

## CHAPTER I

### INTRODUCTION

#### 1.1. Background

The learning process has interrelated components, namely curriculum, process, and product. The curriculum is the material to be taught, the process of how to deliver the material, and the product as a result of the learning process. The curriculum as an absolute requirement of education in school plays an important role in the learning process because it contains educational plans that are central position in the education process, so that the interaction between teacher and student is done based on the guidance on the curriculum.

Currently, the curriculum in Indonesia is dynamic due to various efforts made by the government to improve human resources through improving the quality of the education. The curriculum has changed over the last five years. Curriculum change is one of the efforts to improve the quality of education including the development of several methods, models, approaches, and learning strategies (Setiyadi, 2017). The current curriculum that the Government of Indonesian Republic through The Ministry of Education and Culture has been applied is the National Curriculum of 2013. Learning on the curriculum of 2013 has differences with the previous curriculum because it emphasizes the scientific approach as well as guiding students to find out (discovery learning) (Buhungo, 2015). Implementation of the 2013 curriculum includes strengthening of spiritual attitudes, social attitudes, knowledge and skills in the learning process. The learning process is the main key in student learning activities. In the 2013 curriculum, learning activities need to use the principles of: 1) student-centered, 2) develop the creativity of learners; 3) create fun and challenging conditions; 4) be charged with value, ethics, aesthetics, logic, and kinesthetics; and 5) provide diverse learning experiences through the application of fun and contextual, effective, efficient and meaningful strategies and learning methods (Permendikbud no. 65, 2013). Therefore, the implementation of Curriculum of 2013 in terms to increase the quality of education

is required so many things such as learning program, learning approach, quality of teachers, and learning resources.

Learning resources are material systematically compiled by teachers used in learning process. The materials can be packaged in print, non-print and can be audio visual. Teaching materials that are constructed by educators can be in the form of textbooks, handouts and student worksheets (LKS) (Soegiranto, 2010). Textbook is one of the main learning resources that students and teachers can use. The textbook should be structured in such a way and adapted to the applicable curriculum and learning objectives (Suhardi, 2007).

Ariningrum (2013) found that the textbook was one of the important variables that support the learning process, curriculum, and learning instruction, especially in developing countries to improve the scientific skills of students. In Indonesia, textbook is a mandatory reference for use in primary and secondary education (Permendiknas no. 11, 2005). A textbook is arranged according to the need of students learning. Textbook is designed to achieve specific learning aims or specific competencies (Permendikbud RI no. 02, 2008 Pasal 1 (3)). Therefore, the preparation of designing a textbook should be based on the applicable curriculum, and in this case is the Curriculum of 2013.

According to my preliminary research carried out in Senior High School Medan showed that books have been referring to the Curriculum of 2013. These books are from National Education Standards Agency or in bahasa known as Badan Standar Nasional Pendidikan (BSNP). The analysis of the fulfillment of the standard content of a textbook should include: 1) the learning aims; 2) the information that logic with good language; 3) interesting concepts; 4) interesting presentation. Those textbooks were found to contain the materials and a bunch of question for practice, but lack of instructions in the learning activities that expected to help students to build the concepts being taught. According to the Ministry of National Education (2008), one of the reasons why teaching materials should be developed is the availability of teaching materials in accordance with the demands of the curriculum, meaning that the materials developed must be in accordance with the curriculum by taking into account the target characteristics such as social environment, culture, geography,

stages of student development, students as targets. Development of essential teaching materials is done by educators to make learning more effective, efficient, and not deviated from the competence to be achieved. Therefore, teaching materials are very important to be developed as an effort to improve the quality of learning. So, it is very important to develop a scientific approach-based textbook in the learning activity that could be used both by teachers and also students.

Widyanarti (2011) states that the development of the textbook is useful to: 1) improve the knowledge, 2) improve the curiosity, 3) improve the critically thinking, 4) practice the patience, and 5) improve the social skills. The development of biology textbook has done in this research, which containing the operational steps of each step of scientific approach in accordance to the demands of Curriculum of 2013.

Scientific Approach is an approach that conducted by 5 learning steps relevant to the learning theory of Bruner, Piaget, and Vygotsky those are observing, asking, collecting the information, associating and communicating (Rahayu, 2016), as well as focused on the dimension of modern pendagogic to the learning methodology, namely learning that touch on 3 areas, known as: attitude, knowledge, skills. Through this approach it is expected that learners can answer their curiosity through a systematic process as well as scientific steps. In this series of scientific learning process, learners will find the meaning of learning that can help learners to optimize cognition, affection and psychomotor (Musfiqon & Nurdyansyah, 2015).

