

CHAPTER I

INTRODUCTION

A. Background

Learning objectives is not only understood the concepts and principles, but also makes the students have the ability to apply the concepts and principles that have been understood in daily life. In that regard, the system of education, including learning and assessment of learning outcomes is expected to change the learning pattern from teacher-centered and subject matter oriented to student centered and oriented to the development of life skills, Thinking skills, social skills, academic skills, and vocational skills (Ministry of Education, 2003).

Learning science including physics is not only the acquisition of knowledge in the form of facts, concepts, principles or theories, but learning will be more meaningful if the students have experiences from learning science. (Ausubel Learning Theory, 1968).

Learning of physics including concept of Newton's law, according to the vovi vatmawati yuli research (2008) this concept is difficult to understand because students just listen to the teacher's explanation and did not apply the concept of Newton's law in everyday life. Learning the concept of Newton's law is also required to solve a problem in everyday life, in solving problems in everyday life students should have creative thinking, The importance of creativity contained in the System of National Education No. 20 of 2003, which in essence is through education among others are expected to develop the potential of students to be a righteous man, noble, competent, creative, and independent.

According to Utami Munandar (2004) based on the results of a survey conducted Indonesian Education Sector Survey Report, explained that education in Indonesia emphasis on routine skills and sheer memorization. Students are usually not encouraged to ask questions and use the imagination, raise issues themselves, seeking answers to the problem or show a lot of initiative. If it is

allowed, it means if the student continues to be restrained by the teacher in the learning process, it is feared will impact negatively on the improvement of students' creativity, and creativity is important to improve. To cope these things need to be applied a learning model that can improve creative thinking skill, one of which is Project-Based Learning.

Project Based Learning is an approach to instruction that emphasizes “authentic learning tasks grounded in the personal interests of learners” (Grant, 2009, p. 1). The Buck Institute for Education calls PBL “a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks.” (Markham, 2003, p. 4). However it is defined, Project Based Learning presents students with real world, multidisciplinary problems that demand critical thinking, engagement, and collaboration.

Results from Siti Nurhayati Sufyani research (2010) on learning concluded that the project-based classroom-based emotional intelligence project significantly better than classes and class encapsulates practical, creative thinking capability data showed an average increase in with a summary of learning through the creation of 0.45 (medium), assisted learning lab at 0.38 (medium) and projects based learning of 0.50 (medium). So Project-based learning experiences will help teacher figure out how to make learning come alive for students. Project based learning make students are actively engaged in inquiry work, where they are reading, talking, questioning, analyzing and creating products, in large groups, small groups, independently toward the goal of demonstrating their learning based on self-selected compelling questions and topics in physics.

One of efforts to overcome above problems is by implement meaningful learning system, in the sense that students felt knowledge acquired is really useful. One model of learning that appropriate for the purpose is project-based learning model.

Robotics projects will be adopted as the implementation of project based learning. The Robotic project seeing the development of the technology world is currently growing very rapidly in various scientific fields, one of which is the field of robotics. Robotics technology has been applied ranging from industry to education, researchers who have experience in the world of robotics, students, until the children are mostly as users only. As it grows, robotics technology has become one of the media and educational games for elementary school students to high school. Therefore the robotic project as a platform to introduce robotics technology in the next generation early.

Students who are the subject of research are Student in Salman Alfarisi School Bandung. From the preliminary study in junior high school, especially in the Salman Alfarisi School Bandung, there is a robotics club which consists of students who study about the robot. So, it is possible for students to perform robotic project and incorporate concepts of Newton's law in the robotics project. Students in initially does not know the relationship between concept of Newton's law and robot technology. This robotic project can help student to understand the concept of Newton's law that exist on the robot.

In research that will be conducted, the concept of Newton's law is used as teaching materials that will be studied in this research. This concept of Newton's law is possible to implement project-based learning with the robot as a project that can be directly performed by the students, so that project-based learning activities through this activity can still be performed. In addition, these teaching materials have quite a lot of applications in industry and housing, such as the working principle of mobile robot and humanoid robot using the concepts of Newton's law. This Method is expected to result in meaningful learning, more applicable learning and improve student creative thinking skill.

Based on the description above, this research discuss about robotic project as Implementation of project based learning in Newton's law concept as a method to improve creative thinking skill for Student which students can demonstrate

mastery of Newton's law by creating, and presenting, a research-based project that is driven by their own interest in a topic and allows them to work within the same parameters as real researchers.

B. Research Problem

Based on the background of the issues outlined above, the problems in this study can be formulated in the form of a question as follows: "How is the improvement of students' creative thinking skill through robotic project as implementation of project based learning?"

C. Research Question

Based on research problem in this context analysis of project based learning in learn concept of Newton's law is focused on three main questions. They are:

1. How is the improvement of student's creative thinking skill on Newton's law concept through robotic project as implementation of project based learning?
2. How is the final product of the students in the form of robot as the result of the project in Newton's law concept?
3. How is students' response after implementing robotic project on Newton's law concept as implementation of project based learning to improve students' creative thinking skill?

D. Problem Limitation

To be more focused research, the research is limited to the method of learning, the development of creative thinking, student learning activities, the project that implemented on implementation of the learning model with the following limitations:

1. The learning model used is the model of project based learning.
2. Increased creative thinking, increase referred to in this study is an increase in students creative thinking in solving problems in daily life after the learning materials is given.

3. Content that is implemented is newton's law concept for junior high school.
4. Student activity involvement is limited to the making of the project, the project is implemented within the project-based learning is a robotic project.

E. Research Objective

Generally, this research aims to find a solution of problem solving in learning process of newton's law concept. The study specifically aims as follows:

1. To obtain the data about the improvement of student's creative thinking skill on newton's law concept through robotic project as implementation of project based learning
2. To obtain the data about final product of the students in the form of robot as the result of the project in Newton's law concept.
3. To obtain the data about students' response after implementing robotic project on Newton's law concept as implementation of project based learning to improve students' creative thinking skill.

F. Research Significance

The study is expected to provide benefits for students, teachers, schools and other educational institutions.

1. For students, through this research are expected students to improve creative thinking skill on the concept of Newton's law.
2. For teachers, this research is expected to provide input about learning strategies in an effort to improve creative thinking skill on concepts of Newton's law.
3. For schools and other educational institutions, this research is expected to be used as information and studies in the development of learning science especially Newton's law concept, and as inputs to other researchers.

G. Organization Structure of Research Paper

To simplify the discussion and drafting research reports, following the author plans to make the organizational framework of the research described by systematic writing as follows:

Chapter I Introduction, including background, research problem, research question, problem limitation, research objective, research significance and organization structure of research paper.

Chapter II literature review, including description of basic theory of the research. This research is reviewing project based learning, robotic project, creative thinking skill, and concept of Newton's law.

Chapter III research methodology, discuss about location, subject, and population of research, research design, the research methods, operational definition, instructional tool, research instrument, process of instrument development, data collection techniques, and data analysis techniques.

Chapter IV results and discussion, contains the data processing, the discussion and analysis of research data.

Chapter V Conclusions and Recommendations, discusses the conclusions of the research conducted and suggestions given.