CHAPTER I

INTRODUCTION

1.1 Background

Education takes an important part in shaping the personality and abilities of a nation. Education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to develop spiritual strength, self-control, personality, and skills (Fajariyah, et al., 2016).

According to Law No. 20 of 2003, education is a planned effort to create an atmosphere and learning process. The purpose of education is for students to actively develop their potential. Education can shape the self-discipline of everyone, unyielding, respect for others, creative, and able to look at the world openly.

Education is divided into three, formal education, informal education, and non-formal education. First, formal education is a type of education that is given from elementary school to college. Second, informal education is a type of education provided from the family and community environment. Third, non-formal education is a type of education that is organized in a structured manner but not in formal educational forums. In accordance with Government Regulation No. 47 of 2008, compulsory education for children is 12 years. This is because, at that age vulnerable children can develop what is in him.

The education system in Indonesia follows the National Education System which will bring progress and development to the nation. Currently the world continues to develop, so the education system needs to adjust the development of the times that continue to grow. For this reason, the education system is required to use and be able to process educational resources efficiently and effectively (Munirah, 2015).

Education reform is an attempt to adapt an education system that can meet the demands of the world. Through these reforms, education must provide guarantees for the realization of human rights to develop all its potential as an effort to improve the welfare of life in the future.

Currently, efforts to improve the quality of education face obstacles, where currently the final evaluation of national learning is no longer determined by the UN but is completely determined by the school. Data obtained from UNESCO states that the quality of educators is an important component in education (Arifa & Prayitno, 2019).

The main task of educators is to condition the environment to support changes in student behavior. Chemical learning emphasizes on providing hands-on learning experiences through the development of process skills and scientific attitudes. Chemical learning can be carried out when the interaction of educators-teachers is interesting (Yektyastuti & Ikhsan, 2016).

The use of learning media can help educator's limitations in delivering lessons in the classroom. Media serves as a tool to convey information on learning materials and practice questions. The quality of learning is also influenced by differences in student characteristics (Yektyastuti & Ikhsan, 2016).

Learning media has a role in improving the quality of learning, the presence of learning media not only helps teachers in conveying materials, but also provides added value in the learning process. The use of learning media in the teaching and learning process can arouse student's learning motivation and increase stimulation of student learning activities.

The creative use of media can facilitate and increase learning efficiency so that learning goals can be achieved. The achievement of learning goals can be influenced by teachers in choosing learning media that is in accordance with the learning material and in accordance with the characteristics of students.

Understanding chemistry is determined by one's ability to relate macroscopic, submicroscopic, and symbolic phenomena. A person has some level of competence to represent macroscopic phenomena. There are five levels of competence of a person in representing this phenomenon (Johnstone, 1993).

Most chemicals can be understood by conducting experiments, but materials that are theoretical and abstract are difficult for students to understand if they rely solely on information from teachers. Haloalkanes are materials that not only require memorization, but haloalkanes also require understanding of concepts. This makes haloalkanes one of the theoretical and abstract chemicals for SMA/MA. Students

who scored well on the exam had difficulty understanding chemistry due to their inability to visualize haloalkane matter at the sub-microscopic level and their inability to relate to other levels of chemical representation.

Based on the results of observations that have been made by researchers at the MAN 2 Model Medan school using the interview method. The data obtained is the process of learning haloalkane materials in this school using PowerPoint media and Problem Based Learning models. Doing learning using this medium gets a response from students, that it is difficult to understand abstract chemistry. So it is necessary to find a replacement for learning media. It is intended that students give a positive response by improving learning outcomes. The selection of replacement media must be in accordance with the learning model to be used.

For this reason, learning media is needed that can help concrete abstract things, clarify message delivery, improve student's understanding, encourage active students, and self-study. The learning media used can be adapted to the environment where students live, making it easier to understand and encouraging student's to learn.

The proper and varied use of chemical learning media can overcome student's passive attitudes, and student's motivation will grow rapidly. Thus, the student's learning outcomes will be more embedded in the student if students get fun learning by using creative and innovative learning media. Student's difficulty in understanding abstract chemistry. So, it takes the right strategy, media, and learning model to present chemicals to students. Teachers as educators have a considerable role in choosing and using the right methods by paying attention to the student situation and the supportive learning environment, so that student learning outcomes will improve (Ramlah, 2018).

