

CHAPTER I

INTRODUCTION

1.1. Background

Physics is one of the branches of Natural Sciences, which is a science that studies the phenomena of nature and interaction in it. Physics is one of the important lessons for students. It is listed in the function and purpose of physics subject in high school that the subjects of physics are: (Depdiknas, 2006)

- i) Resting beauty and order of nature to increase confidence in God Almighty, ii) Fostering scientific attitude which include; honest and objective about the data, open to accept an opinion based on specific evidence, critical of the scientific statement, and can cooperate with others, iii) Give the experience to be able to propose and test hypotheses through experiments; designing and assembling instrument experiments, collect, process, and interpret data, prepare reports, and communicate the results of an experiment in writing and orally, iv) Develop the ability to think analytically inductive and deductive using the concepts and principles of physics to explain natural events and resolve the problem well both qualitatively and quantitatively, v) Knowing the knowledge, concepts and principles of physics, as well as having the knowledge, skills and scientific attitude.

From the explanation above, it is clear that the implementation of the physics subjects in high school is to develop and train students to master the knowledge, concepts and principles of physics, has scientific skills and critical thinking skills.

One problem facing our education is the weakness of learning process. Student didn't encouraged to develop their thinking ability in learning process. Learning process in class toward to the ability of students to memories the information; Student's brain forced to remembering and be piled up on the information without demand to understanding the information to relate it to daily life. Finally, when students graduate from school, they clever as theoretically, but poor the application (Sanjaya, 2006: 1). According to data reported by TIMMS (Trends International Mathematics and Science Study) Indonesian student achievement in Southeast Asia is very low. The results of TIMSS 2011, ranked Indonesian children occupied position 40 of the 42 countries for science achievement. On average science achievement scores in a row 406, still

significantly below the international average score. This shows that the output of education in Indonesia has not reached the maximum results, where it also shows that not maximal students' understanding of the concepts being taught.

Application of the learning process in Indonesia is less encouraging the achievement of critical thinking skills. Learning process in the classroom directed to the student's ability to memorize information. Though the critical thinking skill is one of the authorized capital or intellectual capital is very important for everyone and is a fundamental part of human maturity. Therefore, the development of critical thinking skills become very important for students at every level of education. Two factors cause the development of critical thinking abilities decrease is curriculum is generally designed with a target of extensive material so that teachers more focus on completion of teaching materials and lack of understanding of the learning method that can improve critical thinking abilities.

According to Richard Paul (Fisher, 2001: 7), Critical thinking is that mode of thinking—about any subject, content, or problem—in which the thinker improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It presupposes assent to rigorous standards of excellence and mindful command of their use. It entails effective communication and problem-solving abilities, as well as a commitment to overcome our native egocentrism and sociocentrism. The process of critical thinking skills is inseparable from the understanding student's concept. To be able to think critically, students should have an understanding of a particular concept so that a good understanding of the concepts will support students' critical thinking abilities. Learning that stimulate critical thinking skill will increase the learning outcomes of students like understanding the matter or concept mastery. Therefore some efforts do to develop critical thinking or using critical thinking learning to develop learning outcome. Learning outcome and this skill is related one to others.

Based on observations by the author in SMA Negeri 2 Balige when Integrated Field Experience Program, when teaching and learning process, teachers were more frequent use of direct teaching models with explaining the subject matter, followed by giving examples that relate to the material, giving exercises and the latter giving the task to the students continued to work at home so that students learn physics oriented with practical formulas for directly solving the physics problems and less attention to the concepts of physics that exist in the problem. Learning models like this if it persists continuously can cause the perceived student learning less challenging and seem boring. Potential, creativity and ability that exist in every student also will not grow optimally in particular the ability to encourage students to think critically in understanding the phenomena of nature, or the application of the physics lesson.

One of the solutions to develop the critical thinking abilities of student is by using problem based learning model. Problem based learning model is a model of learning that is relevant to the physics lesson. In principle of Problem based learning model, students themselves who are actively searching for answers to the problems set by the teacher. In this case the teacher more as a mediator and facilitator to assist students in constructing their knowledge effectively. Problem-based learning model is believed to be potentially empower critical thinking abilities. Students are given the challenge of the real-life problems associated with physical material presented. So that students are more aware of the concept of physics that deals with everyday life.

Model of problem-based learning is an instructional model that presents a contextual problem that stimulate learners to learn. Learners who learn to solve a problem then they will apply their knowledge or trying to find the necessary knowledge. Learning can be more meaningful and can be expanded when learners are dealing with a situation in which the concept is applied and PBL models can also improve the ability of critical thinking, fosters initiative learners in work, internal motivation to learn. The success learning based on solving problem have high transfer value, and have retention level it means student have long term memory. So that benefit of learning outcomes that be reached by learning based

on problem is higher than learning by conventional learning process. Learning based on problem courage student to the optimal learning activities, effort to knowing the solution of the problem, learning like that enable student reach high understanding to what student learn. Beside it, learning process emphasize to the scientific thinking principle, critical and analytical thinking (Sumiati & Asra, 2013: 57).

Based on the background described above, the researchers interested in conducting research entitled " **The Effect of Problem Based Learning Model on Critical Thinking Ability of Students in Dynamic Fluid Class XI MIA at SMA 2 Balige Academic Year 2014/2015** ".

