

CHAPTER I

INTRODUCTION

1.1 Background

Education in life has a very important role in determining the success and progress of a country and nation. In achieving a quality education, an effort is needed that should pay attention to everything related to education itself. Education can be interpreted as a means of inheriting life because a skill acquired in the past and present can be preserved and developed for future generations.

Mathematics is a complex and difficult subject. This is because mathematics has an abstract nature or because learning is less related to the realities that students usually encounter in everyday life. According to Erman (2015) Mathematics is the science of logic regarding shapes, arrangements, quantities and other related concepts in large numbers divided into three types of fields, namely: algebra, analysis, and geometry. Mathematics needs to be studied and mastered a certain extent by all Indonesian citizens, both in its application and in its mindset. Mathematics lessons for many students become a burden during their school years, even though mathematics is a basic science from the basic education level to the higher education level.

Mathematics is one of the sciences that is taught at every level of education. Being taught mathematics certainly has its own goals for the world of education and for the students themselves. The goals of learning mathematics in Indonesia are contained in content standards in which students have the ability to understand mathematical concepts, explain the interrelationships between concepts and apply concepts accurately, efficiently and appropriately. Mathematics is one of the main fields of science in the world of education which is very important, both for students and the development of other fields of science as well as in community life. That there are still many students who have difficulty learning mathematics. With teaching and learning activities always dominated by certain students, while other students are not active. Student interest in mathematics is still low. Students

consider mathematics to be a difficult and uninteresting subject. In fact, it is not uncommon during the teaching and learning process that students often do assignments outside of mathematics. Mathematics is basically a structured knowledge, developing an attitude of critical, objective and open thinking becomes very important for students to have in dealing with the development of science and technology. Mathematics has an important role as a communication tool that is needed both by all sciences and in everyday life. In the process of learning mathematics in the classroom, teachers are required to provide opportunities for students to communicate their ideas or ideas in order to build self-confidence, discipline, and students' responsibility in communicating. Teachers as facilitators in developing students' abilities need to carry out innovative learning. In addition, teachers should be able to develop problem-solving skills and critical thinking skills so that they are able to relate the means of all mathematical concepts in solving problems in each lesson. If there is a communication process between teachers and students as well as between fellow students mathematics communication is one of the objectives of learning mathematics and is one of the competency standards for school graduates from elementary to secondary education. Through learning mathematics students are expected to be able to communicate ideas with symbols, tables, diagrams or other media to clarify situations or problems. (Trianto. 2016)

Mathematical communication can be interpreted as an event of dialogue or mutual relationship that occurs in a classroom environment, where message transfers occur, and messages are transferred containing mathematical material that students learn, for example in the form of concepts, formulas or problem solving strategies. The parties seen in the communication events in the classroom environment are teachers and students. The method of transferring the message can be oral or written. In the learning process, there will always be an interconnected event or communication between the message giver (teacher) who has a number of elements and messages to be conveyed and how to convey messages to students as message recipients. Mathematical communication is a way for students to express and interpret mathematical ideas orally and in writing, either in the form of pictures, tables, diagrams, formulas or demonstrations.

Mathematical communication ability need to be mastered by students. Students' mathematical communication ability really need to be improved because through mathematical communication students can organize their thinking both orally and in writing. Students can respond appropriately either among the students themselves or students and teachers during the learning process. Students who have good communication ability tend to be able to make various representations so that it makes it easier for students to get alternatives for solving various mathematical problems. This mathematical communication ability is also a requirement for solving problems, meaning that if a student cannot communicate well about understanding problems and mathematical concepts, then he cannot solve the problem properly. Therefore this mathematical communication ability is important in learning mathematics. (Aminah. 2018)

