CHAPTER I
PRELIMINARY

1.1. Background

Education is an attempt to prepare the next generation to welcome and face the global era. Technological advancements have an impact on education. The media, methods, and interest in learning are all inextricably linked to the learning process. Media can be used to deliver educational materials to students delivered by teachers. While the learning method governs how teaching materials and delivery strategies are organized. (Nurrita, 2018).

The learning process is expected to be in accordance with PP No. 19 concerning SNP 2005, which states that the learning process in educational units is interactive, inspiring, fun, and challenging students to participate actively, also providing sufficient space for initiative, creativity, and independence in accordance with students' talents, interests, and physical and psychological development. (Sukiyasa and Sukoco, 2013).

Today, it is impossible to avoid the impact of science and technology on the world of education, so the world of education must constantly adapt technological developments to efforts to improve educational quality. (Rusdi, 2016).

Learning media is one of the developments in information technology that has an impact on the world of education. As a result, the education sector must be able to use technology to create multimedia-based learning media that are more appealing, interactive, and comprehensive. Visual media such as pictures, floor plans, maps, and diagrams, as well as audio visuals such as videos and sound slides, are excellent choices for improving educational quality. Learning media can also be very useful and beneficial for students if they are directly involved in its use. This is consistent with Mulyanta (2009), who stated that learning media is critical because it has a significant impact on classroom teaching activities. Relevance, convenience, attractiveness, and usefulness are four important factors in good learning media.

The use of appropriate media in the classroom can improve the learning process. Because, as stated by Yektyastuti and Ikhsan (2016), the use of media in

learning can help educators' limitations in conveying information and the limitations of class hours, the more relevant a media is, the more interesting and useful the use of media will be.

One type of ICT-assisted learning media that can be used is learning media that is operated on a smartphone device running the Android operating system. Currently, the Android operating system is the most popular and widely used by the public, particularly among high school students. In Indonesia, Android users accounted for 65.9% of all smartphone users as of June 2015. (statcounter in Liliarti and Kuswanto, 2018).

The creation of Android-based learning media meets the requirements of the 2013 Curriculum. The incorporation of Information Technology (IT) into all subjects is one of the changes in the 2013 Curriculum. IT is no longer a subject in and of itself, but rather a vehicle for all other subjects. This means that teachers in various subject areas, including chemistry, must initiate widespread and effective use of IT. With the advancement of mobile learning media, students will be able to access and learn from anywhere and at any time. This means that students will take a more active role in their learning, in line with the learning mandate in the 2013 Curriculum, which emphasizes students as the center of learning. (Solihah, d.k.k., 2015)

A periodic table of elements is well-known in chemistry education. The periodic table of elements is a table that lists the names of chemical elements and categorizes them based on how similar their properties are. The elements in the periodic table are divided into eight major groups, namely groups I A to VIII A, and transition groups, namely groups I B to VIII B. These elements are also classified into three types: solid, liquid, and gaseous.

Students are expected to memorize and understand many elements during the teaching and learning process, as this will be useful when they learn the next material. Even though the periodic table introduced to students by the teacher is still in the form of a manual that only contains the names of chemical compounds and their groups with no additional information. This is certainly inconvenient for students and even makes them lazy when studying chemical elements. If students

are lazy and lack interest to learn chemical elements, they will become tired of studying further material related to the periodic table of elements, because the periodic table of elements is the foundation for studying chemical elements in the following lesson. According to Herawati, d.k.k. (2013), media assistance will be very beneficial for students' thinking processes in order for them to correctly understand the material.

Based on observations made at SMAN 5 Medan, it was discovered that the majority of chemistry teachers have yet to use, let alone develop, interactive multimedia-based learning media in the process of teaching and learning activities. Most teachers continue to use traditional methods of instruction in the classroom. If a teacher continues to deliver subject matter using traditional methods, students' absorption of the subject matter is not optimal. If this is done repeatedly without any variation in learning methods, students will quickly become bored in subsequent lessons, resulting in low student interest in learning, so that students often prefer to play android, such as opening social media, rather than using android to help the learning process. Furthermore, students at these schools are permitted to bring androids or other communication devices to school. As a result, it is not surprising that many students fail assignments or daily tests.

In a study on chemical bonding materials conducted by Putri and Iis Siti Jahro (2022), it was concluded that the feasibility of developing interactive multimedia based on the Lectora Inspire based on BSNP criteria assessment categorized as "Very Feasible" with the results of media validation from 3 validators categorized as "Very Feasible" because the average percentage of validation results from 3 validators was above 90%, namely 95.3; 91.7 and 100%. For the results of material validation from 3 validators categorized as "Very Feasible" too, because the average percentage of validation results from 3 validators was above 95%, namely 97; 97 and 95.7%.

