research conducted to improve students' understanding in light and optics topic by implementing several approach, method or models, such as Virtual Laboratory Flash Animation(Permana&Widiyatmoko, 2016), interactive module with LCDS program(Arbai, Sukiswo Supeni, & Stephani Diah, 2014) andusing Direct Instruction Model(Anggraini, Zainuddin, & Miriam, 2017).

However,there is no research about Video embedded - guided inquiry laboratory activity in learning Light and Optics.

Not only to improve students understanding, some previous research are conducted to investigate the effect of guided inquiry to students motivation. Such as *Pembelajaran Inkuiri Terbimbing dengan Program Moodle untuk Meningkatkan Motivasidan Hasil Belajar Siswa* (Mufidah, 2014).

Such research could further suggest changes to educational practices. For this reason, this research was initiated to investigate students' understanding and motivation by using guided inquiry laboratory activity with video embedded among 8th Grade students. It is thought that by using guided inquiry laboratory activity with video embedded will increase students' understanding of light and optics topics and students' motivationsand students' understanding in learning light and optic.

1.2 Research Problem

The research problem of this study is "How is The Effect of Guided Inquiry Laboratory with Video Embedded with video embeddedon Students' Understanding and Students' Motivation in Learning Light and Optics?"

1.3 Research Question

The research problem of this study is "How is the effect of Guided Inquiry laboratory activity with Video Embedded on students' understanding and students' motivations in learning Light andOptic"**.** Based on the research problem, the research attempts to investigate the following questions:

1. How is the effect of Video Embedded -Guided Inquiry laboratory activity on students' understanding in learning light and optics?
2. How is the profile of students' motivation after the implementation of Guided Inquiry laboratory activity with video embedded?

1.4 Research Objective

According to the problem that has been proposed, the objectives of this research are:

1. To investigate the effect of Guided Inquiry laboratory activity with video embeddedon students' understanding in learning light and optics.
2. To investigate the profile of students understanding after the implementation Guided Inquiry laboratory activity video embedded on students' motivation in learning light and optics.

1.5 Research Benefit

1. For teacher

The research can help the teachers to create creative way of teaching and meaningful learning using Guided Inquiry Laboratory with Video Embedded in order to increase the attractiveness of teaching process in science instruction especially in light and optics topic.

2. For students

This research can help students to have a new experience of learning in class also to improve the learning quality especially in light and optics topic. Through Guided Inquiry Laboratory with Video Embedded ,it is expected that students can have a good conceptual mastery and understanding in learning science by involving the students to the experiment or practical class.

3. For other researchers

This research can help the other researchers to find out more or deeper about Guided Inquiry Laboratory with Video Embedded; other advantages or variations. Thus, this research could motivate the other research about Guided Inquiry Laboratory activity which can be done to science learning, or other subjects.

1.6 Organizational Structure of Research Paper

The structure of this research paper consists of five chapters:

1. Chapter I. Introduction. This chapter contains the background of the research, research problem, research objectives, research benefits, organizational structure of research paper and limitation of problem.
2. Chapter II. Literature review. This chapter contain the literature review about experimental learning model which is Guided Inquiry Laboratory Activity, and the other variables which are Conceptual Mastery, Motivation, and light and optics and relevant research.
3. Chapter III. Research Methodology. This chapter contains the method that is used to finish this paper, which are research method and research design, population sample, operational definition, research instrument, instrument analysis, data collection, data analysis technique, research procedure, and research scheme.
4. Chapter IV. Result and Discussion. This chapter contains the result as well as the discussion and explanation about the result of this research paper.
5. Chapter V. Conclusion and Recommendation. This chapter contains the conclusion of research paper as well as the recommendation for the future or next research.

1.7 Limitation Problem

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

1. Guided inquiry is a learningmethod that helps students to learn and acquire knowledge by themselves discovering what isbeing studied, in guided inquiry students are given a problem and the teacher will not provide the experimental procedure for the students, they have to develop by themselves under guidance ofteachers(Mahyuna, Adlim, & Saminan, 2018).In this research the researcher choose guided inquiry as teaching method that is used in teaching-learning process that is conducted in laboratory.

2. Understanding that assessed in this research involves the cognitive process dimension in the categories of remembering (C1),understanding (C2), applying (C3), analyzing (C4), and evaluating (C5) based on The Revition of Bloom Taxonomy(2001).
3. Students Motivation plays an important role in the processes of conceptual change, critical thinking, learning strategies and achievements in learning science (Tuan, Chin, & Shieh 2005).Therewas 3 types of theory that can be used to measure students' motivation which areStudents' Motivation Toward Science Learning (SMTSL), Motivated Strategies for Learning Questionnaire (MSLQ), Students' Motivation Questionnaire (SMOQ). Among the instruments that have been constructed to measure students' motivation towards science is the Students' Motivation Toward Science Learning (SMTSL) (Tuan, Chin & Shieh2005) which was used to assess junior high school students. Students' motivation is measured in this research is adapted from framework created by (Tuan, Chin, & Shieh 2005) that is SMTSL.