

CHAPTER I INTRODUCTION

1.1. Background

In the era of globalization, human life is influenced by development of science and technology. There are many problems that arise in everyday life, scientific information is needed to solve them. Science in the general sense is knowledge related systematically to the structure of natural phenomena (Putra, 2016). The process in science has the meaning of scientific activity which has the function of describing natural phenomena so that scientific products are obtained in the form of facts, principles, laws and theories. Based on this, it can be concluded that science as a basic science has a very important role in supporting science and technology (Nurjannati, 2017). The drastic progress of science requires teachers as educators to work hard to adapt to all aspects of life. This is in accordance with the development of the education curriculum in Indonesia which always adapts to the times.

Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System Article 1 paragraph 19 states that curriculum is a set of plans and arrangements regarding objectives, content, additional lessons and methods used as guidelines for organizing learning activities to achieve certain educational goals. According to Masykur (2019) the curriculum is a number of student experiences that are planned, directed, implemented and accounted for by the school or teacher. The curriculum applied in Indonesia continues to be developed so that the quality of education is getting better. At this time the Government of Indonesia implements the 2013 curriculum as an educational curriculum.

Based on the results of interviews with physics subject teachers, that SMA Negeri 15 Medan has implemented the 2013 curriculum in learning. The 2013 curriculum that is currently implemented changes the learning pattern which was originally teacher centered to become student centered, where the activeness of

students is highly prioritized while the teacher only acts as a facilitator who helps and guides students in their learning activities. Students are trained to be able to find and learn concepts independently, and connect the concepts they learn with everyday life (Herdiansyah, 2018).

Through interviews it was also found that the students' physics subject scores had an average of 65, the results of this average score were classified under the minimum completeness criteria. At that school it is known that in physics subject it has minimum completeness criteria 80. Based on the results of observations through student questionnaires at SMA Negeri 15 Medan, it showed that 72.2% of students stated that physics was difficult. As much as 100% stated that practicum was never carried out during learning. Meanwhile, 91.7% of students had difficulty understanding the material through school textbooks, because the completeness of the material, the explanation techniques, and the format were not very attractive. As many as 94.4% of students need alternative instructional material that can be used to learn material more easily and interestingly. In order for students to achieve these various skills, teachers are required to have the ability to develop innovation in learning and to be able to utilize available media and technology. Innovation that can be developed is to develop instructional materials. Based on interviews with teachers, it is known that the learning process only uses printed books from schools and has not used student worksheets in recent years. Therefore one of the teaching materials that can be developed by the teacher is student worksheets.

Student worksheets are sheets containing tasks that must be done by students (Diknas, 2004). Meanwhile, according to Prastowo (2012) Student worksheets is a printed instructional material in the form of sheets of paper containing material, summaries, and instructions for carrying out learning tasks that must be done by students, which refers to the basic competencies that must be achieved. From the explanation above, it can be understood that student worksheets is a guide used by students to carry out investigative activities or problem solving in the learning process. The types of student worksheets forms are concept discovery worksheets, application and integration of concepts, study guides, strengthening, and practical instructions (Prastowo, 2012).

One type of student worksheets used in physics learning is student worksheets in the form of concept discovery. Concept discovery worksheets can encourage students to actively participate in learning because students are led to gain experience and conduct experiments so that it is possible to find concepts and principles independently and make students more skilled. Student worksheets presentation can be innovated by integrating student worksheets with learning models (Muslem et al., 2019). This innovation can also be a solution for the teacher to be able to teach with various learning models. This is known after interviewing the teacher, where the teacher always use conventional learning models. Even though previously the teacher had tried to use the cooperative learning model, the teacher felt that the learning situation was increasingly not conducive, so the teacher returned to using the conventional learning model. The right learning model to be combined with student worksheets is a learning model that is able to activate learning independence and student interest through discovery activities, one of the learning models that can activate student learning independence and interest is the discovery learning model.

Discovery learning model is a learning model that is able to train students' ability to solve a problem. This model positions the teacher as a facilitator, where students discover unknown knowledge for themselves through teacher guidance and questions (Mawaddah, 2016). This model also invites students to find the information themselves and then understand its meaning. The main characteristics of discovery learning are exploring and solving problems that are created, combining and generalizing from what is found, student-centered, and combining new knowledge with existing knowledge (Kristin and Rahayu, 2016).

