

CHAPTER I INTRODUCTION

1.1. Background of the Problem

To help the learning process, complete learning materials are needed such as books, worksheets, media, and others. One of the teaching materials that is often used is printed books and modules. Modules are a single unit of learning materials that can be learned by students independently. It has clear components and instructions so that students can follow in sequence without teacher intervention. In the substance module that is more emphasized is student independence (self-study at a certain period), the module can be formulated as a complete and stand-alone unit and consists of a unit of a series of activities that are arranged to help students achieve several objectives that are specifically formulated and clear. While what is meant by module teaching is teaching that is partly or entirely based on modules. Modules are a form of teaching materials that are packaged as a whole and systematically. Within the modules are a set of learning experiences that are planned and designed to help learners master specific learning objectives. The module at least contains learning objectives, learning material or substance, and evaluation (Depdiknas, 2008).

In education, the term "module" refers to an instructional unit that focuses on a particular topic. Although the details and activities vary according to the specific context, such as course and students' level, most educational modules include information about the topic, focus on students-centered learning activities and culminate in a project for students to demonstrate understanding. An instructional unit within a larger course or curriculum, usually organized by chronology, topic, or theme. Most online courses are set up with modules that correspond to the weeks or main topics of the semester, and learners proceed through them in chronological order. Each module will have a title and can include a combination of pages,

discussions, assignments, quizzes, surveys, or links to files or external websites. A module is a form of teaching materials that are arranged systematically and intact, in which they contain a set of planned learning experiences and are designed to help students master specific learning objectives. Module at least consists of learning objectives, substance/content of the material, and evaluation. Modules have five main characteristics that become their advantages, namely self instructional, self contained, stand-alone, adaptive, and use friendly (Ditpam SMK 2019). Based on several studies, the use of module has a positive influence on learners.

The results of previous research on the following modules can be some of the reasons why modules have a positive impact on their use on students. Modules developed with guided discovery have many advantages, including modules that can be used independently by students containing concepts that can be discovered or built by students themselves (Uslifatun et al, 2012). Modules are also developed with the aim that students' thinking becomes more critical than usual. The use of modules is also able to foster students' interest and interest. Independent characters also appear with very good criteria, this is because students can do individual tasks independently contained in the module (Rizqi et al., 2013). In the research of Yolantia et al. (2021) results that the effect of using problem-based modules is effective in improving critical thinking skills on food digestive system material, this is evidenced by the posttest in 2 classes that were given two different treatments, one using modules, while the other class did not use modules. The results obtained were that the class that used the module had higher posttest results than the class that did not use the module.

Case- based learning model is a model is a model that involves students to solve problems as a means of learning. During the learning process using the Case Based Learning (CBL) model, students are enthusiastic and more motivated towards the material provided. Apart from that, students are more active in teaching and learning activities, active in discussions to find solutions to the cases given, and most importantly students can relate the material they have received to their daily lives (Arianto, 2020).

Based on several in previous research studies, the advantages of Case Based Learning are, (1) it can develop analytical skills, (2) it can develop the ability to apply context (theory) and reality in the field, (3) independence in searching for and solving tasks through problem solving training, (4) increase self-confidence, enthusiasm, and cooperation in groups, oral (presentation) skills well. Students who use the Case Based Learning Model will find it easy to use basic skills in solving cases given in learning (Dewi & Hamid, 2015). CBL implementation in this case study is considered successful in improving the ability of critical thinking skills of students, this is in line with findings (Kusumawati, et al., 2019), that CBL can improve students' critical thinking skills of students significantly.

Critical thinking skills are very important for students to learn because with this ability, students become individuals who can think rationally during the rapid development of science and technology and are able to make decisions in their lives. Students who have good critical thinking skills will be entrenched in their character and student sality which is implemented in all aspects of their lives. Thus, it is important to empower critical thinking skills in students, which can be integrated through models, methods, media, and learning resources that are proven to be able to empower students' critical thinking skills (Masitah, 2014). This is also in accordance with the opinion of Jannah & Sulianti (2021) that students are an important element in the development and progress of the nation, who will one day lead the nation towards better social change. To be able to become a quality student, of course, cannot be separated from his control of critical thinking skills.

The factor that causes the low critical thinking skills of students is time constraints. Time limitations can have an impact on not achieving learning objectives. This is because students prefer to memorize the material provided by the lecturer, students become inactive, and the learning process does not run optimally (Indrawati, 2023). In addition, the use of learning resources that are not effective and appropriate will make students take longer to understand the learning material. This is the same as

research conducted by Rahmawati (2016) which states that limited learning resources are one of the important factors that affect students' critical thinking skills.

Based on the results of interviews with biology teachers and questionnaires through google forms that have been distributed to 30 students of class XII SMAN 5 Medan, obtained information that biology teachers have never developed a case-based learning module on coordination system material. Based on the results of student's questionnaires, it was found that 43.3% of the level of availability of teaching materials used during biology learning was still lacking, because the teaching materials used so far were textbooks. The results of the students' questionnaire search obtained information that 83.3% stated that there had never been teaching materials that could measure students' understanding independently. Regarding case-based learning, according to the teacher, it has never been applied especially in Biology learning. Critical thinking skill tests have never been implemented on students' evaluation assessments.

