

CHAPTER I

INTRODUCTION

1.1 Background

Increasingly tight human resources require education in Indonesia to be able to produce educated and qualified humans who can compete in facing challenges (Simanjuntak and Marpaung, 2018). One of the skills needed to face future challenges is higher-order thinking skills. Students must train their skills and foster their learning in order to outperform challenges, such as being skilled in higher-order thinking (Simatupang et al., 2022). There are four patterns of higher-order thinking which include critical thinking, problem solving, decision making, and creative thinking (Ongardwanich et al., 2015). Critical thinking is the foundation of the other three higher-order thinking patterns (Simanjuntak and Marpaung, 2018).

Student's critical thinking skills basically consist of questioning, hypothesizing, classification, observation and interpretation skills. According to Silitonga et al (2020) these skills are sometimes not well developed. An effective way to develop critical thinking skills is to stimulate students to be active in discussions in every lesson. This agrees with Reddingtong (2012) that teaching critical thinking is a continuous process in the sense that it must be included through various questions, lessons, and activities that focus on aspects of critical thinking skills. These aspects are focus, reason, inference, situation, clarity and overview. If students have mastered one of these indicators, it has led to the ability to think critically, even though it still does not fulfill all the skills that have been mentioned (Norrizqa, 2016).

Based on observations made at SMP Negeri 17 Medan, it is known that the main problem in learning science is the ability to think critically which is still rarely stimulated by teachers in the learning process. This is because the learning process tends to use conventional learning that makes students less active. The whole learning process is only centered on the teacher by dominantly using only the lecture method. During learning, students only listen to the teacher explaining the material without giving case examples related to the material being taught. Conventional learning makes students only as listeners in the learning process which makes students not trained to dig for information, express opinions on

scientific issues and find solutions. Conventional learning used by teachers is not in accordance with the challenges of the 21st century, namely skills in critical thinking and solving cases. The learning that is carried out also does not lead to contextual learning that is relevant to cases of everyday life so that students' abilities rarely practice their critical thinking skills in solving a case. This is in line with the opinion of Suhirman & Khotimah (2020) who stated that in general, the learning process at the junior and senior high school levels tends to use conventional learning such as lectures and assignments. The learning process is not directed to overcome cases and obtain solutions, even though it is known that science learning is full of cases in everyday life.

Learning that only focuses on the lecture method can affect students' low critical thinking skills. This is evidenced by the results of the critical thinking test in the form of an essay given to class IX students at SMP Negeri 17 Medan. The results obtained that the average score of students on the material of the human excretory system is 40. The results of this test indicate that students' critical thinking skills are still categorized as low. Critical thinking tests are used to measure students' critical thinking skills. The reason for using excretory system material is because it has previously been studied and the material is closely related to cases in everyday life. Science learning materials that are also related to cases and can stimulate students' critical thinking skills are the human reproductive system. This is because the reproductive system material is closely related to cases in everyday life such as diseases of the reproductive organs such as herpes, vaginal discharge, AIDS, and gonorrhea.

Teachers should review and improve teaching practices that have been implemented so far. One of them is by applying a model that can stimulate students to think critically such as a case-based learning model (Simatupang et al., 2022). Case-based learning is a constructivism learning model where problems are presented in case-based learning. Case based learning is often defined as a teaching model that requires students to actively participate in real or hypothetical problem situations, which reflect the types of experiences naturally experienced in the discipline being studied (Branch et al., 2014). The situation presented in case-based learning should be directly related to students' daily experiences, so that the

connection between case-based learning (CBL) and the usefulness in students' lives is evident (Syarafina et al., 2017).

Case-based learning is a model that uses real cases that have been well documented as a learning tool (Kulak and Newton, 2014). The real case is written in the form of questions and students integrate their learned knowledge to analyze, conclude, and finally solve the problem (Zhao et al., 2020). Students must explore and find the case and solution of the given case under the direction of the teacher in a discussion activity. The advantages of case-based learning according to Trianto (2011) are; (1) Students can reveal cases or issues and use cases that they relate to new situations. (2) Students can develop analysis, collaboration, and communication skills. (3) Students are more involved in the learning process. (4) Case-based learning can develop students' skills in collaboration, speaking, and critical thinking. The syntax of case-based learning is carried out with several steps, namely determining the case, analyzing the case, collecting data, determining the solution steps, conclusions and presenting the results (Dayu et al., 2022).

Case-based learning provides an opportunity to analyze cases if learners have prior knowledge of the problem presented. Cases are problem scenarios that are realistic and relevant to the part of the material being studied. Cases that appear in learning contain problems related to the environment, conditions, situations, or the future picture of students (Syarafina et al., 2017). Case-based learning involves students to learn by using realistic narratives, these narratives provide opportunities for students to integrate many sources of information in an authentic context (Yadaf et al., 2007). The advantages of using narratives in case-based learning are 1) stories can be used as a copy of the concept, theoretical basis taught, and rich in examples related to the memory of students' understanding; 2) stories can be used as examples of cases that students must find solutions to and become a good learning strategy; and 3) stories can be a forum for student reflection to measure their ability to understand a case (Syarafina et al., 2017).