Learning activities using the discovery learning model emphasize direct student experience through investigative activities, discovery of concepts to be applied in everyday life (Nupita, 2013). Student worksheets based on discovery learning can help students to think, analyze, and compile independently the final results of the activities carried out (Noviafitri, et al, 2016). The purpose of discovery learning-based student worksheets is to foster interesting, active, creative and independent learning (Juliyanto and Soejoto, 2017).

In modern era, an effective student worksheets in the learning process is an e-student worksheets. E-student worksheets is an instructional material that is accessed through electronic devices such as cellphones, tablets or computers. The advantage of e-student worksheets is that it can simplify and narrow space and time so that learning becomes more effective. In addition, e-student worksheets can be an interesting tool when students' interest in learning decreases (Syafitri and Tressyalina, 2020). Another advantage of e-student worksheets is that it can provide information in the form of images and videos interactively, thus making students more enthusiastic about learning. E-student worksheets is considered more practical because it can be used anywhere and anytime and presents interesting material, this is reinforced by the current situation where the school allow students to bring and use mobile phones for study purposes..

One of the software that can be used to develop interactive and interesting electronic worksheets is Flip PDF Corporate. Flip PDF Corporate is a suitable software when used by students in the learning process, because in this application there are various features such as motion animation, video, images, and audio that can attract students' interest and make teaching and learning activities not monotonous (Fitri, 2021).

Based on the problems that have been described, the researcher is interested in conducting research with the title” **THE DEVELOPMENT OF E-STUDENT WORKSHEET ASSISTED BY FLIP PDF CORPORATE BASED ON DISCOVERY LEARNING IN SOUND WAVE**”.

1.2. Identification of Problem

Based on the description of the background above, several problems can be identified as follows:

1. Students do not use student worksheets in physics subjects and only use textbook provided by the school.
2. The teaching materials used by students have not been able to understand the concepts of physics.
3. Teacher still use the konvensional model in the learning process so that students get bored easily.

4. The average student learning outcomes are below the Minimum Completeness Criteria.

1.3. Scope of Problem

So that the research does not deviate from the research objectives, the problem is limited, including:

1. The material discussed in the e-student worksheet is the material of sound wave in class XI.
2. The subjects studied were students of class XI IPA 3 at SMA Negeri 15 Medan for the 2022/2023 academic year.
3. The developed e-student worksheet will be validated by material experts, media experts, physics teacher response and student responses.
4. The e-student worksheet development uses the 4-D development concept, namely define, design, development, and disseminate.

1.4. Formulation of Problem

Based on the background, the formulation of the problems in this study are:

1. How is the validity level of e-student worksheet assisted by Flip PDF Corporate based on discovery learning in sound wave materials ?
2. How is the response of teacher and students to e-student worksheet assisted by Flip PDF Corporate based on discovery learning in sound wave?
3. How is the effectiveness of e-student worksheet assisted by Flip PDF Corporate based on discovery learning in sound wave material on student learning outcomes?

1.5. Research Objectives

The objectives of this research are as follows:

1. To find out how the validity level of e-student worksheet assisted by Flip PDF Corporate based on discovery learning in sound wave materials.
2. To find out the response of teacher and students to e-student worksheet assisted by Flip PDF Corporate based on discovery learning in sound wave.

3. To find out how the effectiveness of e-student worksheet assisted by Flip PDF Corporate based on discovery learning in sound wave material on student learning outcomes.

1.6. Benefits of Research

The expected benefits of the research are as follows:

1. For students, the development of e-student worksheets based on discovery learning can be one of the instructional media for solving problems with limited understanding of concepts in sound wave material.
2. For teachers, increasing the variety of instructional media is a consideration for using e-student worksheets based on discovery learning as a support for learning to increase student interest in participating in learning.
3. For researchers, provide real knowledge and experience about developing e-student worksheets based on discovery learning in sound wave material to train students' understanding of concepts.
4. For readers, as reference material for further research and as material for improvement in the world of education.

1.7. Operational Definition

1. E-student worksheet based on discovery learning is a digital task sheet that must be done by students which in its development is adapted to the learning steps in the discovery learning model.
2. E-student worksheet assisted by Flip PDF Corporate based on discovery learning is an electronic worksheet in the form of an interactive flipbook and contains video features arranged according to the learning steps in the discovery learning model.