# CHAPTER I

# INTRODUCTION

## 1.1. Background of Study

The rapid technological developments in the 21st century require creative and innovative abilities to keep up with the times. Schools must incorporate training in creative thinking skills to enable students to face global challenges and compete in a global world. Education is a conscious and planned effort to develop students' potential, encompassing spiritual strength, religion, personality, intelligence, noble character, and skills needed by society, nation, and state. Adapting to changing times, education needs to be more creative and innovative, tailored to the needs of students. Interaction with the social community and advancements in technology encourage teachers to utilize their abilities fully in producing quality, creative graduates for society. ( Navarrete, 2013).

The teacher's role in education is to provide knowledge and evaluate student activities in the learning process. However, the current learning outcomes test instrument used is ineffective in encouraging students' creative thinking skills. As a result, students become apathetic towards the learning process and choose to surrender their fate to external factors. Creative thinking skills are crucial for developing long-term success and improving the quality of life. Unfortunately, they are rarely developed in the classroom (Newcombe, 2014). Therefore, a creative thinking instrument is needed to measure students' creative thinking abilities and encourage broader thinking as well as active participation in problem-solving. This instrument refers to the Torrance Test of Creative Thinking (TTCT), which measures four aspects: fluency, originality, flexibility, and elaboration. The TTCT consists of two tests: a verbal creativity test with answers expressed in words, and a figurative creativity test with answers expressed in pictures (Munandar, 2009).

Creative thinking is crucial in various fields as it generates new ideas from students' own thoughts. By encouraging students to be more active and express their opinions, this skill becomes a vital life skill that plays an important role in improving the quality of life for individuals and society, contributing to long-term success. (Yıldırım, 2010)

Previous research that relevant is research conducted by (Puspa Armandita, 2017), to know how students' creative thinking skills in solving problems in learning glasses. This research is qualitative research, the theory of analysis used is the theory of qualitative analysis. The results of this study are the highest evaluative thinking skills and on average the lowest proportion are original thinking skills and flexible thinking skills. In addition, research was conducted by (Yuliati, L, & Samsudin, 2018) In this study, the authors used Torrance's creativity test and physics problem-solving test to measure students' creative thinking abilities. The results showed that students' creative thinking skills in solving physics problems tended to be low. Furthermore, research was conducted by (Astuti & Adi Nugroho, 2018), This study used a quantitative descriptive research method using a written test and then the collected data was analyzed using descriptive and inferential statistics. The results showed that students who had good critical and creative thinking skills had better abilities in solving physics problems.

Then the research conducted by (Susilawati & Kaniawati, 2017), using the theory of analysis used qualitative analysis with Content Analysis techniques. The research data were obtained from the results of students' physics essay assessments and observation of the learning process. In the aspect of creativity, students can come up with original and unusual ideas, connect physics concepts with everyday experiences, and provide alternative solutions to solving physics problems. Furthermore, research was conducted by (Rahmawati, Kaniawati, & Suyatna, 2019), using the theory of analysis used qualitative and quantitative analysis and using the method used in this research is descriptive quantitative by collecting data through tests and interviews. The results showed that students' creative thinking skills in solving open-ended physics

questions were still low and needed to be improved through learning that was more challenging and involved students actively. Then the research conducted by (Fitriyani & Indrawati, 2018), used Guilford's creative thinking analysis theory to measure the level of student's creativity in solving physics conceptual problems. The results showed that students' creative thinking skills in solving conceptual physics problems were still low. Nonetheless, there are several indications that the use of a learning approach that facilitates the development of student's creative thinking can improve their ability to solve conceptual physics problems.

Based on the results of observations made at SMA Negeri 2 Medan, several indications are showing that 1) creative thinking questions are rarely used, 2) learning models such as problem-based learning are suitable for improving students' creative thinking abilities (Maayah, Karim, & Makhadmeh, 2022), 3) although creative thinking instruments are rarely used, it doesn't mean that students have low creative skills, it's just that it hasn't been measured.

Physics subjects are included in learning subjects that are required one to think creatively. Creative thinking skills are important to be developed in science subjects so that they can help solve problems, provide new original ideas, to situations related to science (Collins, 2014). In Physics Materials, optics has a lot to do with shadows and also the reflection of light which requires creativity in presenting the image which includes the four indicators of creative thinking, namely: fluent thinking, flexible thinking, original thinking and skill to balance. Base on background the author feels the want to know students' creative thinking abilities in physics learning by using creative thinking ability instruments that will be applied to optical material in class XI SMA Negeri 2 Medan for physics subjects.

## 1.2 Problem Identification

The identification of the problems in this study are:

1. The creative thinking test instrument is rarely used in student assessment instruments

2. The instrument used still measures low-level cognitive abilities (low-order thinking
3. Students feel less enthusiastic about working on physics questions because the instrument questions used have been done before in textbooks
4. Even though creative thinking instruments are rarely used, it doesn't mean that students have low creative skills, it's just that it hasn't been measured.

## 1.3 Problem Limitation

Based on the identification of the problem and so that this research can be directed and in-depth and not too broad in scope, this research is limited to:

1. Learning materials and objects in this study is Optic material and class XI, students,
2. This study uses a limited essay test instrument.
3. The test instrument developed based on Torrance's theory test

## 1.4 Problem Formulation

Formulate the research problem as follows:

1. How is the feasibility of the creative thinking test instrument developed based on validation and reliability on Optical material?
2. How are students' creative thinking skills in Optical material?

## 1.5 Purposes of Research

The objectives to be achieved from this research are:

1. To describe students' creative thinking skills in Optical material
2. To determine the feasibility of the developed creative thinking test instrument

## 1.6 Benefit of Research

### 1.6.1 Theoretical Benefit

1. Provide assessment guidelines to measure students' creative thinking skills in the optical material

2. Provide an overview of the characteristics of students' thinking abilities
3. As a reference source for the evaluation of student learning
4. As a reference and input for other researchers related to similar and further research

### 1.6.2 Empirical Benefit

1. It is hoped that through the instruments that have been given, namely indicators of creative thinking, it is hoped that students' creative thinking abilities can be measured
2. As input material for teachers in using and developing test instruments for material reference as well as for assessment materials for teachers so they can use learning models that are in accordance with students' physics creative thinking skills.
3. As input and consideration for schools in determining education policies and school goals.
4. This research can be used as a reference in designing and implementing relevant follow-up research

## 1.7 Operational Definition

This research is an attempt to determine the ability to think creatively in class XI high school students by using an instrument on optical material. To clarify the terms used in this study, an operational definition is made as follows:

1. The Torrance Test of Creative Thinking (TTCT) is a verbal and figural creativity test, verbal creativity tests consist of tasks expressed in words while figural creativity tests consist of tasks expressed in pictures.
2. Validation refers to test instruments based on experts.
3. Reliability refers to the level of stability, consistency, predictability, and accuracy of an instrument.
4. The creative thinking test instrument must be able to measure students' creative thinking skills in the optical tools