Based on this description, the researcher wanted to conduct a study entitled **"Influence of Macromedia Flash Based on Computer Animation Media to Improve Student Learning Outcomes in Haloalkanes Sub-Subject".**

1.2 Identify the Problem

Based on the background of the problem above, the identification of the problem can be formulated as follows:

1. The learning media used in the teaching-learning process has not been able to cultivate student's interest and motivation to study chemicals.
2. Technology that continues to evolve as the times progress
3. Difficulty understanding chemicals that are abstract and complicated
4. Learning resources are still limited only from the explanation of educators

1.3 Problem Limitations

Based on the identification of the above problems, the problem limitations of this study are as follows:

1. The learning model that will be used in this study is Think Pair Share (TPS) using macromedia flash based on computer animation media.
2. The material that will be taught in this study is Haloalkane material.
3. Computer animation media-based macromedia flash media

1.4 Problem Formulation

Based on the limitations of the above problems, the problem formulation of this study is as follows:

1. How does the influence of macromedia flash based on computer animation media on student learning outcomes in the haloalkane sub-subject?
2. Is there a correlation between the responses students give about macromedia flash based on computer animation media with student learning outcomes in the haloalkane sub-subject?

1.5 Research Objectives

Based on the formulation of the above problem, the purpose of this study is as follows:

1. To find out the influence of macromedia flash based on computer animation media on student learning outcomes in the haloalkane sub-subject.
2. To find out the correlation between the response given by students to macromedia flash based on computer animation media with student learning outcomes in the haloalkane sub-subject.

1.6 Benefits of Research

The expected benefits of the results of this study from several aspects are:

1. Theoretical Benefits

In general, from this research, it is expected that students have the desire to develop macromedia flash learning media based on computer animation media in the future.

2. Practical Benefits

a. For Students

As a forum to increase knowledge and assist students in carrying out the learning process on haloalkane materials.

b. For teachers

As a consideration for educators in using macromedia flash learning media based on computer animation on haloalkane materials that are expected to be a reference for educators to always use learning media in carrying out the learning process.

c. For School

The results of this study are expected to be an input in efforts to improve the quality of education and improve student learning achievements related to the use of macromedia flash learning media based on computer animation in haloalkane materials.

d. For Next Researcher

The results of this study are expected to be used as consideration and reference for relevant research.

1.7 Operational Definition

To provide a more targeted understanding of the subject matter in this study, the researcher first explained some of the terms contained in this study so as not to

provide a more targeted understanding of the subject matter in this study, the researcher first explained some of the terms contained in this study so as not to occur misunderstandings. The terms that need to be explained in this study are:

a. Think Pair Share Learning Model

Think Pair Share (TPS) is a learning model that provides opportunities for each student to actively participate with other students. The learning model in the past provided only one student to participate and share their understanding with other students in the class. This Think Pair Share (TPS) model gives at least eight times as many students to be recognized and participate in class. McTighe & Lyman (1988) argue that this model is an effective solution in creating a pathway for class discussion. This model can provide opportunities for students to think, respond, and interact, if this model is managed properly.

The Think Pair Share (TPS) learning model aims to teach students to be more independent to complete tasks in groups. The knowledge obtained by students with their own thoughts will make it easier for students to understand learning. The Think Pair Share learning model will make students more active during the learning process. In addition, by using this Think Pair Share learning model, students will be required to cooperate, accept different opinions, and will help each other in solving a problem (Rahmawati et al., 2016).

b. Learning Media

Learning media is a means used during the learning process as a support for the material to be delivered. Media is used to attract student's interest in following the learning process. So that the realization of effective and efficient learning (Affandi et al., 2013).

