

CHAPTER I INTRODUCTION

1.1 Background

Physics is one of the branches of science that attempts to describe how nature works using the language of mathematics. It involves the study of universal laws and the behaviors and relationship among a wide range of physical phenomena (Agarwal, 2012). Physics is one branch of science and a science that was born and developed through steps of observation, problem formulation, formulation hypotheses, testing hypotheses through experimentation, drawing conclusions, as well as the discovery of the theory and the concepts (Lahmita *et al*, 2016; 632).

Physics lessons in senior high school are intended as a means to train students to be able to master the knowledge, concepts, and principles of physics, have scientific skills, have science process skills, and critical thinking skills. Seranica (2018), Critical thinking skills are required and critical thinking skills is needed to address the problem face in life. Critical thinking skills is also a part of academic success skills (Motlan *et al*, 2018). (Kusuma, 2018) With critical thinking, students have the skills to solve the problems of their social life and daily life. One of the most important things students should have, especially in the subject physics is critical thinking. A person who has the skills to think, is expected to be easy in learning and deeping something. So that it can enrich the mastery of students concepts. Critical thinking is one of the most influential things in learning. Students have not been able to find their own concept of science that has been studied and only apply the concept given by the teacher. Harefa *et al*, 2016 said Critical thinking is a must in problem solving decision making, as an approach to analyzing assumption and scientific discovery finding.

According to Ennis (1995) shares six basic elements of critical thinking through approach of FRISCO (Focus, Reason, Inference, Situation, Clarity, and Overview) (Kusuma, 2018). The important characteristics of students who have the character to always think critically are as follows: Looking for statements or questions that clearly mean or mean, Looking for a basis for a statement, Try to get the latest information, Use and mention sources that can be trusted, Consider

the situation as a whole, Trying to be relevant to the subject matter, Try to remember initial or basic considerations, Look for alternatives, Be open, Take a position (or change position) if the evidence and the basics are enough for him to determine his position, Looking for precision as thoroughly as possible, Dealing with parts in sequence to reach the entire complex whole, Use their own abilities or critical skills, Sensitive to feelings, levels of knowledge and the level of complexity of other people's thinking, Using other people's critical thinking skills. Widoyono (2009), said that critical thinking skills need to be developed in students because through the critical thinking skills students can more easily understand concept more deeply, be sensitive to the problems that occur so they can understand and solve problems and be able to apply conceptual concepts in different situation.

The results of observations at SMA N 1 BERASTAGI show 67.64% of students choose physics as a boring and uninteresting lesson, 70.58% of students don't really listen to teachers teaching physics, 64.70% of students do not like physics because the material is not fun, 58.08% of students are not enthusiastic in learning physics because the teacher teaches in ways that do not vary, 69.85% of students do not want to ask the teacher if something is not understood, 67.64% of students are not active while studying Physics. Based on the results of interviews with teacher, student's cognitive learning outcomes are low, which is below standard of minimum completeness of mastery learning (KKM), where KKM in physics subjects is 75. One of the reasons students have difficulty in understanding the material is a monotonous way of teaching teachers. In the learning process the teacher explain the material more and the students only listen to the teacher's explanation. As a result will cause boredom in students who affect the lack of interest in the material delivered. So that the students' understanding of the physics material is low and here is no improvement of students' thinking skills. Where as in the process of learning, the role of the teacher is very important in the motivation of the teacher, guidance and explanation of the teacher so that students are able to improve students' understanding of teaching materials.

In Physics subjects, the learning conditions of students who focus on material, writing and memorizing must be changed to share knowledge, act in question, think critically and actively find knowledge to improve student learning outcomes especially for students' critical thinking skills. The learning process of physics should be more emphasis on student centered learning and the process of learning physics is not a large amount of information that must be memorized students, so that students can gain a learning experience. Therefore, the learning process should be more emphasis on the importance of meaningful learning. (ompusunggu, 2016). Therefore to form learning that can shape critical thinking, learning is needed that supports this goal. Some research showed that Inquiry learning can train the skills of critical thinking when studying, students material becomes critical and analytical to whatever information is acquired if it does not fit their reasoning (Fuad *et al*, 2017). Inquiry learning process not only acts as a receiver lecturer lessons through verbal explanation, but the role is to find their own core of material. Inquiry method can develop thinking skills of students. Thus this learning method in addition to results-oriented, it will also improve learning process (Motlan *et al*, 2016)

