CHAPTER I
INTRODUCTION

1.1 Background of the Study

The 21st century requires individuals to possess a variety of skills in order to compete in the face of increasingly rapid change. These skills include critical thinking, problem-solving, and communication. The National Education Association has identified these skills as 'The 4Cs': critical thinking, creativity, communication, and collaboration (Rhedhana, 2019). The implementation of education can support students in mastering the various skills needed to meet these skill demands (Septiani *et al*., 2019).

One necessary skill is critical thinking. Rahman (2019) argues that learners require problem-solving skills that involve critical thinking processes as the core of 21st-century learning. Critical thinking skills enable students to ask questions and provide criticism about the information they want to know, making them more active learners (Saleh, 2019). Zubaidah (2017) states that critical thinking skills are high- level thinking process skills that play a crucial role in developing moral, social, mental, cognitive, and scientific development skills.

According to Hutman *et al.* (2021), many students currently lack critical thinking skills. The results of the Trends in International Mathematics and Science Study (TIMSS) indicate that Indonesian students struggle with solving questions that require contextual, demanding reasoning, argumentation, and creativity. According to Gustia's research (2021), Indonesia received a score of 396 in the science category, ranking 80th out of 88 countries. The Trends in International Mathematics and Science Study (TIMSS, 2015) in the biology section, Indonesian students received only 46 percent correct scores, ranking Indonesia 46 out of 51 countries. Additionally, according to a study conducted in November 2021 at Class X SMA Labschool Unesa, students' critical thinking skills were found to be at a very low level (Ma'rufah 2023).

The initial observation of the research was conducted by giving a test in the form of multiplechoice questions with critical thinking indicators. The test was distributed to 32 students of class XI IPA SMA Unggulan Al-Manar. The results of the initial observation showed that the percentage of critical thinking skills of students in class XI IPA was very low. In addition, observations made in class XI IPA show that teachers rely only on textbooks as a learning resource and have not used innovative learning media.

The implementation of Curriculum 2013 is closely related to the scientific approach learning method (Elvianasti *et al.,* 2022). The purpose of learning with this method is to enhance students' critical thinking skills, enabling them to solve problems, analyze data and information from various sources, ask questions, and communicate effectively with others (Kusumah, 2019). Additionally, previous research has shown that each stage of learning with a scientific approach assists students in practicing critical thinking skills. Ma'rufah (2023) reported in her research that all learning activities related to biology material that referred to the stages of scientific approach helped students practice critical thinking skills. These stages included interpretation, analysis, and explanation, and were highly rated.

According to Liana (2020), the scientific stages can help develop critical thinking skills by providing a learning experience that achieves every indicator of critical thinking. The process of observing and questioning helps students build basic skills and train them to provide simple explanations. Additionally, gathering information and reasoning aids students in providing advanced clarification and making inferences. Similarly, the communication phase helps students develop strategies and tactics for post-learning activities and interactions. This demonstrates the practicality of using a scientific approach to train critical thinking skills in learning activities.

Students require critical thinking skills in the learning process, particularly in biology. This is due to the analytical, inductive, and deductive thinking skills required to solve problems related to natural events (Mustajab, 2018). Irawan (2023) argues that biology has specific material characteristics that distinguish it from other fields of science, such as the digestive system. This material may be challenging for some students as it requires an understanding of various processes

related to its structure and function. According to the Basic Competencies (KD) outlined in the 2013 curriculum, students must be able to analyze the relationship between the tissues that make up the digestive system's organs and their role in nutrition, bioprocesses, and functional disorders. According to Nawawi's (2022) study, students' critical thinking skills on the topic of the human digestive system were categorized as very low, with only 23.83% demonstrating proficiency. The study aimed to improve students' critical thinking skills and learning quality by focusing on this topic.

The use of suitable teaching materials is a crucial factor in enhancing students' comprehension and retention of learning materials (Korniawati *et al.,* 2016). Developing teaching materials based on the scientific approach is an innovative way to cultivate students' critical thinking skills. According to Ma'rufah (2023), Student Worksheet can be developed as a teaching material to enhance critical thinking skills using a scientific approach. Student Worksheet can assist students in comprehending concepts through theory, investigation, or demonstration, while also providing procedures or work instructions to complete tasks in accordance with the learning indicators to be achieved (Firdaus & Wilujeng, 2018).