While Mastur (2018)'s research obtained validation results from material experts, media experts, and chemistry teachers, the percentages were 74, 87.6, and 79%, respectively. The implementation of students through a questionnaire resulted in a 96% presentation in the very good category. Overall, it is possible to conclude

that interactive media on reaction rate learning is appropriate for use as a learning media in high school.

Based on the problems and previous studies described, the development of learning media is required to be able to overcome problems in the learning process and increase student interest in learning, with one form of media development that is comfortable and interesting for students, such as learning media based on Android. Learning media will be created in this study using the Android-based Smart Apps Creator software. The researcher chose Smart Apps Creator because it can be used offline, which means students do not need a data package to use it. Furthermore, if there is an error in the preparation of the media, this application can be repaired and is simple to use.

Based on the explanation above, the researcher recognizes the significance of engaging learning media for students to use. In this context, researchers are interested in creating media and conducting research under the title "**Development of Learning Media Based Android Assisted by Smart Apps Creator on Atomic Structure and Periodic System Elements Material**"

1.2. Identification of Problem

Based on the above description of the problem's background, the following problems can be identified:

1. Chemical element education in schools continues to rely on conventional learning methods and the manual periodic table of elements.
2. The manual chemical periodic table is less interactive.
3. Students struggle to learn and remember the chemical elements listed in the periodic table of elements.
4. Less than optimal use of android to support in the learning process

1.3. Scope of Problem

To avoid the widespread problems in this study, it is necessary to limit the problems in this study as follows:

1. Learning media that has been applied in this research is android-based media.

2. The interactive learning media created in this study combines sound, text, which will be made into one containing material, images, animations, and evaluation exercises on atomic structure and the periodic system of elements complete with discussion of questions.
3. The subjects of this study were students of class X IPA-4 SMAN 5 Medan.
4. The material taught and tested in this research is the atomic structure and the periodic system of elements.

1.4. Problem Formulation

The formulation of the problem contained in the background that has been described is as follows:

1. What are the results of the analysis for media needs at SMA Negeri 5 Medan?
2. What is the intended design based on the results of the analysis for media needs at SMA Negeri 5 Medan?
3. What is the level of feasibility based on the validator's validation results on the developed media?
4. How are the students' responses to the learning media based android developed in learning the atomic structure and periodic system of elements at SMAN 5 Medan?

1.5. Research Objectives

The objectives of this research are as follows:

1. To determine the results of the analysis for media needs at SMA Negeri 5 Medan.
2. To find out the intended design based on the results of the analysis for media needs at SMA Negeri 5 Medan.
3. To find out the level of feasibility based on the validator's validation results on the developed media
4. To find out the response of students to the android-based learning media that was developed by students to the learning media based android which was developed in learning the atomic structure and periodic system of elements at SMAN 5 Medan.

5. To develop android-based learning media that can increase student's interest in learning chemistry, especially in the atomic structure and the periodic system of elements material.

1.6. Research Benefit

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 obtained 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 to use effective and efficient learning media in the learning process.
   b. The existence of this research adds to the learning media for chemistry, atomic structure and the periodic system of elements that can be used by teachers as a means of independent learning to facilitate the learning process.
2. For high school student
   a. As an independent learning media that can be accessed anytime and anywhere
   b. Increase students' interest in studying chemistry about the atomic structure and the periodic system of elements
   c. Increase students' understanding power which can increase students' learning interest.
3. For researcher

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

1.7. Operational Definition

1. Development

   Development is a process or steps to develop a new product, or improve an existing product, which can be accounted for in the form of texts, media,

strategies, and other textbooks used outside of school. The development in this study is the creation of media based on Android applications that are intended to facilitate student learning and increase student interest in learning chemistry, particularly in the subject of atomic structure and periodic system elements. The development of learning media is based on the results of the analysis used to identify students' needs in learning and identify materials included in learning media based on android applications

2. Learning Media based Android

   Learning media is a tool for understanding the material presented by educators in the form of print and electronic media and this media is also a tool to facilitate the application of the components of the learning system, so that the learning process can last a long time and be effective. In the context of this research, the media that will be created is a learning media in the form of an application based android.

3. Smart Apps Creator

   Smart Apps Creator is an innovative digital interactive media platform that creates multimedia content for mobile devices. Include an intuitive user interface, interactivity, and design. Without breaking a sweat, create an iOS and Android app and publish it to the google play store. HTML5 and.exe output extensions make the application compatible with all devices and touch monitors. Create a learning media-based Android application with minimal effort and customize the content app without any programming knowledge.