1.2. Identification of Problem

Based on the background of the problems that have been mentioned above, can be identified some problems related to physics, as follows:

1. Low critical thinking abilities of students in physics lesson
2. Students are accustomed to studying Physics with oriented practical formulas in solving physics problems directly and less attention to the concepts of physics that exist in the problem
3. Students assume Physics is a subject that is less challenging and seem boring

1.3. Limitation Problem

Problems that developed in this paper should be limited to be more focused and provide a clear picture of the issues that will be reviewed. In accordance with the identification of the problem, limit the problem in this paper is as follows:

1. Learning model used is a Problem Based Learning Model in Experimental class and Direct Instructional Model in Control Class.
2. Conducted to determine the effect of Problem Based Learning Model on Critical Thinking Ability of students.

1.4. Problem Formulation

Based on the background, identify problems, and limitation issues, the research problem can be formulation as follows:

1. How student's critical thinking ability that learn using problem based learning model?
2. How student's critical thinking ability that learn using Direct instructional model?
3. Does the students critical thinking ability in Dynamic Fluid that learning by problem based learning is better than direct instructional model in Class XI MIA SMA Negeri 2 Balige Academic Year 2014/ 2015?

1.5. Research Objective

The objective of this research are:

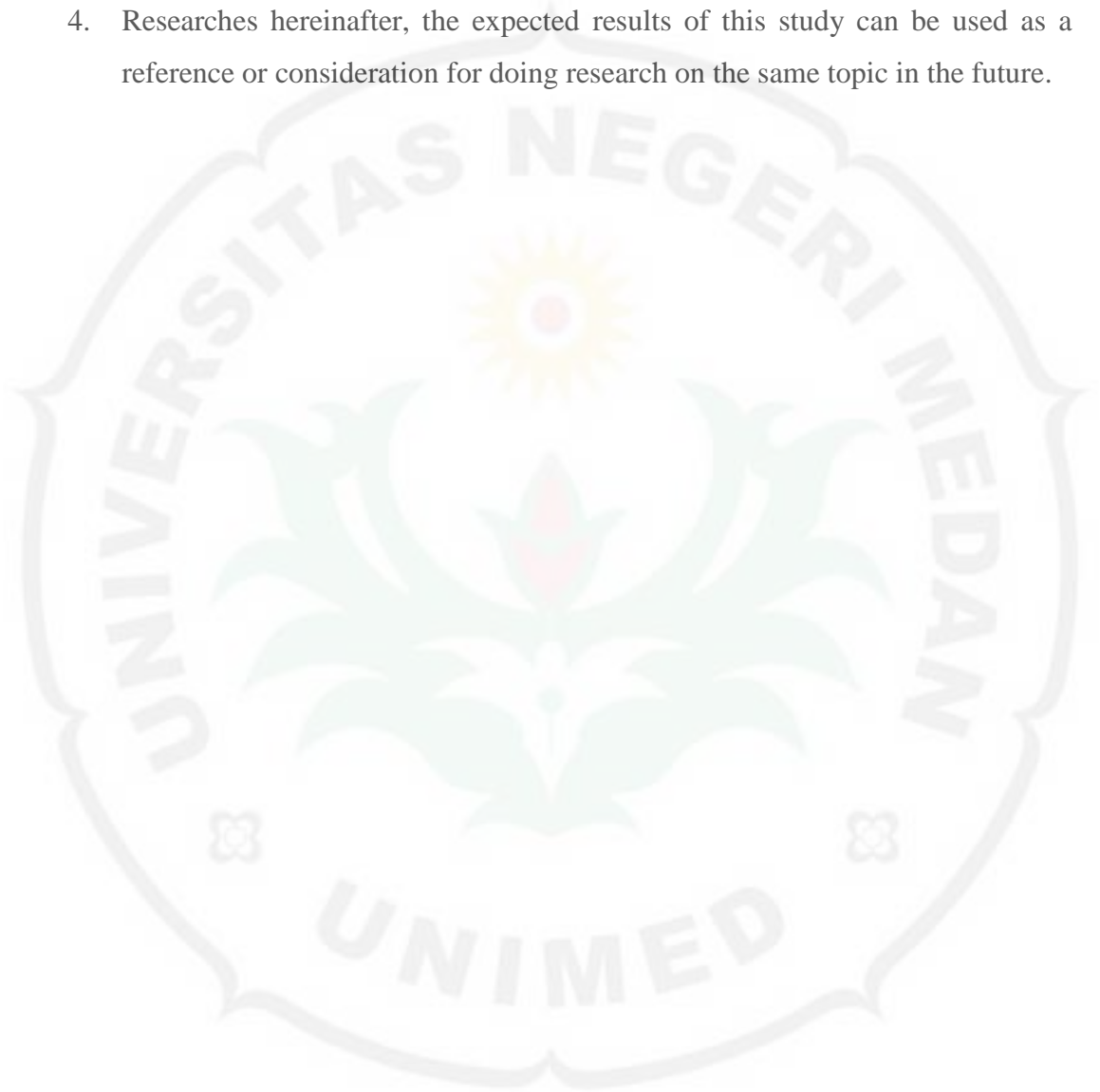
1. Analyzing how students' critical thinking ability that learn using problem based learning model.
2. Analyzing how student's critical thinking ability that learn using Direct instructional model.
3. Analyzing is it critical thinking ability of students that learn using problem based learning model is better than direct instructional model

1.6. Benefits of Research

The results of this study are expected to provide benefits to various parties, including the:

1. For Students, is expected to train students to develop thinking critically in the learning process of Physics
2. For Teachers, is expected to be an alternative model of learning and reference in improving students' critical thinking abilities in the process of learning physics.
3. For Schools, expected as resources need to design the learning system with the model of Problem Based Learning as an effort to improve students' critical thinking abilities in Physics.

4. Researches hereinafter, the expected results of this study can be used as a reference or consideration for doing research on the same topic in the future.



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