The low students' mathematical communication ability resulted in most students experiencing learning such as (1) students were less daring in asking questions, (2) students were less courageous in expressing opinions/ideas, (3) students were less able to summarize/conclude material that had been studied and (4)) students lack courage in presenting or presenting their work. The conclusion that can be drawn is when students are lacking in communication, students will experience difficulties in learning mathematics, because these students do not have the courage, lack in conclusions and are embarrassed when showing the results of their work to others, and will result in students having difficulty solving problems. for not communicating properly. In the learning process, students' mathematical communication ability are very important to improve because mathematics requires students not only to think but also to communicate. Students' mathematical communication ability support student success in almost every study. Therefore, in learning mathematics, there needs to be interaction so that students' mathematical communication ability need to be possessed by students. Meanwhile, outside of mathematics lessons, students' mathematical communication ability are still important for students to have as a tool for interacting with others. Communication between one another can build a better life and without communication it will not be possible for an exchange of mindsets from each individual in society. Therefore students are expected to be

able to communicate well so that they can interact properly, both at school and in society (Purnamasari, 2021)

In the context of student-centered mathematics learning, the message giver is not limited to the teacher alone, but can be done by students and teachers alone, but can be done by students and other media, while the elements and messages in question are mathematical concepts, and how to convey messages can do both orally and in writing. Communication ability are important when discussions between students are held, where students are expected to be able to state, explain, describe, listen, ask, and work together so that they can lead students to a deep understanding of mathematics. In this case, communication is seen as the student's ability to communicate the mathematics that is learned as the message content that must be conveyed. With students communicating their knowledge, there can be a renegotiation of responses between students, and the role of the teacher is expected to only be a filter in learning (Hodiyanto, 2017)

Meanwhile, in NCTM (2000) it is stated that mathematical communication standards are the emphasis of teaching mathematics on students' abilities in terms of:

- a. Organizing and consolidating their mathematical thinking through communication
- b. Communicate their mathematical thinking coherently (logically arranged) and clearly to their friends, teachers and others
- c. Analyze and evaluate the mathematical thinking (mathematical thinking) and the strategies used by others
- d. Using mathematical language to express mathematical ideas correctly

They argue that without communication in mathematics, we will have little information, data, and facts about students' understanding of the processes and applications of mathematics. This means, communication in mathematics helps teachers understand the students' ability to interpret and express their understanding of the mathematical concepts and processes they are learning.

Thus, Baroody suggested that encouraging children to express their ideas is the best way for them to find gaps, inconsistencies, or ambiguities in their thinking (in Lim and Chew 2015). This implies the importance of ensuring students' proficiency in a language so that they are able to communicate and learn well using the language.

Mathematical communication ability are important, but ironically learning mathematics has not paid much attention to the development of this ability, so that the mastery of this competency for students is still low. The results of research conducted by Handayani (2018), Fitriza (2017) show that mathematical communication skills are still low in learning mathematics. When students ask a question, their reaction is generally to look down or look at the friend sitting next to them. They lack the confidence to communicate their ideas for fear of making mistakes and being laughed at by friends (Hodiyanto. 2017)

The use of interactive learning multimedia is a systematic use. The domain of multimedia utilization is very important because it relates to student interaction with learning materials. In addition, the use of multimedia learning is also related to activities using processes and resources for learning, preparing students to be able to interact with selected learning materials and activities, providing guidance during learning activities and providing an assessment of student learning outcomes. The use of multimedia as a learning resource can create an effective and interesting learning atmosphere. Learning multimedia is a tool as well as a strategy used by teachers and students to achieve predetermined learning competencies. (stephanus, 2018)

One of the efforts that can be made to overcome this situation is to use the help of learning media because so far the use of media is still lacking. The use of learning media is one effort that can be made to help students understand concepts in mathematics (Sufri 2019). Media-based teaching as an innovation in mathematics learning models. Has experienced development and is widely used in the teaching process. The learning media have played it as a learning resource, so that it is possible to carry out the learning process independently by the target students with the help of a minimum of other people. This role can practically

occur because the media as a learning aid has the ability to, (1) make abstract concepts concrete, (2) transcend senses, time and space (3) produce uniformity of observations, (4) provide uniformity of user control direction and speed of learning, (5) arousing learning curiosity and, (6) providing a whole learning experience from abstract to concrete.

