CHAPTER I
INTRODUCTION

1.1.Background

Education is a conscious and systematic effort by people who are responsible for influencing learners to have the nature and character according to the ideals of education (Achmad, 2004: 34). The ideals of education or known as the purpose of education is the direction to be addressed through education that can be realized in the learning process both inside and outside the classroom.

The purpose of the learning process includes various aspects that are defined as the outcome of the learning itself, one of which is the cognitive aspect. Cognitive aspect is the intellectual ability of students in thinking, knowing and solving a problem. According to (Bloom, 1956) the cognitive aspect has a domain destination consisting of six parts, namely knowledge, understanding, application, analysis, synthesis, and evaluation.

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).

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.

The use of learning media is one way to support the achievement of learning purposes. The use of appropriate media and variations in the learning process can increase the motivation to learn and can reduce the passivity of students. Learning media should be packaged interesting so that students can linger learn a learning material. Learning media are often used in schools such as power point, video learning, text modules. But the learning media cannot be used at any time by students. Less varied media is distributed not solely teacher error, but because of less optimize technological developments.

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 behavioristic 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: 3-4).

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: 5), 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 PERBAUNGAN, many students who use android smartphone but the utilization of smartphones 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 smartphone. In addition, teachers are still using conventional methods in teaching so that learners feel bored and less interested in learning activities.

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: 175-176).

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 smartphones, 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.

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.

The material chosen in this study is the Acid-Base material studied in class XI in accordance with the 2013 curriculum. Acid-Base material is chosen because the material is a chemical material that requires a long time understanding to study, the subject matter is sufficiently large it takes a media that can be used by learners to learn independently to facilitate the learning process considering the learning time in school is much less than the time learners outside school.

Based on the research conducted by Wahyu Fajaryanto entitled "Pengembangan Stoichiometry Squadron Berbasis Mobile sebagai Media Pembelajaran Mandiri untuk Peserta Didik SMA/MA Kelas X Semester Gasal" in 2013. Application of "Stoichiometry Squadron" developed file.apk format that can be operated on mobile phone Android. The development model used is the ADDIE development model (analysis, design, development, implementation, evaluation). The results of development research have excellent quality based on students' appraisal.

The next research conducted by Devi Septi Rukmana entitled "Pengembangan Permainan Chemist Academy Berbasis Mobile Game sebagai Media Pembelajaran Eksperimen Mandiri Peserta Didik SMA/MA Kelas XI Semester I Pokok Bahasan Laju Reaksi" in 2013. Game "Chemist Academy" Based Mobile Game developed formatted file.apk. The development model used in the making of this instructional media adapts the development model of ADDIE (analysis, design, development, implementation, evaluation). The results of development research have good quality.

And the next research conducted by Afi Yustiana entitled “Pengembangan Media Pembelajaran Kimia Berbasis Android Pada Materi Senyawa Hidrokarbon Dan Minyak Bumi Untuk Peserta Didik SMA/MA Kelas XI” in 2015. Learning media based on android chemistry which developed in the form of application with formatted file.apk (Android PacKage) measuring 14.49 megabytes, named "CHiP". The development of android-based learning media that includes stages planning, organizing, implementing, assessing, and analyzing data. The result of development research have excellent quality.

Based on the above background, the researcher tries to develop Student Worksheet in chemistry learning and to process the use of android application in the development of Student Worksheet to facilitate students to study independently and to support success in learning activities. Then the researcher is interested in conducting research entitled

"The Development of Student Worksheet Based Android on Acid-Base Materials".

1.2.Problem Identification

In accordance with the background of the above problems, the following problems can be identified:

1. Student Worksheet used in chemistry learning process is still limited to print media.
2. Student Worksheet should develop in accordance with technological developments and can be used by learners as a self-learning media that is practical, economical, and not bound by time and space.
3. Many learners who own and use mobile devices in the form of android phones, but not yet used optimally to expedite the learning process.

1.3.Problem Limitation

The problems studied in this study are limited to:

1. Student Worksheet developed in the form of android application.
2. Student Worksheet developed can be disseminated and installed by learners easily without installing other applications.
3. The developed android app is used as a Self-Student Worksheet of SMA / MA class XI students easily accessible without an internet connection (offline).
4. Student Worksheet can only be operated by using android mobile phone and can be studied in order to get the material overview, additional material, and practice questions.
5. Student Worksheet which is made containing material, exercise questions and discussion about Acid-Base related matter based on Basic Competence in curriculum 2013.

1.4.Problem Formulation

Based on the above description, can be formulated research problems as follows:

1. How the quality of the Student Worksheet based android which has been compiled?
2. Can Student Worksheets based android increase the interest / motivation and self-learning of students?

1.5.Research Objectives

Based on the above problem formulation, the research objectives are as follows:

1. To know the quality of Student Worksheet based android which has been compiled.
2. To know the Student Worksheets based android can increase the interest / motivation and self-learning of students.

1.6.Research Benefits

The results of this study are expected to have benefits for teachers and high school students in general and for researchers in particular. In general, the benefits derived from this research are:

1. **For Educators (High School Teachers)**
   a. The existence of practical experience in the field of scientific research can add insight into thinking and deepen the ability in the use of Student Worksheet is effective and efficient in the learning process.
   b. The existence of this research adds chemical learning media in the form of Student Worksheet on the Acid-Base material that can be used by the teacher as a self-learning tool to facilitate the learning process.
2. **For High School Students**
   a. As a self-learning media in the form of Student Worksheets (LKS) that can be accessed anytime and anywhere without an internet connection (offline).

b. Increase the interest of learners in studying chemicals about Acid-Bases.
c. Improving the comprehension of learners that can improve learning outcomes of learners.

3. **For Researchers**

This research is useful for researchers because it can improve the insight and knowledge in training skills as an educator and can improve the skills of researchers in making learning media in the form of Student Worksheet for the learning process.

1.7.Operational Definition

1. Research development is an attempt to develop effective educational products in the form of learning materials, media, strategies, or other materials in learning to be used in schools not to test the theory (Gufron, et al, 2007: 5).
2. Learning is a process undertaken by an individual to gain a whole new behavioral change, as a result of the individual's own experience in interaction with his environment (FIP-UPI Educational Science Development Team, 2007: 137).
3. Media is an intermediary or delivery message from the sender to the recipient of the message.
4. Student Worksheet is a worksheet that provides learning instructions on selected topics or subject matter and is accompanied by questions or exercises.
5. Android is an operating system for Linux-based mobile devices that includes operating systems, middleware and applications (Nazruddin, 2012: 1).
6. Application is a collection of program commands created to perform certain jobs (special) (Hendrayudi, 2009: 143).
7. Basic Competence is content or competence consisting of attitude, knowledge, and skill that come from Core Competence which must be mastered by learners.