The learning process with scientific approach geared to “seek out and do something”, so the students can build their own concept of what is taught by seeing their surrounding environment. Surjawanta (2011) stated that by developing scientific skills, student would become more creative, be capable to find and develop their own fact and concept, as well as foster and attitude of scientific processes. Therefore, scientific approach is very important to be applied in the learning process, especially in biology subject matter.

Actually the scientific approach has been introduced and used in Curriculum of 2006 however it was found that it was not well implemented yet as mentioned above that the successful of the implementation in Curriculum of 2013 also determined by

the availability good textbook. The application of a scientific approach can be supported in accordance with the teacher's creativity. Teachers can develop their own teaching materials in their respective schools by directing learning in the approach to science (Sudrajat, 2013). In fact, according to a research of evaluation that conducted by Puslitbang Kebudayaan, 13.78% of teachers do not understand the substance of the textbook yet do not even understand the relationship of the learning activities and the source of media of learning and the competences that developed (Puslitbang). One of the competencies that a teacher needs to have in carrying out his/ her duties is to develop teaching materials, such as textbook. Development of textbook is important for teachers to make learning more effective, efficient, and in accordance with the competence to be achieved. This is in accordance with the Regulation of the Minister of National Education no.16, 2007 which regulates the standard of academic qualification and teacher competence, that is for the teachers in Senior High School level, both in the demands of pedagogical and professional competence is closely related to the ability of teachers in developing learning resources (Ministry of National Education, 2008).

Based on the writer's observation, some teachers are not capable to develop learning resources, included biology textbooks, especially a textbook with a scientific approach. Prastowo (2012) argued that teachers had not been able to develop creativity to prepare & create independently and choose ready-made textbooks because it is thought that developing textbooks is a difficult job and takes a long time in the process of making it. In addition, based on the observation, scientific-based teaching books for science subjects have been published by the government in the form of handbook for teachers and students at Junior High School level. However, at the Senior High School level, textbooks based on a scientific approach have not yet been published by the government. Some publishers have already done so, as writer already analyze several books used in Senior High School, for example book written by Irnaningtyas (Erlangga, 2016) and also book from Bailmu written by Prawirohartono, S., dan Sri Hidayati (2013) but the contents of the book still tends to present the whole material without

directing students to learn by using a scientific approach by determining problems, solving problems, and defining concepts independently.

According to the background described above, it is necessary to develop a High School Biology Textbook which contains learning steps in accordance with a scientific approach. Because of the important role of the textbook to improve the quality of the learning process in high school, the teacher as the individual who is most responsible for the success of the learning process, is required to be able to understand the understanding, characteristics, principles, rules and procedures of module development. Learning by using textbook is not only focuses on teachers but students can do independently. The use of textbook is also not dependent on other learning media or should not be used together with other media so more efficient. These developments are very important to be created by teachers to make learning more effective, efficient, and also according to the competence to be achieved. Otherwise, there is a concern that there are some differences in the perception of biology teachers about the scientific approach in teaching and learning in high school.

In this study, books that have been developed using a scientific approach will then be implemented by giving books to students to be used as textbooks while studying the topic of the motion system and circulation system. The implementation phase is done directly without pretest. After the book developed using a scientific approach to the topic of the motion system and circulatory system has been read by students, at the end of the meeting they will be given a posttest to see the results of student learning achievement and then compared with the learning outcomes of students who learn to use general textbooks. After the implementation phase, the evaluation phase will be carried out. Stufflebeam and Shinkfield (1985: 159) state that: Evaluation is the process of delineating, obtaining, and providing descriptive and judgmental information about the worth and object of goals, design, implementation, and impact in order to guide decision making, serve needs for accountability, and promotes the understanding of the involved phenomena. National Study Committee on Evaluation from UCLA (Stark & Thomas, 1994: 12), states that: Evaluation is the process of ascertaining the decision of concern,

