

CHAPTER I

INTRODUCTION

1.1 Background

Education is an interaction between educators and students in achieving learning goals that can be carried out and planned by educators to produce a good learning process so that students have intelligence, good personalities, and are active in society, nation, and state. According to Undang-Undang nomor 20 Tahun 2003 concerning the National Education System states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills they need, society, nation, and state.

The problem faced by the world of education today is the low quality of qualified graduates (Megawanti,2015). In the learning process, there are many things that must be observed to increase the quality and quality of learning outcomes, namely in the form of methods, models, procedures, approaches, or the selection of learning materials that must be developed in teaching and learning activities.

In a school environment, education is more formal, where teachers are educators. Formally teachers have been trained as educators in educational institutions. Teachers must carefully plan and prepare work to carry out their duties as educators. The teacher systematically compiles teaching materials in detail with clear objectives and well-designed learning tools. (Sukmadinata,2013)

Physics is a part of science that studies and understands natural phenomena that occur in everyday life empirically, systematically, and rationally. Physics lessons are related to the development of intelligence and national insight to teach science and ways of thinking that play an important role in supporting science and technology, thus encouraging teachers to design and implement education that is

more effective and focuses on understanding concepts so that they can be applied in life. This makes learning physics not only about facts, but how students can master the concept of physics itself (Astalini et al, 2019).

In general, the implementation of physics learning that occurs in schools shows that students tend to be lazy to think. In addition, in answering questions, they simply memorized and quoted from books, so their mastery of concepts was less developed. This means that their scientific thinking skills have not developed (Isna et al 2017).

Understanding physics does not have to be taught directly by educators. Students can understand in various ways, especially in the 4.0 era. Utilizing technology is one way to understand the concepts of physics which then from these concepts can be applied in everyday life. So, an educator must have effective methods and strategies so that all concepts can be conveyed properly to their students.

In the past, the only source of learning for students was the teacher. Therefore, educational activities are often traditional. But now it's different, the growth and development of science and technology is almost out of control, so the epidemic has spread to the field of education (Bahri, 2010).

Based on the results of interviews conducted, the Physics teacher of SMA Negeri 1 Tanah Pinem said that currently student learning tends to be passive by not responding when the teacher asks or explains the material. In addition, in learning, teachers rarely apply problem-based learning models and teachers only emphasize learning outcomes. Meanwhile, the learning model used is a model of lectures, discussions and taking notes on the material read by the teacher. Most students are less interested and not active in participating in the learning process, the teacher does not stimulate children's thinking skills in solving social problems, especially those related to physics subjects, and students are less enthusiastic about participating in learning. This turned out to have a negative impact on the low learning outcomes of students on subjects. And of course not in accordance with

the demands of the 2013 curriculum used, resulting in low student understanding of the material being studied.

The books used in learning are worksheets and printed books and the learning process in this school has not utilized multimedia or electronic teaching materials in learning. Even though in today's classroom learning can be filled with all kinds of technology that can be used for learning. These sources support learning activities and assist students in acquiring knowledge. One form of utilization of technological developments is to make printed teaching materials electronic, one of which is teaching materials in the form of e-modules (Ramirez-Velarde, Garcia-Rueda, and Alexandrov 2007).

Based on the information distributed, it turns out that this school needs teaching materials that can make students more enthusiastic, interested and active in participating in the physics learning process as well as to stimulate students' thinking skills in solving problems, especially those related to physics subjects in students' real lives. so that students learn not only about knowledge but also feel and experience.

One solution that can be used to overcome this problem is the use of problem based learning (PBL) learning models. Problem based learning is a learning process that confronts students with a real problem before starting the learning process, which spurs them to research, describe, and find solutions. Learning with the problem-based learning model has advantages such as being closely related to the real life realities of students, so that students learn not only about knowledge but also feel and experience. in his daily life.

The government in the Regulation of the Minister of Education and Culture Number 65 of 2013 concerning Process Standards recommends an appropriate learning model to be applied based on the 2013 Curriculum, one of which is the problem-based learning model (Permendikbud, 2013). Problem based learning is a learning model that involves students in an investigation that allows them to interpret and explain phenomena around or the real world and build their understanding of these phenomena (Rusman, 2014). Problem based learning is an

innovative learning model and provides active conditions for students, so it is relevant to be used in learning with the characteristics of students who are passive during learning (Yasinta & Karyanto, 2016).

Work and energy is the material description is very much and length, in addition the formula used too much. Due to time constraints, students are forced to understand the formulas and explanations of the material in depth. From the problems faced by SMA Negeri 1 Tanah Pinem, the authors are interested in providing solutions to overcome the problems above, such as: the scarcity of books and worksheets, as well as the scarcity of other learning resources by developing learning materials in the form of electronic modules (e-modules) designed with the help of certain applications to equip students with new knowledge.