The use of computers as a learning aid has experienced a shift in the world of education. The use of computer programs in mathematics learning is very beneficial because it can provide broad opportunities for students and teachers to develop their abilities in investigation and analysis, as well as forming new knowledge and understanding in seeing lessons using computer programs in simple data collection, visualization, analysis and complex. (Miftahul. 2019)

The multimedia learning process is ICT. ICT is a technology system that can reduce space and time constraints for retrieving, moving, analyzing, presenting, storing and delivering data into information. A more general definition of the term leads to the development of technology, computers and telecommunications / multimedia (in various forms) which already have various abilities such as data or information processing, control devices, communication tools, educational media, entertainment and others. Technology is the key domain of ICT and IT. It is clear that information technology cannot be separated from computer and telecommunications technology. Thus, one of the alternatives in learning media is to use multimedia based on Macromedia flash.

and (2020), matter, innovative,, formatmatics. and (2020), matter, innovation, and formathematics. Learning media that can be used to support the learning of macromedia flash applications, audio-visual learning media that can influence students' activeness and mathematical abilities. In line with Yusuf (2020) who suggests that teachers in learning use learning media that are appropriate to subjects such as student activity sheets that are varied, innovative and interactive through programs such as Visual Basic and Macromedia Flash. This macromedia flash software is proven to have important benefits in learning mathematics.. Macromedia Flash is software that is capable of presenting clear audio-visual messages to students and real material, so that it can be illustrated

more attractively to students with various animated images that can stimulate students' interest in learning to achieve learning goals. Macromedia flash is an effective learning media. The use of macromedia flash in the teaching and learning process can clarify the learning material conveyed by the teacher, because macromedia flash displays simulations and demonstrations that can make it easier for students to understand learning material so that students can grasp material concepts properly and correctly and can be applied in everyday life. In addition, macromedia flash is a fun learning medium so that it can increase student learning creativity. The use of macromedia flash media in learning because macromedia flash is a learning animation software that is more interesting and easier for students to understand and its application to computers and imager projectors. Macromedia flash media is in line with the growth of education, namely it can contribute to students to foster enthusiasm in the form of the learning process and can focus students' attention and deeper understanding of the material in a fun and more memorable way so as to increase interest in learning.

Macromedia flash program is an application used to design and build presentation tools, publications, or other applications that require the availability of a means of interaction with its users. Can also be used in the learning process because this software contains interesting and interactive animations. This device is built with flash which consists of images, text, simple animations, videos, and other special effects. This application is able to create interesting and interactive animations so that learning activities become more fun and not boring. The use of Macromedia flash is very helpful in Mathematics learning activities with animations and pictures that will make it easier for students to remember Mathematical symbols and so that they are easily understood by students. Therefore, Macromedia flash can be said to be able to improve students' mathematical communication skills. Mustamid & Raharjo (2015)

In general, learning media can be interpreted as media used in the learning process, messages in the form of knowledge, skills and attitudes can be channeled with learning media, and can stimulate the attention and willingness of students to achieve learning goals. A media that is used to convey a material will be really

needed when students experience difficulties in the learning process. Educators will also find it easier to convey material if an educator uses media that suits their needs.

