

## CHAPTER I

### INTRODUCTION

#### 1.1 Background of the Study

The coronavirus disease (Covid-19) pandemic or plague has hit more than 200 countries in the world and has brought challenges to educational institutions, especially higher education institutions. Anticipating the spread of the virus, the government has issued various policies, ranging from isolation, social and physical distance to large-scale social restrictions (PSBB). This situation requires peoples to stay at home, worship, study and work at home (Jamaluddin et al., 2020:2). Where possible, traditional courses are being replaced by books and materials taken away from the school. Various e-learning platforms support the interaction between teachers and students, and in some cases, national television programs or social media platforms are used for education (Gonzalez et al., 2020:1). This situation forces educational institutions to make breakthroughs in the learning methods and models that must be selected in order to continue learning. Even if it is done virtual (online), it will be subject to the consequences of all restrictions, including teacher skills that have not yet been fully learned online. And students with limited carrying capacity of existing infrastructure in the place of residence (Hamid et al., 2020: 1-2).

Teachers and educators as important elements in education are required to migrate from face-to-face learning to online learning. Where this causes problems in the world of education. As the results of observations in SMP Negeri 35 Medan, where teachers deliver the online learning through Whatsapp and Google Classroom by giving assignments that must be done by students without giving explanations to students, so that the material is not conveyed properly and there is less interaction between students and teachers. Handayani (2020:17) also stated that during online learning, the delivery of material was not very clear and the monotonous class causes students to feel bored.

Apart from these new problems, previously there have been problems in the world of education, especially in mathematics geometry material. Based on

Trends in International Mathematics and Science Study (TIMSS) in 2011 which said the dimension of Indonesian students' lowest content is geometry. And this condition still exists as emphasized by Fitriani (2018:2) which said geometry becomes one part of the school's mathematical subject that is difficult to learn in Indonesia. The results of student interviews at SMP Negeri 35 Medan also showed that students had difficulty understanding geometry, especially space and shape, because the teacher only provided material from books without using the other media so that students had difficulty in construct these spaces, especially in three dimensional curved surface. This is in line with the research conducted by Kariadinata (in Suganda, 2020:51) that in general students have difficulty in visualizing and constructing geometric spatial shapes. Therefore, it is necessary to design a learning experience to assist students in visualizing and constructing geometric spatial shapes. This is also emphasized by Suganda (2020:51) that learning media are needed to help students understand the material and to visualize the shape of a mathematical space.

Learning media are inseparable things from learning process. This is because the success of the material delivered by the teacher is also effected by the learning media that used (Mustaqim, 2017:47). Along with the development of technology, the development of learning media is also growing rapidly. The combination between education and technology can be an alternative in the world of education. One of the technologies currently developing is Augmented Reality (AR) technology. Augmented Reality is a technology that combines virtual objects into a real three-dimensional environment and displays them in real time, so that the object seems alive and real in front of us (Affandi, 2014:4). Augmented reality technology can overcome the limitations of space, time and senses such as props that are too large and impossible to use in online or face-to-face learning. So that Augmented Reality technology can be used as a complement to existing learning media (Affandi, 2014:4). The reason that Augmented Reality technology can be used as a learning medium is because the use of AR can make learning more interactive and fun (Mustaqim, 2016:9). But until now, people's knowledge about Augmented Reality technology are still very low (Mustaqim, 2017:37).

Based on the results of observations already done, SMP Negeri 35 Medan is trying to improve the quality of learning, especially in the form of learning media that can be used during online learning and so on. One of the things that has been done is to start using smartphones in the learning process, for example Android phone, where smartphones can be a medium for delivering learning material during the online learning process, such as through the Whatsapp and Google Classroom applications. However, this is not optimal, because students are not very interested in the applications used and students feel lazy and bored during online learning. So we need a media development that can help students during the online learning process.

Based on the background above, this study will develop valid learning media using Augmented Reality technology on the Android Platform for geometric materials, especially for three dimensional curved surface. The final objective of this research is to find out how students respond to the learning media that has been developed.

## **1.2 Problem Identification**

Based on the explanation above, below are the list of problems that are identified in this research:

1. Lack of teacher in online learning skills and the limited carrying capacity of existing infrastructure in students domicile
2. The delivery of material was not very clear and the monotonous class causes students to feel bored during the online learning
3. Students have difficulty in visualizing and constructing geometric spatial shapes
4. Needed the learning media to help students understand the material and to visualize the shape of a mathematical space
5. People's knowledge about Augmented Reality technology are still very low
6. Needed the development of a valid Android-based Augmented Reality learning media for three dimensional curved surface

7. The students response to the Android-based Augmented Reality learning media for three dimensional curved surface developed is not yet known.

### **1.3 Scope of Study**

Based on the problem identification above, below are scope of study that will discussed in this research:

1. Needed the development of a valid Android-based Augmented Reality learning media for three dimensional curved surface
2. The students response to the Android-based Augmented Reality learning media for three dimensional curved surface developed is not yet known.

### **1.4 Research Question**

Based on scope of study above, below are the problem in this research:

1. How may researcher develop a valid Android-Based Augmented Reality learning media for three dimensional curved surface?
2. How do students respond to the Android-based Augmented Reality learning media in three dimensional curved surface?

### **1.5 Research Objectives**

The objectives of this research are:

1. To develop a valid Android-Based Augmented Reality learning media for three dimensional curved surface
2. To know the student's responses about Android-Based Augmented Reality learning media for three dimensional curved surface.

### **1.6 Research Benefit**

The research is expected to have a positive impact to all parties involved, namely researcher, mathematics teacher and students. Below are the expected benefit for all parties involved:

1. Reseacher  
For the reseacher, this research may increase the creativity and inovation in developing the learning media
2. Mathematics teacher  
For mathematics teacher, this research may help delivering the material to improve the student's knowledge of three dimensional curved surface

3. Student

For student, this research may help in learning process with the constructivism approachment in three dimensional curved surface

4. The other reseacher

For the other researcher, this research may be the reference fot the similar research and be the motivation to develop the better learning media.

### 1.7 Operational Definition

Operational definition in this research refers to a detailed explanation of terminology used in this research. Defining the terms is intended to reduce the risk of inconsistency and might provide a different understanding for the reader. Below are the definition of the terms used in this research, namely:

1. Learning media is the media are tools, methods, and techniques used to streamline communication and interest between teachers and students in the education and learning process at school
2. Augmented Reality (AR) is a way of viewing the real world (either directly or via a device such as a camera creating a visual of the real world) and “augmenting” that realworld visual with computer-generated input such as still graphics, audio, or videos.
3. Android is a mobile technology platform that provides phone, tablets, and other handheld and mobile device (even netbooks) with the power and portability of the Linux operating system,the reliability and portability of standard high level languages and APIs and a broad ecosystem of useful applications
4. Development of Learning Media is a series of process or activity which is done to produce a learning devices based on existing development theory

5. Valid learning media is the learning media that its material should be based on state of the art knowledge (content validity) and all components consistently linked to each other (construct validity).



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