The advantages of using interactive multimedia in lessons include:
a. The learning system is more innovative and interactive.
b. Educators will always be required to be creative in innovating in search of learning breakthroughs.
c. Able to combine text, images, audio, music, animated images or videos in a single unit that supports each other in order to achieve learning objectives.

d. Increase student motivation during the teaching and learning process until the desired learning objectives are obtained.

e. Able to visualize material that has been difficult to obtain, explained only with conventional explanations or teaching aids.

f. Train students to be more independent in gaining knowledge

c. NWChem

NWChem is a NorthWest Chemistry modeling software known as computational chemistry that has been designed and developed to work efficiently. NWChem has a five-level modular architecture:

1. Generic Task Interface

This interface is also known as an abstract programming interface that serves as a mechanism for transferring control to different modules from the second NWChem level.

2. Molecular Calculation Module

A molecular calculation module is a programming module that can complete computational tasks, performing specific operations using a theory that has been determined by the user when inputting files. NWChem's independent module shares data only through disk-resident databases.

3. Molecular Modeling Tools

It provides basic chemical functions such as symmetry, base set, grid, geometry, and integrals.

4. Software Development Toolkit is the foundation of code.

5. Utility Function

A utility function is a function needed by almost all modules in the code. This includes functionality such as input processing, output processing, and timing (Apra et al., 2020)

d. Computational Chemistry

Computational chemistry is a branch of chemistry that uses the results of chemical theory to be translated into computer programs through computer simulations to determine the nature of molecules and their changes. Chemical research with a computer starts from the stage of reviewing the chemical structure with the physiology of the compound to be tested. Computational chemistry will solve problems that cannot be solved simply by conducting experiments (Pranowo & Hetadi, 2011).

e. Animation

Animation is the process of creating a shape change effect that occurs during a predetermined time. Animation is widely used as a learning medium. Animation can be interpreted as a change in the visual arrangement of graphics that stimulates a continuously modified display (Schnotz & Lowe, 2008). The usefulness of animation depends on the purpose of creating the animation itself. In a technological environment, animation is used to make students understand difficult practices (Ainsworth & Van Labeke, 2004). The use of animation is a very promising option. This is because in its use animation will be easily remembered by students because it has a color, size, sound that is easy to remember.

Animation refers to computerized simulation using images to form a synthetic film. This process stitches together the still images in a sequence so that they will appear one after the other by creating the illusion of motion. One can feel or see the pictures moving. Animation is an important component for designing interactive multimedia that creates visual interest and makes scientific learning more interesting and enjoyable for students. Visual animation explains visual and spatial information when these two components are used effectively (Zahra, 2016).

f. Macromedia Flash

Macromedia flash media is a medium used to create interactive learning media with a wide variety of animations, sounds, videos, and others. In the learning process macromedia flash is used as a presentation media in the form of interactive multimedia. Macromedia flash can be used to create interactive animations, where

visitors can enter data, then Flash evaluates and displays the results. Macromedia flash can create a more concrete way of thinking students that will increase understanding of the material taught (Badlisyah & Maghfirah, 2017).

Presentation of material using macromedia flash is easy to understand and understand because it can visualize simulations and animations so that the images look like life. Communicative and interesting presentation of lessons is one way to attract interest and motivate students to digest the lessons delivered (Gustina et all., 2016).

The use of macromedia flash-based multimedia in the learning process is still very minimal, even though school facilities and facilities support it. This condition is due to the ability of teachers in making multimedia is still not optimal (Muwaffaq, 2017).

g. Learning Outcomes

Learning outcomes are specific skills, knowledge, and attitudes that a learner will achieve after completing a particular lesson. In addition, learning outcomes also describe what is expected to students after succeeding in a learning. So, it can be said that learning outcomes are knowledge, skills, and abilities that students have achieved because of their involvement in a series of learning experiences that they have completed.

h. Student Response

A response is the result of a behavioral stimulus, i.e., the activity of the person concerned, regardless of whether the stimulus can be identified or not. Student's response to learning media can be both a positive response and a negative response. Positive student response can be used as a benchmark that students feel more comfortable with the learning media used in the learning process.

Student's interest in the media can be used as a teacher as a benchmark for success in the learning process. Student's attention will be focused on the learning process if students are interested in the media used. So that students will play an active role and give a positive response (Nugraha et al., 2013)