Based on research conducted by Arum (2014) that case-based learning is effectively applied to improve critical thinking skills in chemistry learning. Further research conducted by Andayani et al (2022) showed that the implementation of case-based learning is one of the appropriate models and is clearly able to provide

opportunities to improve student skills, namely Creativity Skills, Critical Thinking Skills, Communication Skills, and Collaboration Skills (4Cs). Further research was also conducted by Yadaf et al (2009) that the case-based learning model contributes to improving critical thinking skills; can make better connections in content areas; have an understanding of the application of the concepts learned; and are better able to see problems from various perspectives.

These studies indicate that case-based learning contributes to critical thinking skills. This is because the answer to a given case is not simple or explicit; instead, it provokes students' critical thinking to interpret meaning, analyze problems, assess statements, formulate conjectures and present arguments by using theoretical concepts to highlight the problem under study. The CBL model can train students' critical thinking skills because the cases presented make students have to think more deeply (Nadershahi et al., 2013). The case presented includes complex problems that require careful analysis and collecting the right information on the problem so that students know the meaning of the problem. Pilz and Zenner (2018) investigated the use of CBL models can help promote complex thinking in science education. Thus forming a more meaningful learning unit. Based on the explanation above, this research needs to be done to determine students' critical thinking skills with the implementation of case-based learning on human reproductive system material.

1.2 Problem Identification

Based on the descriptions in the background above, there are several problems that can be identified, among others, as follows:

- 1) The learning process tends to use conventional learning such as lectures and assignments.
- 2) The teacher has never given case examples related to the material taught and the lack of group discussion activities.
- 3) The teacher does not stimulate students' critical thinking skills
- 4) Students' critical thinking skills are still categorized as low

1.3 Scope

The scope of this research is the critical thinking ability of students with the implementation of case based learning on the material of human reproductive

system class IX at SMP Negeri 17 Medan. The object of this research is class IX students consisting of 2 classes totaling 58 people. This research was conducted in the odd semester of the 2023/2024 school year. The determination of time will be adjusted to the school academic calendar. The ability measured is the critical thinking ability of students using Ennis' theory which consists of indicators of focus, reason, inference, situation, clarity, and overview.

1.4 Problem Limitation

The limitations of the problem in this research are:

- 1) The application in question is the application of the case based learning (CBL) learning model to human reproductive system material based on the syntax of CBL
- 2) The material studied is the human reproductive system in class IX at SMP Negeri 17 Medan using the 2013 curriculum
- 3) The ability measured is critical thinking ability according to Ennis' theory with indicators of focus, reason, inference, situation, clarity, and overview.
- 4) The implementation in question is the implementation of the syntax of the case based learning model
- 5) Critical thinking abilities were compared between classes using case based learning and conventional using hypothesis testing.
- 6) Increased critical thinking skills are obtained by calculating N-Gain

1.5 Problem Formulation

The problem formulations in this study are:

- 1) How is the case based learning model applied to class IX human reproductive system material at SMP Negeri 17 Medan?
- 2) How does the syntax of the case based learning model apply to human reproductive system material?
- 3) What is the critical thinking ability of students regarding the human reproductive system in class IX by applying the case based learning model at SMP Negeri 17 Medan?
- 4) How do students' critical thinking skills improve on human reproductive system material in classes that use conventional case based learning at SMP Negeri 17 Medan?

1.6 Research Objectives

The objectives of this research are:

- 1) To find out the application of the case based learning model for class IX human reproductive system material at SMP Negeri 17 Medan.
- 2) To determine the implementation of the case based learning model syntax on human reproductive system material
- 3) To determine the value of students' critical thinking skills in class IX human reproductive system material by applying the case based learning model at SMP Negeri 17 Medan
- 4) To determine the increase in students' critical thinking skills on human reproductive system material at SMP Negeri 17 Medan.

1.7 Research Benefits

In accordance with the above research objectives, the expected research results will provide the following benefits:

- 1) For science teachers, as an alternative to make variations in teaching by using case-based learning models and providing input in carrying out the learning process so that the quality of learning is better.
- 2) For students, it is expected to improve critical thinking skills through the application of the case-based learning model.
- 3) For schools, it is useful for making the right decisions in improving the quality of teaching and being taken into consideration in making policies for science learning innovation at school.
- 4) For researchers, it can gain direct experience in applying the case-based learning model and as a provision for researchers as prospective science teachers in undergoing teaching practices in real formal institutions.
- 5) For other researchers, this research can be used as a consideration for researchers and readers who are interested in studying more deeply about the application of case-based learning models to critical thinking skills.