

## CHAPTER I INTRODUCTION

### 1.1 Background

Chemistry is one of the natural science that plays an important role and a significant influence on the development and technological progress. But on the other side of chemistry can also be categorized into a science that is rich in abstract concepts, the nature of this abstraction is the cause of student difficulties in enjoying to further understand the chemistry lesson (Muchtar, 2004).

As we know, education is one of important sector in the building of our country, it can be as a invest for a human in a long term. Beside that, education is also one of the effort to develop potencies that have by all students through learning process. That's why the learning process should be able to make the students competency for future of the students, due to the knowledge can be implemented as long the student's life.

Teacher is the special one increasing the quality of education. As the main subject in the front line in learning process, so the education and guidance that is given by teacher to the student be who determines in carrying the successful of education (Huda, 2012).

The objective of chemical subjects based on the standard content of chemistry subjects SMA / MA (Permendiknas RI Nomor 22, 2006) is that students have the ability to understand the concepts, principles, laws, and theories of chemistry as well as interconnection and its application to solve problems in daily life and technology. In fact, students often have difficulty in studying chemistry. The difficulties faced by students in studying chemistry are due to abstract concepts in chemistry.

Bunce (2009) states that to be successful in chemistry requires a good understanding not by memorizing. To facilitate the study of chemistry that contains abstract and microscopic concepts, it can be utilized an ICT based learning media. As the times progressed, all the fields in all aspects of life came to flourish, including the field of education. Progress in education, especially in

science and technology, has an impact on the learning process in schools. The learning process initially takes place in one direction and is centered on the teacher (teacher centered), such as the behaviorist concept, where the educator (learning resource) provides and pours as much information to the learners. Learning process that takes place like that causes learners cannot develop their creativity and thinking patterns. Therefore, the concept of learning is approached by using a constructivism paradigm, in which learning is the result of its own construction (learners) as a result of its interaction with the learning environment(Daryanto, 2010).

The current 2013 curriculum is the same as the constructivism paradigm, where learners are required to find information independently of their interaction with the environment inside and outside the school. According to Daryanto (2010), the concept of environment includes learning places, methods, media, assessment system, as well as facilities and infrastructure needed to package learning and organize learning guidance, making it easier for learners to learn. The role of teachers in the learning process based on constructivism paradigm is only as facilitator, mediator and mentor.

The use of Student Worksheet in the learning process is one of the efforts to create a more qualified learning. However, from various kinds of Student Worksheet that are often used and provided by the school for the learning process, especially chemistry is the Student Worksheet in the form of print media.

Based on observations in SMA NEGERI 1 TEBING TINGGI, there are also student who misuse smart phone during learning in class, many students who use android smart phones but the utilization of smart phones as a media of learning is not optimal because only a few students who know the existence of learning media or Student Worksheet using android smart phone. In addition, teachers are still using conventional methods in teaching so that learners feel bored and less interested in learning activities.

Mobile devices that are majority owned and used in everyday learners are communication tools in the form of android mobile phones. Android is a mobile operating system that adopts Linux operating system, but has been modified.

According Sambodo (2014) android can be a complete learning media in the delivery of a learning material. Many research companies naming android as smart phones, because android formed on open source software (Linux), which means developers can create an application in accordance with the creativity of each individual, with so android can be used anywhere. The research conducted by Sambodo entitled “Pengembangan Media Pembelajaran *Mobile Learning* berbasis Android untuk Siswa Kelas X SMA/MA” with development model 3D (Define, Design, Develop). The results of development research have excellent quality.

In 2013, an estimated 24 percent of mobile phone users in Indonesia owned a smart phone and this figure is projected to more than double to 53 percent by 2017. The number of mobile phone users in the country stood at around 173 million in 2013 and will rise to over 195 million people by 2017. This means that a projected 103.5 million people in Indonesia will own a smart phone in 2017, equivalent to 37.5 percent of the entire population. In 2013, mobile phone internet user penetration in the country was at 22.8 percent and this is expected to almost double to 45.3 percent by 2018. Some of the most popular online services amongst mobile internet users in Indonesia were Gmail, Yahoo Mail, and BlackBerry Messenger (BBM) (Statista,2018). Based on research aims to the develop the English for Disability (EFORD) application, on Android-based learning english media for Visually Impaired students and determine its based this on assessment of matter expert, media expert, special needs teacher and students. The research method adopted in this research is Research and Development (R&D). The development of this application through five phases: (1) Analysis of problem, through observation and interviews. (2) Collecting information as product planning/ analysis of the needs of the media as required of blind children. (3) The design phase of products such as the manufacture of flow and storyboard navigation map. (4) Design validation phase form of an expert assessment of the media are development. (5) Testing products phase, such as assessment of the application by blind students (Azmi,2017).