selecting appropriate information, and collecting and analyzing information in orders to report summary data useful for decision makers in selecting among alternatives. Evaluation is a process or activity of selection, collection, analysis and presentation of appropriate information to determine the extent to which a program's objectives, procedures, products or strategies have been achieved, so that it is useful for decision making and can determine several alternative decisions for the next program. Based on the above opinion, it can be concluded that evaluation is a systematic and continuous process (not a result) to collect, describe, interpret and present information to be used as a basis for making decisions and or formulating policies. The purpose of the evaluation is to obtain accurate and objective information about a program. This information can be in the form of program implementation processes, impact/ results achieved, efficiency and utilization of evaluation results focused on the program itself, namely to make decisions whether to proceed, be repaired or stopped. So, the evaluation conducted in this study is an attempt to improve or revise the book developed using a scientific approach after seeing the results of the response to books that have been used by students in learning to analyze books at the implementation stage there are still deficiencies or not. If there are no more revisions to the book developed, it means that the book developed using a scientific approach is appropriate to use.

## **1.2. Problem Identification**

According to the background above, problem which identifies are:

1. Biology textbook for Senior High School grade XI that used is generally more dominant to present materials, concepts and knowledge that are memorizing for students and assessed not yet presented the material by using scientific approach.
2. A good biology textbook which use a scientific approach is not readily available to teachers and students.
3. Teacher have difficulties to develop a biology textbook especially the one with scientific approach.

### 1.3. Problem Scoping

In this case the limitation of the problem needs to be done so that the research goes well and directed. The limitations of the problem in this study are as follows:

1. Developed textbook (teaching material) based on scientific approach on motion and circulatory system topics in accordance with the learning objectives.
2. Developed textbook that have been compiled are validated by validators, namely two lecturers and one biology teacher and tested to students.
3. Developed textbook was assessed based on the feasibility of the content, presentation, and language.
4. Research subjects were students of class XI IPA at SMA Negeri 3 Medan.
5. Students' learning outcomes are measured from cognitive aspects obtained only based on post-test scores.

### 1.4. Problem Formulation

1. Is biology textbook on "Motion and Circulatory System" topics developed using scientific approach fulfill the content feasibility in BSNP criteria?
2. Is biology textbook on "Motion and Circulatory System" topics developed using scientific approach fulfill the presentation feasibility in BSNP criteria?
3. Is biology textbook on "Motion and Circulatory System" topics developed using scientific approach fulfill the language feasibility in BSNP criteria?
4. Is biology textbook on "Motion and Circulatory System" topics developed using scientific approach make the students follow the scientific activities?
5. Is biology textbook on "Motion and Circulatory System" topics developed using scientific approach make students have higher score of learning outcome?

### 1.5. Research Aim

Generally, this research aims is to develop biology textbook for class XI IPA in Senior High School according to the scientific approach. Specifically, this study is to:

1. To find out whether the biology textbook on “Motion and Circulatory System” topics developed using scientific approach will fulfill the content feasibility in BSNP criteria.
2. To find out whether the biology textbook on “Motion and Circulatory System” topics developed using scientific approach will fulfill the presentation feasibility in BSNP criteria.
3. To find out whether the biology textbook on “Motion and Circulatory System” topics developed using scientific approach will fulfill the language feasibility in BSNP criteria.
4. To know whether the biology textbook on “Motion and Circulatory System” topics developed using scientific approach will make the students follow the scientific activities.
5. To know whether the biology textbook on “Motion and Circulatory System” topics developed using scientific approach will make the students have higher score of learning outcome.

#### **1.6. Research Benefit**

The result of this research, are expected could be used for all people who'd like to get the information, those are:

1. For teachers, the developed textbook as this research product can be used to guide the implementation of the scientific approach on “Motion and Circulatory System” in class XI IPA in Senior High School; open the minds of teachers thinking in teaching so as to improve the less interesting and monotonous learning by developing innovative learning models.
2. For students, the developed textbook which produced from this research could guide the students to be actively in learning process by following the scientific approach learning steps that had developed.

3. For school, the results of this study can be used as examples of improving the quality of learning that can be done and applied through improving student learning outcomes and teacher performance in schools.
4. For other research, the information that contained in this could be used as the source that can be used for other researcher to develop the research that has been performed.
5. For readers, the information and result that got, could be used as the source of other references on learning period or the next researches.

### **1.7. Operational Definition**

1. Fulfillment of BSNP criteria will be achieved when the score based on the criteria of BSNP is equal to or greater than 60.
2. Students' scientific activities will be measured using questionnaire which score range from 0 – 100.
3. Students' understanding will be measured based on post-test result (students' learning outcomes) with 30 questions and the score range between 0 – 100.