One alternative learning model that can be applied in the physics learning process is a guided inquiry model. The material delivered by the teacher is not only given and accepted by students, but students are nurtured in such a way that they get various experiences to find out the concepts planned by the teacher (Asmawati, 2016). Guided inquiry related to activities that focus on the looking for knowledge by students that are useful for developing critical thinking skills. The process of critical thinking are mental activities such as: solving problems, analysing assumptions, reasoning rationally, evaluate, doing investigation and make a decision. Making decision stage, students will search, analyse, and evaluate information to make conclusions based on facts (Hidayati, 2016). Through guided inquiry learning, the teacher invites students to be active in learning. Students are invited to actively think about recognizing problems, expressing problem solving ideas, designing their own experiments to answer the problems faced, conducting experiments to find answers, analyzing to interpret

data, finding answers and discussing results until concluding the results. Guided inquiry is capable of practicing intellectual skills, critical thinking and being able to solve problems scientifically (Masitoh, 2017).

Research of models with the type of guided inquiry has been made by solihin *et al*, (2018) in SMA Negeri Plus Sukowono, the result showed that the average value of critical thinking skills through post-test 67 in the experimental class and 62.5 in the control class. Amijaya *et al*, (2018) The critical thinking ability showed that of experiment class who learned by guided inquiry learning model increased 27.49 point (38.14 to 65.63) while critical thinking ability of control class increased 18.56 point (36.03 to 54.59).

In addition to the benefits of critical thinking skills in learning also has a role as a provision for students to face the future. The background above encourages the writer to conduct research to see the improvement of critical thinking skills of berastagi high school students through guided inquiry learning model. . Therefore in this study the writer will compare the improvement of critical thinking skills between students who get a guided inquiry learning model, and students who get a conventional learning model. Then the author feels the need to conduct research on:" The Effect of Guided inquiry Learning Model toward Students' Critical Thinking Skills about Momentum and Impulses in Class X SMAN 1 Berastagi A.Y 2018/2019 ".

1.2 Problem Identification

Based on the Background described above, then the identification of Problems in this research are :

1. The low student critical thinking skills in the subject of physics.
2. Students are less active in Learning Physics, sonot able to think critically and dare to express his opinion.
3. Students assume physics is a boring learning.
4. The learning model used is a Teacher center.

1.3 Problem Limitation

Based on the Problem Identification, so that the limit of the problem in this research are :

1. The Learning model used is a Guided Inquiry Learning Model in experiment class and Conventional Learning Model in control class.
2. The subject studied is students class X SMA N 1 BERASTAGI A.Y 2018/2019.
3. The topic instructed is Momentum and Impulse.

1.4 Problem Formulation

Based on the above problem definition, then that becomes the problem in this research are :

1. How is the student critical thinking skill using guided inquiry learning model on impulse and momentum in class X SMA N 1 BERASTAGI A.Y 2018/2019.
2. How is the student critical thinking skill using conventional learning model on impulse and momentum in class X SMA N 1 BERASTAGI A.Y 2018/2019.
3. How is the improvement of student critical thinking skills using guided inquiry learning model.
4. How is the cognitive learning outcomes in experiment class using guided inquiry learning model.

1.5 Research Objectives

The objective of this study are :

1. To know the student critical thinking skills using guided inquiry learning model.
2. To know the student critical thinking skills using conventional learning model.
3. To know the improvement of students critical thinking skills that using guided inquiry learning model on momentum and impulse.

4. To know the cognitive learning outcome in experiment class that using guided inquiry learning model.

1.6 Research Benefits

1. For students, is expected to train the skills of critical thinking in process of learning of physics.
2. As input for a physics teacher in choosing appropriate learning model in order to facilitate the learning of physics.
3. For other researchers, as a comparison material and enter for similar research using different learning and concepts.

1.7 Operational Defenition

1. Inquiry Learning Model is a series of Learning activities that emphasize the process of thinking critically and analytically to seek and find their own answer to the problem in question (Joyce and Weil, 2003).
2. The Guided inquiry model is an Inquiry learning Design which in its implementation the teacher provides sufficient guidance or instruction to the students. The Guided Inquiry Learning Model involves students in answering teacher questions through teacher-led inquiry (Kuhlthau, et al., 2012).
3. Critical Thinking is reasonable of thinking based on logic that focuses on determining what to believe and do and a process that aims to make decisions that makes sense, so what we do is the best and can be done right (Rusyna, 2014).