Based on the results of interviews conducted, researchers will develop a teaching material in the form of a learning module. The module to be developed is in the form of electronics. In this e-module, it will be made based on the learning model recommended by the government. Curriculum 2013 is a problem based learning model which is essentially a contextual learning model that guides students to be active (student center) so that students can use knowledge that will be applied in life. everyday life as critical and active learners, which improves student learning outcomes. Problem-based learning is a learning method that makes students the center of learning through unstructured problem solving (Torp & Sage, 1997). This is relevant to what Imaningtyas et al (2017) explained that the application of PBL-based e-modules can improve learning outcomes. Wulandari & Sholihin (2016) also explained that the application of the PBL model can significantly improve learning abilities because PBL can stimulate students' interest in scientific issues, increase scientific inquiry, and encourage students' sense of responsibility towards the surrounding environment. The application of the Problem Based Learning (PBL) module can foster students' thinking skills to solve problems in everyday life and equip students for higher education. According to research conducted, the application of PBL-based modules is highly recommended in physics learning because it can improve student learning outcomes and scientific attitudes (Isna et al 2017). In addition, Rokhim dan Prayitno (2018) in their research add that the PBL-

based Physics module can improve students' critical thinking skills because PBL has the characteristics of formulating problems and determining alternative solutions.

Previously, there have been several studies that have developed problem-based learning modules. As research conducted by Halik et al showed that the results of the module validation in the category were very valid, practical because the average percentage of student responses and teacher responses in the category was very positive; effective because the average teacher ability to manage learning is in the very good category, the average percentage of activity is in the good category, and the percentage of mastery learning reaches classical mastery (Fitriani Halik et al. 2019), besides that Jeliana Veronika Sirait , et al (2016) have also done research on the development of teaching materials entitled "Development of Physics Teaching Materials in Scientific Inquiry-Based Dynamic Fluids to Improve Learning Outcomes." The results obtained in this study were the results showed that scientific inquiry-based teaching materials developed could improve student responses, activities and learning outcomes. students at each meeting. So it can be seen that using the module (teaching materials) can give good results for student learning outcomes.

E-modules are electronic teaching materials, which are packaged in a uniform and ordered manner in line with the characteristics of the teaching materials, which enable students to learn independently according to their own dexterity and abilities. Therefore, with the design and manufacture of this electronic module, it is hoped that it can be used for facilities in teaching and learning activities both offline and online or as independent learning materials in the future. The types of electronic teaching materials that will be designed and developed have been verified by many experts to make the media suitable for use, and can also reduce a monotonous or boring learning atmosphere and make the learning process more practical, interesting, interesting and effective.

This e-module is made by utilizing IT so that it can increase the enthusiasm of students and the quality of learning, as well as being able to stimulate them to

think critically in understanding learning materials and concepts. Based on these problems, the researchers are interested in carrying out research with the title: *The Development Of E-Module Based On Problem Based Learning On Work And Energy Material To Improve Students Learning Outcomes In SMA Negeri 1 Tanah Pinem.*

1.2 Problem Identification

Based on the background of the problem, the researchers identified various problems, namely as follows:

1. The teaching materials used still use printed materials such as thick books so that students get bored.
2. There is no electronic module that can be easily accessed by students, precisely in physics.
3. Students have not been able to use technology effectively as a means of learning.
4. Learning is still centered on the teacher.

1.3 Problem Limitation

In order to achieve the goal as expected, the authors limit the problem of this research as follows:

1. The research was conducted at SMA Negeri 1 Tanah Pinem with students of class X MIA 1 even semester as research subjects and the material was limited to work and energy materials.
2. The Development of this e-module is assisted by an application.

1.4 Problem Formulation

Based on the limitations of the above problems, then that becomes the problem formulation in this research is as follows:

1. How is the validity physics e-module based on problem-based learning to improve students learning outcomes?
2. How to practicality physics e-module based on problem-based learning to improve students learning outcomes?

3. How is effectiveness physics e-module based on problem-based learning to improve students learning outcomes?

1.5 Research Objectives

In accordance with the formulation of the problem above, the objectives of this research are as follows:

1. To analyze the validity of the physics e-module based on Problem Based Learning to improve student learning outcomes according to expert lecturers.
2. To analyze the practicality of physics e-modules based on Problem Based Learning to improve student learning outcomes according to student and teacher.
3. To analyze effectiveness of physics e-modules based on Problem Based Learning to improve student learning outcomes.

1.6 Research Benefits

The benefits of this research are:

1. The results of this research are expected to increase knowledge, especially in education science
2. This research is expected to provide information on the creation of E-Module Based on Problem Based Learning as a physics learning media in SMA on Work and Energy to improve the quality of education, enhance the spirit of learning and increase the level of students understanding of the material presented by the teacher.
3. Improve student achievement and support the quality of schools and the accreditation of the school.
4. Can be used as learning media for SMA students.

1.7 Operational Definition

To avoid different interpretations in understanding each variable in this study, an operational definition is given to clarify it. The operational definition of the researcher is:

1. Module is a form of printed teaching material that is designed in a structured and systematic way to assist the learning process, it can be used independently by learning participants because the module is equipped with instructions for self-study. In this case, students can carry out their own learning activities without the presence of the teacher directly.
2. E-modules are digital learning media that are systematically arranged so that students can learn independently
3. Problem Based Learning (PBL) is a learning model that makes the problems that exist in the surrounding environment as the basis for obtaining concepts and knowledge through problem solving that forms a learning atmosphere which was initially only limited to the transfer of information from educators to students into a learning process that focuses on to build knowledge based on the experience and understanding gained by students either individually or in groups.
4. Learning outcomes are a process to determine the extent to which students are able to master learning after participating in teaching and learning activities, or the success achieved by a student after participating in learning activities marked by certain numbers, letters, or symbols agreed by the education provider.