Information and communication technologies (ICT) have become commonplace entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavour within business and governance. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education lends itself to more student-centred learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21st century (Amin,-).It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. These possibilities can have an impact on student performance and achievement. Similarly wider availability of best practices and best course material in education, which can be shared by mean of ICT, can foster better teaching and improved academic achievement of student (Richard,2015).

Today, as we all know that the development of hardware for mobile device is getting better and the performance index is very high than the actual requirements of the software configuration. Phone's features are now more dependent on software or application. Android is an open source Operating System for Mobile devices, It is initially developed by Android, Inc., which was bought by Google in 2005, Android was revealed in 2007, along with the founding of the Open Handset Alliance – a consortium of software, hardware and telecommunication companies dedicated to advancing open standards for mobile devices. According to the Wikipedia in July 2013, there were over one million Android application were published on the Google Play store, and over 50 billion applications downloaded. According to the Wikipedia in April–May 2013 survey of mobile application developers found that more than 71% of developers created applications for Android. History of Android with the release of the Android beta

version in November 2007. Android 1.0 (First version), the first commercial version was released in September 2008 (Singh,2016).

Android studio offers tools such as rich code editing, profiling tool, debugging and testing. The app developed can run either in virtual device such as emulator or any connected mobile phone while testing (Nandhini,2018).

Mobile Application Development refers to the process of making application software for handheld devices such as mobile phones and Personal Digital Assistants. Through the usage of mobile apps, the user is provided with various features that will enable him to fulfill all his needs and much more. Apps should be interactive to the users. Apps can be downloaded from various platforms such as Google Play Store and iOS App Store. There are free apps as well as paid apps. Some apps can be used for free for a specific amount of time before subscribing for premium membership. For apps with a price, about 20%-30% goes to the distribution provider(Example-iTunes) and the rest to the producer of the application. (Bakhta,2017).

Development of Student Worksheet is required to be able to overcome the problems in the learning process, one form of the development of Student Worksheet is the use of information and communication technology in the field of education. The form of the utilization of information and communication technology is mobile learning (m-learning), one part of electronic learning (e-learning). M-learning is a media of learning by using mobile devices such as mobile phones, PDAs, laptops, and tablet PC (Astra, 2012).

The Student Worksheet based on android that developed contains material and exercise questions that learners can use as self-learning media. The material contained in this Worksheet developed is compiled from various learning sources, so as to provide students with a wider insight into the material. Insights held by learners is what affects the liveliness in the learning process.

Based on description above, the researcher are interested to develop of student worksheet using android mobile. So the title of this rsearch is : **The Development of Student Worksheet Based Android Mobile on Buffer Solution Topic.**

## 1.2 Problem Identification

Based on the background explained above, the problem identification in this research includes:

1. How is the properness of Student's Worksheet existed ?
2. How is the properness of Student's Worksheet Based Android Mobile ?
3. Does Students' Worksheet based on android can increase student learning achievement?
4. Does Students' Worksheet based on android can increase students motivation?

## 1.3 Problem Limitation

To make this research well directed the problem needs to limited to applying of student worksheet base it (android mobile) on buffer solution topic increasing student motivation to study and student outcomes.

## 1.4 Problem Formulation

The problem formulation of this research are:

1. How is the quality of student's worksheet existed ?
2. How is the quality of student's worksheet based android mobile ?
3. Does students' worksheet based android mobile on buffer solution topic give higher significant difference compared to direct instruction worksheet model to student learning motivation on buffer solution topic?
4. Does students' worksheet based android mobile on buffer solution topic give higher significant difference compared to direct instruction worksheet model to student outcomes on buffer solution topic?

## 1.5 Research Objective

The objectives of this research was used:

1. To know the quality of student's worksheet existed.
2. To know the quality of student's worksheet based android mobile

3. To know the students' worksheet based android mobile on buffer solution topic give higher significant difference compared to direct instruction worksheet model to student learning motivation on buffer solution topic
4. To know students' worksheet based android mobile on buffer solution topic give higher significant difference compared to direct instruction worksheet model to student outcomes on buffer solution topic

### 1.6 Research Benefit

1. The result of this study are expected to provide information to teachers the chemistry of learning difficulties experienced by student's especially in buffer solution topic.
2. This research help the students finding the problem of chemistry, especially buffer solution topic.
3. This research can be used as references for the future research.

### 1.7 Operational Defenition

1. Android Mobile is use of computers to store, retrieve, transmit, and manipulate data, or information, often in the context of a business or other enterprise. It is considered to be a subset of information and communication technology (ICT).
2. Buffer Solution is a solution that can maintain its pH if added to acidic, base or water.
3. Student's Worksheet
4. Motivation Student Outcomes