

CHAPTER I

INTRODUCTION

1.1 Background

The era of the industrial revolution 4.0 presents challenges and opportunities for educational institutions. Educational institutions must be able to balance the education system from time to time. The education system is expected to equip students with critical and problem-solving skills, creativity and innovation, as well as communication and collaboration skills. This era is an era in the use of digital technology, where society has experienced very rapid changes, namely the development of information and digital technology which has had many impacts on the educational process.

The 2013 curriculum is basically an adaptation of the 21st century education concept that requires abilities, knowledge, skills, attitudes, and mastery of technology as a support. To achieve this, the Ministry of Education and Culture implements the Revised 2013 Curriculum which is expected to meet the needs of the education system in the era of the industrial revolution 4.0.

The rapid development of science and technology brings a new paradigm to printed teaching materials such as modules. According to Wena (2014) the module is a form of print media that contains learning units with components that students can use to evaluate self-skills with a little help from the teacher so that students can achieve their goals independently and can determine where to start the next learning activity.

The large number of smartphone use by students resulted in students being more interested in viewing writing through their respective cellphones. Currently, technology products provide an alternative in the form of modules that can be accessed and used by students using smartphones, computers, or laptops as the main device, known as electronic modules (e-modules). E-module is a form of presenting independent teaching materials that are systematically arranged in certain learning units that are presented electronically, where each learning activity is a navigation

that makes students by presenting them a more interactive program with video tutorials, animations and audio (Kementrian Pendidikan dan Kebudayaan, 2017).

Based on an interview with one of the physics teachers, it was found that the school used teaching materials in the form of textbooks equipped with worksheets, both of which were purchased from certain publishers. Unfortunately, only a few students have these teaching materials due to the lack of availability of books from schools. The online learning system that has been in effect for a long time also results in a lack of understanding of physics concepts, resulting in a decrease in learning outcomes.

In student questionnaires, students who have teaching materials stated that the delivery of content in the teaching materials provided is complicated so that students are reluctant to read and cannot study it independently. Not a few students also think that physics is difficult so that it requires interesting and easy-to-understand learning, and more interactive learning can be in the form of animations, pictures, or videos in a learning material that is presented with clear concepts. Therefore, we need a solution that is to generate e-modules.

Research related to the success of generate e-module has previously been carried out by Pratiwi et al. (2017) aims to generate contextual learning modules with validated, interesting, easy, useful, and effective results with moderate qualification n-gain values. Menrisal, Yunus, and Rahmadini (2019) in designing and manufacturing electronic learning modules to get validity results in the valid category, practicality in the very practical category, and effectiveness in the very effective category. In addition, the research of Syafitri et al. (2019) generated a product in the form of a HOTS-oriented e-module for physics learning which was declared to be very valid so that it was suitable for use in the learning process.

Until now, most of the problems that plagued the world of education, especially physics focused on optimizing students' understanding of concepts. Based on the needs analysis questionnaire, understanding concepts in physics subjects is relatively low at SMA Negeri 10 Medan because most students have difficulty understanding physics concepts and have difficulty learning physics

material from existing books. In addition, learning is often teacher-centered so that students seem passive when learning. For this reason, an optimization of concept understanding is needed.

According to Kamus Besar Bahasa Indonesia (2012), optimization means a way, process, and act of optimizing (being the best, highest, and so on) to be more/fully perfect or more efficient and optimization refers to the process of increasing the achievement of a desired goal according to predetermined standard. One of the physics materials that requires an understanding of the concept is harmonious motion. Simple harmonious motion material is a concept whose application is found in everyday life.

According to Suranti et al. (2016) the importance of understanding a concept lies in the ability to communicate and categorize ideas, ideas or events experienced by a person in everyday life. Students who understand concepts will process things related to procedural knowledge faster than students who only memorize and remember (Nisrina et al, 2016). Therefore, it is necessary to design an educational package that is accompanied by a learning model so that it can optimize students' understanding of concepts effectively and efficiently.

Several research results that are relevant to the research theme related to optimizing concept understanding include Setiono et al. (2017) research entitled "Optimalisasi Penguasaan Konsep, Kemampuan Berinkuiri Dan Sikap Ilmiah Mahasiswa Melalui Modul Berbasis Inkuiri" showing that the module has met the feasibility in terms of presentation components, language and content and based on the results of the pretest and posttest, n-gain was obtained with a moderate category so that it was considered effective in increasing students' mastery of concepts. In addition, Yusdarina and Basri's (2020) research shows that the application of a contextual approach assisted by learning media can increase students' interest in learning and understanding of physics concepts.

Research by Mulyana et al. (2021) with data obtained based on 20 journals related to the effect of physics and science teaching materials on students' conceptual understanding shows that the effect of teaching materials in science and

physics learning on conceptual understanding based on education level is most effective in high school with a high category and the most effective types of teaching materials are modules with a high category. Therefore, it is necessary to design an educational package that is accompanied by a learning model so that it can optimize students' understanding of the concept of effective and efficient.

The preparation of physics teaching materials and their implementation must be directed to provide opportunities for students to achieve increased understanding. Although the available ICT-based learning support facilities are sufficient, in terms of implementation it is still not optimal because learning resources such as print-based teaching materials are very limited.