Encyclopedia of Educational Research details the benefits of learning media as follows:

- a. Laying concrete foundations for thinking, thereby reducing verbalism.
- b. Increase the attention of students
- c. Laying the foundations that are important for the development of learning, therefore making lessons more solid
- d. Providing real experiences that can foster self-employed activities among students
- e. Fostering orderly thinking especially through moving pictures
- f. Helping the growth of understanding that can help the development of language skills

Media that contains material that is explained so that students can very easily if they want to repeat learning and do it independently, and students can learn easily and it is hoped that students will be more active in learning and able to understand the material. Subject matter well, including solving problems in the form of mathematical concepts. And besides that, it can fix problems in the form of mathematical concepts. In addition, it can increase students' interest in learning mathematics, So as to create teaching and learning activities that are efficient, effective and fun because so far the students have been less active in the learning process. Learning using Macromedia Flash multimedia can provide opportunities for students to learn more focused and easier to understand. Multimedia learning can be a substitute for books that are easy to carry anywhere for studying. (Rudy, 2017)

Based on the description above, researchers are interested in conducting research with the title " THE EFFECT OF USING MULTIMEDIA MACROMEDIA FLASH ON STUDENT MATHEMATICS COMMUNICATION AT SMP NEGERI 1 LABUHAN DELI "

Because research on the effect of using multimedia Macromedia flash has never been used to measure students' mathematical communication, the researchers are interested in conducting this research.

1.2 Identification of problems

Problem identification based on the background of the problem above is:

1. Students are less active in the learning process
2. Students' interest in mathematics is still low. Students consider mathematics to be a difficult and uninteresting subject.
3. Mathematics learning is still teacher-oriented
4. Mathematical communication ability in learning mathematics are still low
5. The lack of use of media in teaching and learning activities

1.3 Limitation of problem

Based on the background and problem identification, it is necessary to define the problem so that it is more focused. The limitation of the problem with this study is the effect of using Macromedia flash on students' mathematical communication ability.

1.4 Formulation of the problem

To provide directions that can be used as a reference in research, a problem formulation is made

1. How are the students' mathematical communication ability using MACROMEDIA FLASH?
2. How is the mathematical communication ability of students who learn without using MACROMEDIA FLASH?
3. Is the mathematical communication ability of students who learn using MACROMEDIA FLASH media better than the mathematical communication ability of students who learn without using MACROMEDIA FLASH media?

1.5 Research purposes

The objectives of this study are:

1. To find out how the mathematical communication ability of students who learn using MACROMEDIA FLASH
2. To find out how the mathematical communication ability of students who learn without using MACROMEDIA FLASH
3. To find out whether the mathematical communication of students who learn using MACROMEDIA FLASH media is better than the mathematical communication of students who learn without using MACROMEDIA FLASH media

1.6 Benefits of Research

This research was conducted with the hope of providing the following benefits:

1. For students, through the use of multimedia based on Macromedia Flash, it is hoped that students can more easily understand the material in mathematics, so as to improve students' mathematical communication.
2. For teachers, it can expand knowledge about the use of multimedia based on Macromedia Flash in helping students to improve students' mathematical communication.
3. For schools, as material for consideration in developing and perfecting mathematics teaching programs in schools.
4. For researchers, as informational material as well as reference material for researchers in carrying out teaching tasks as prospective teaching staff in the future.
5. For readers, as information material for readers or other researchers who wish to conduct similar research.

1.7 Operational Definition

The operational definition of this research is:

1. The effect is the difference in the results of the students' mathematical communication ability tests on the pretest and posttest
2. Mathematical communication is a way for students to convey their mathematical ideas or ideas to solve a given problem
3. Mathematical communication ability is a student's ability to convey his or her mathematical ideas or ideas to solve a given problem. Among others :
 - a.(Writing/explaining aspect) students' ability to explain a problem by providing arguments against mathematical problems and drawing conclusions and providing reasons or proof of solutions.
 - b.(Drawing aspect) students' ability to transform mathematical ideas and mathematical solutions into pictures, graphs and tables or vice versa.
 - c.(Representational aspect) students' ability to express mathematical ideas using symbols or mathematical language in writing and the form of mathematical models.
4. Macromedia Flash is a multimedia, software, and animation platform used for designing, presentation tools, and publications that require availability of use facilities so that learning is not monotonous.