

CHAPTER I

INTRODUCTION

1.1. Background

Educational is something which can not be separated from human life along with the times. Even in this era of globalization, education is used as the key to a country's development. The success of development in a country is influenced by its Human Resources. Quality of Human Resources is the main capital in competition in the era of globalization. This is due to the increasing number of people in the world so that competition is getting tougher, natural resources are decreasing and technological developments are getting faster.

The Indonesian government strives to improve the quality of its human resources starting from the education sector. In 2014 the Indonesian government through Permendikbud officially changed the KTSP Curriculum to the 2013 Curriculum. This curriculum change is intended so that Indonesian young people have critical, creative, productive, independent, collaborative, communicative, and affective thinking (Setiawan et al., 2013). In the 2013 curriculum learning, students are emphasized on the scientific approach, namely observing, formulating problems, collecting data, analyzing data, drawing conclusions, and communicating. The application of a scientific approach to learning can be realized through several learning models, one of which is discovery learning (Koirewoa, 2018).

Developments is closely related to the revolution industry 4.0 are characterized by the widespread use of technology in all aspects of life, not least in the field of education. Learning media is the contribution of technology in the world of education. According to (Tafaono, 2018), learning media is anything that can be used to convey teacher messages to students so that it can stimulate students' thoughts, feelings, attention, interests, and motivation. Android-based learning media is a manifestation of technology in education. This is supported by the large number of students, especially high school level students, who make android as a primary need (Lubis & Ikhsan, 2015).

Researches on the development of android-based learning media have been carried out and most of them have a positive impact on students. Prasetyo et al. (2015), states that the application of Android-based chemistry learning media can significantly increase student motivation in colloid material. Harianto et al. (2017), states that the Android learning media can effectively foster students' scientific literacy in redox and electrochemical reaction materials. Ulfa et al. (2017), states that the application of android-based learning media can improve creativity and cognitive achievement of students on the material stoichiometry, and Ramadhani et al. (2016), states that the application of Android-based learning media was able to improve student learning outcomes on colloid material.

Chemistry is a branch of science that studies the properties of matter, the structure of matter, changes in matter, and energy involved in reactions (Sudarmono, 2006). Strong mastery of concepts is very important in studying chemistry. These concepts are related to one another so that it often makes it difficult for students.

The difficulty of students studying chemistry will continue if it is not immediately resolved. One chemical material that is considered difficult is acid-base titration. According to Sheppard in Marzuki & Astuti (2017), students describe the neutralization process as a physical acid-base mixing that does not produce a product and has no reaction equation. Relevant research regarding student difficulties in understanding acid-base titration material was also presented by Widarti et al. (2017), Nurhafidhah et al. (2015), Supatmi et al. (2019), and Barke et al. (2019).

This problem is exacerbated by the Covid-19 pandemic that has recently hit the world. Students in Indonesia are also affected. The learning process must be done online from each home. There are many obstacles that occur during online learning, one of which is learning resources. If usually students get books from school, it is different during online learning. Students must find their own online sources which sometimes do not match the learning syllabus.

Handout is a teaching material which contains a set of material, both new and in-depth, which is important for students. Handout can be used as practical and economical teaching materials. In addition, handout can also be used as

reference materials and reminders for students when learning online because they contain systematic material (Prastowo, 2013). According to Steffen-Peter Balistaedt in Ulya et al. (2015), handout has several advantages, namely (1) as a companion to the teacher's explanation, (2) as student notes, (3) as a reference material for students, (4) as a reminder of the subject matter, (5) motivating students to seek know more deeply, (6) give member feedback, and (7) assess learning outcomes. According to Fatikhakh et al. (2018) and based on the experience of researchers during internships 1, 2 and 3, teaching materials in the form of handouts, especially those integrated with HOTS questions, are very rarely found, even though HOTS's ability greatly determines the level of education quality according to PISA (Programmed International Science Assessment) and TIMSS (Trends International Mathematics and Science Study).

Based on the description above, the researcher is interested in conducting development research with the title "**THE DEVELOPMENT OF ACID-BASE TITRATION HANDOUT BASED ON ANDROID INTEGRATED DISCOVERY LEARNING MODEL AND HOTS PROBLEMS**".

1.2. Problem Identification

Based on the description in the background of the problem, the identification of problems in this study are as follows:

1. Students' difficulties in understanding acid-base titration material.
2. Lack of student learning resources on acid-base titration material which emphasizes HOTS problems.
3. Lack of Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems
4. The use of smartphone is not optimal among high school students to support the learning process.

1.3. Problem Formulation

Based on the background of the problem and problem identification, the problem formulations in this study are as follows:

1. What are the analysis results regarding to the advantages and disadvantages of acid-base titration handout in internet?
2. What is the feasibility level of the Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems which has been developed?
3. How do students and teachers respond to the Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems which has been developed?

1.4. Problem Limitation

In order to focus the research is not wide of the goal, then the problem limitations in this research are as follows:

1. The research was conducted in the high school curriculum of 2013
2. Subjects are science XI grade high school students in Semester 2
3. Material is focus in the acid-base titration
4. Development of Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems is packaged in application form
5. This research is focused on developing Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems which is used as a learning resource.

1.5. Research Objectives

The objectives of this study are as follows:

1. To determine the analysis results regarding to the advantages and disadvantages of acid-base titration handout in internet
2. To determine the feasibility level of the Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems which has been developed
3. To determine students' and teachers' response to the Acid-Base Titration Handout Based on Android Integrated Discovery Learning Model and HOTS Problems which has been developed

1.6. Benefits of Research

1.6.1. Theoretical Benefit

As a new development in android-based learning media especially in acid-base titration material.

1.6.2. Practical Benefit

1. For Researcher

Increasing knowledge and train skills as a prospective educator and in making teaching material or media innovation.

2. For Teachers

Can be used as an alternative source of learning for teaching, especially when online learning.

3. For Students

Can be used as a learning resource during online learning, especially in the acid-base titration material.

1.7. The Operational Definition

1. Handout referred here is a handout in the form of an application that can be used on Android. This handout is compiled based on discovery learning syntax and is complemented by HOTS questions.

2. Android is a Mobile Operating system (OS) based on Cornel Linux which is currently being developed by Google and can be operated in all types of smartphone.

3. Discovery learning is a learning model which has six learning syntax namely Stimulation, Problem Identification, Data Processing, Verification, and Generalization.

4. HOTS problems referred here are based on C4, C5, C6 of Bloom's Taxonomy and require logical reasoning.