To deepen students' understanding, the researcher will create an e-module with the most appropriate approach, namely the contextual approach. Contextual learning is a concept that helps educators connect material with actual situations so that it can encourage students to connect their knowledge with applications in everyday life (Komalasari, 2017).

Clarke & Roche (2017) obtained research that through a contextual approach can help students in connecting between theory and its application to real life so that it can improve their reasoning. Research of Sarumaha's (2018) shows that there is an effect of contextual learning on students' conceptual understanding as evidenced by the pretest and posttest scores. Researchers also suggest using a contextual approach as an alternative in optimizing students' conceptual understanding abilities.

Other researchers have also succeeded in obtaining success in making e-modules based on contextual, such as research conducted by Dewi and Primayana (2019) obtained the results that students' understanding of concepts using the CTL module facility was higher than classes with direct learning. Bukit et al. (2013) obtained the results of learning innovations by optimizing the use of effective CTL-based learning resources and quite providing a significant impact on general physics learning outcomes I using pretest and posttest in measuring students' level of understanding of the subject matter. In addition, there is success in increasing

understanding of the material based on the value of n-gain, proper validation results and high teacher and student reactions indicating that e-modules are suitable for use in education based on research by Ngadimin et al. (2021).

Based on the research described above regarding the success of e-modules using a contextual approach, this research is expected to be a suitable answer to current problems so it is very important to do CTL learning using e-modules. In addition, students can also be wiser in using smartphones, understand concepts and can use these concepts in their lives.

This is what underlies researchers interested in raising and discussing this issue in a study on "The Generate of E-Modules Based Contextual on Harmonious Motion Materials to Optimize the Understanding of Concept in SMA Negeri 10 Medan".

1.2. Scope

Based on the background that has been stated above, the scope of the problem in this research is the generate of e-modules based contextual on the subject of harmonious movement to optimize the understanding of concepts in class X of even semesters at SMA Negeri 10 Medan.

1.3 Problem Formulation

Based on the background of the problem that has been outlined, the researcher can put forward the following problem formulation:

1. How is the validation of e-modules based contextual on harmonious motion materials to optimize concept understanding?
2. How is the practicality of e-modules based contextual on harmonious motion materials to optimize concept understanding?
3. How is the effectiveness of e-modules based contextual on harmonious motion materials to optimize the understanding of concepts?
4. Are the understanding of students' concepts that using e-module based on contextual is optimize than student using book in the school?

1.4. Problem Limitations

So that the focus of the research does not deviate from the goal, then the limits of the problems in this study are as follows:

1. Research conducted in high school that implements the 2013 revision curriculum with students of class X MIA even semester as the subject of research and the material is limited to harmonious motion materials.
2. This research focused on generating e-modules based contextual on harmonious motion materials to optimize the understanding of concepts used as a pdf flip-shaped learning resource.
3. Product testing only includes responses to educators and learners.

1.5 Research Objectives

The purpose of this study includes:

1. Knowing the validity of e-modules based contextual on harmonious motion materials to optimize the understanding of students' concepts.
2. Knowing the practicality e-modules based on contextual on harmonious motion materials to optimize students' understanding of concepts.
3. Knowing the effectiveness of e-modules based on contextual on harmonious motion materials to optimize the understanding of students' concepts.
4. Knowing the understanding of students' concepts that using e-module based on contextual is optimize than student using book in the school.

1.6 Research Benefits

The benefits of this study are:

1.6.1 Theoretical Benefits

Improve scientific insights in creating e-modules based contextual on harmonious motion materials to optimize understanding of concepts and as a new innovation in the development of android-based learning media.

1.6.2. Practical Benefits

1. For Researchers

Add to the researcher's insight into the right teaching materials to use and train skills as a prospective educator in making teaching materials or media innovations.

2. For Educators

As a consideration and alternative for educators to use contextually based e-modules on harmonious motion materials to optimize understanding of concepts.

3. For Learners

Facilitate the learning process, improve learning outcomes, optimize the understanding of concepts, and learn resources of learners in harmonious motion materials.

1.7 Operational Definition

To avoid misunderstandings in this writing, the author gave several explanations of the term, including the following:

1. E-module is a form of presentation of self-teaching materials that are arranged systematically in certain learning units presented electronically, where each learning activity is a navigation that makes students with its presentation into a more interactive program with video tutorials, animations and audio (Kementrian Pendidikan dan Kebudayaan, 2017).
2. Contextual approach is an approach that emphasizes students' full participation in finding the material learned and associating it with the actual situation (Ratumanan, 2015).
3. Concept understanding is the effort that students must make to record and retransmit information from a particular topic so that it can be used on problem solving, analyzing, and interpreting certain events (Silaban, 2014).
4. E-module based contextual to optimize concept understanding is an electronic teaching material that contains material, boundaries, methods, and evaluations that are designed in an attractive and systematic way using

the concept of learning as an effort to increase students' cognitive abilities by linking learning materials to encourage students to connect their knowledge with applications in everyday life with the aim that students can have an understanding of concepts that are accepted and in accordance with the actual scientific form in order to achieve the maximum goal.