The textbooks used so far in terms of content contain learning objectives and the direct arrangement of learning materials, summaries are not in accordance with learning objectives, there are no provoking questions for students to think critically about the coordination system material, the writing is very dense and does not vary and the images provided are black and white, and the book is very thick, so students are not interested in reading it and studying it. The textbooks used are not always relevant to cases in everyday life, making it difficult to relate learning to real contexts. Based on research conducted at SMA Negeri 2 Bandar Lampung, it was also found that students who studied various books experienced confusion because of the different concepts in the books studied, students also have difficulty in studying the book because the pictures and explanations of the concepts are very complex and not easy to understand (Nisak, 2021). Based on research conducted in SMA in Semarang city, the causes of misconceptions include teacher learning strategies that are less meaningful to students, learning resources that are less valid, and learning methods that tend to memorize (Farihah et al, 2016).

The coordination system is one of the subjects of biology that is quite complicated, because it studies parts of the nerves that are difficult to see without aids, many uses foreign terms that are difficult for students to understand. The material of the coordination system in humans is abstract matter. In the coordination system there are many processes that are invisible but occur in the human body. All activity in the body is regulated by the coordination system. Based on the results of observations conducted at SMAN 5 Medan in class XII, as many as 70% of 30 students stated that they experienced difficulties in the coordination system, especially memorizing material in the structure and function of the coordination system. With the same result, based on research conducted at SMA Swasta Kartika in Pematang Siantar, the results of learning difficulties experienced by students in understanding the material of the coordination system are 68.64% (Purba et al, 2021). The coordination system is closely related to other systems in the human body; Therefore, this material is very important to learn.

Based on the explanation of the problem above regarding the importance of teaching materials, the effect of using modules, and there has never been a case-based learning module, the development of module on coordination system material based on case-based learning in class XI Science is important to do.

1.2. Identification of the Problem

Based on the background of the problem that has been stated, the problems that can be identified are as follows:

- 1) At SMAN 5 Medan only uses textbooks as teaching materials, the textbooks used so far, the summary section is not in accordance with the learning objectives, there are no questions that provoke students to think critically about the coordination system material, the writing is very dense and does not vary and the pictures provided are black and white, and the book is very thick, so students are less interested in reading it and studying it.

- 2) There are no teaching materials on coordination system material that can measure understanding independently by students.
- 3) The coordination system material was difficult to understand.

1.3. Scope of the Research

- 1) The object of the research is module based on case-based learning in the topic of coordination system.
- 2) The subjects of the research were 3 experts from biology lecturers, consisting of material experts, learning experts, and design experts, biology teachers, and students of class XI Science 1 and XI Science 2 at SMAN 5 Medan.

1.4. Scope of the Problem

For research not to deviate from the purpose of the study, it is necessary to scope of the problem which is as follows:

- 1) The development of module uses a 4D instructional development model with phases of define, design, development, and dissemination.
- 2) This module developed following the guidelines of Direktorat Inovasi dan Pengembangan Pendidikan Universitas Airlangga 2022
- 3) Regarding the quality elements the module is based on Meityu D Kasaluhe (2021) about guidelines for systematic teaching module.
- 4) The topic that focused on developing the module is the human coordination system.
- 5) The module feasibility assessment limited to being assessed by material experts, learning experts, and design experts.
- 6) To determine the effectiveness of learning by using modules, it can be seen from the quality indicators of teaching by conducting critical thinking skills tests in two classes, namely XI Science 1 and XI Science 2 in SMAN 5 Medan with KKM 75.

1.5. Formulation of the Problem

Based on the identification of the problem that has been described, the formulation of the problem in this study is:

- 1) What is the student's need for module of coordination system based on case-based learning?
- 2) How is the design of module of coordination system based on case-based learning?
- 3) What is the feasibility of module of coordination system based on case-based learning according to material, learning, and design experts?
- 4) What is the biology teacher's response to module of coordination system based on case-based learning?
- 5) What are the students' response to module of coordination system based on case-based learning?
- 6) How is the quality indicator of teaching effectiveness of module of coordination system based on case-based learning on students' critical thinking skills?

1.6. Research Objectives

The objectives to be achieved in this study are:

- 1) Knowing the student's need for module of coordination system based on case-based learning
- 2) Knowing the design of module of coordination system based on case-based learning.
- 3) Knowing the feasibility of module of coordination system based on case-based learning according to material, learning, and design experts.
- 4) Knowing biology teacher's response to module of coordination system based on case-based learning.
- 5) Knowing and students' responses to module of coordination system based on case-based learning.

- 6) Knowing the quality indicator of teaching effectiveness of module of coordination system based on case-based learning on students' critical thinking skills.

1.7. Research Benefits

The expected benefits after using module of coordination system based on case-based learning are:

- 1) For students, understanding the concept of coordination system material based on case-based learning.
- 2) For teachers, it can be used as teaching material in the coordination system material.
- 3) For schools, it can be used as a variety of teaching materials in the biology learning process to achieve learning objectives and can increase students' interest in biology subject schools.