Support and utilize 21st-century technology in Industry 4.0, student worksheet forms have been changed to student e-worksheet. Electronic student worksheets can be operated with various electronic devices, making them practical and easily accessible to students. The use of student e-worksheet in the learning process is expected to provide opportunities for students to actively participate in their learning. Furthermore, the student e-worksheet facilitates students' comprehension of learning materials beyond fundamental knowledge. Ma'rufah's (2023) scientific research on student e-worksheet produced valid and effective results. The critical thinking test revealed that 80% of students met the criteria for interpretation, 73.33% for analysis, and 86.67% for explanation. Moreover, 95.10% of students responded positively (Very good).

The study utilizes the Canva application to create electronic student worksheets. According to Melinda's (2021) research, Canva is an editor application that teachers can use to innovate learning and facilitate technology-based learning,

skills, creativity, and student engagement in the learning process. According to Firmansyah's (2023) research, Canva-based student worksheets facilitate various learning modes, or learning style preferences, to create a more favorable learning environment for students. The application of Canva-based digital student worksheet in learning implementation has received positive responses from students, with over 89% rating it as good or very good. This indicates that students have a strong interest in utilizing Canva-based student worksheets as a learning tool in the classroom.

Based on this description, it is suggested that a student e-worksheet based on a scientific approach with the help of the Canva application can be used to improve the critical thinking skills of students on the material of the digestive system. The aim of this study is to develop a Canva-based student e-worksheet with a scientific approach to the material of the digestive system, and to assess its validity, practicality, and effectiveness in improving the critical thinking skills of class XI SMA/MA students. The purpose of this research is to create a student e-worksheet that enhances students' critical thinking abilities in comprehending and mastering the concept of the digestive system through a scientific-based learning experience.

1.2 Problem Identification

Based on the background described, several problems can be identified:

1. Student worksheets require an approach in school learning activities to improve critical thinking skills, for example the scientific approach.
2. The student worksheets utilized at SMA Unggulan Al-Manar do not meet the criteria for creating effective and accurate student worksheets in accordance with the 2013 Curriculum.
3. SMA Unggulan Al-Manar has not yet utilized electronic student worksheets, particularly Canva-based student worksheets.
4. The teacher's teaching materials consist solely of question sheets from the handbook.

1.3 Scope of Study

The scope of the study is limited to these aspects. The study will focus on gathering responses from media experts, material experts, learning experts, biology teachers, and students to evaluate the effectiveness of the developed student worksheet electronic.

1.4 Scope of Problem

Based on the background and problems identified, this study has identified certain limitations:

1. The student e-worksheet developed only covers the material on the digestive system for class XI semester II.
2. The student e-worksheet developed is a scientifically-oriented e-worksheet.
3. The 4D model is used for the development of this research.
4. The study will take place at SMA Unggulan Al-Manar
5. The obtained critical thinking skills demonstrate the student's competence in the digestive system material, as evidenced by the results of the Pretest and Posttest.

1.5 Problem Statement

Based on the background and problem identification, this study aims to formulate the problem as follows:

1. Is the electronic student worksheet based on the scientific approach with Canva feasible and practical to use based on the experts' assessment?
2. Is the electronic student worksheet based on the scientific approach with Canva effective in developing students' critical thinking skills?

1.6 Research Objectives

The research objectives are as follows, based on the problem formulation:

1. Producing electronic student worksheets based on scientific approach with canva that are feasible and practical to use in learning biology on digestive system material based on experts' assessment.
2. Knowing the effectiveness of electronic student worksheets based on a

scientific approach with canva in developing students' critical thinking skills.

1.7 Research Benefits

The benefits that will be obtained from this research based on the research objectives are:

1. For Students

   The results of the research in the form of student e-worksheets with a scientific approach are expected to be used by students to practice critical thinking skills and as an alternative in using quality and interesting learning media.

2. For Teachers

   The research has resulted in the development of a student e-worksheet with a scientific approach to assist teachers in teaching biology on the topic of digestion system for Class XI SMA/MA.

3. For Researchers

   The results of this study are expected to add insight, knowledge and experience related to student e-worksheet, so that they can be applied and utilized after becoming a teacher in the future.