

CHAPTER 1

INTRODUCTION

This chapter provides an overview of the study consisting of background of the study, research questions, purpose of the study, and significance of the study. Providing the prior knowledge of the topic, the background of the study exposes why the integration of scientific literacy in English learning in a vocational school setting is important. Following the background, the researcher depicted the questions and the purpose of the study that would be investigated later on. Finally, this chapter ended with who will get the benefits of this study which consisted of school, English teacher, and future generations.

1.1 Background of The Study

Globally, rapid advances in science, technology, and digital information have transformed the way people live, work, and make decisions (Hikmat, 2024). Rego et al (2025) stated that these rapid changes require individuals, especially younger generations, to develop competencies that enable them to adapt to the demands of the society. Therefore, education is expected not only to provide students with academic knowledge but also to equip them with the skills and competencies necessary to navigate complex real-world challenges.

Among the various competencies required to respond to the demands of today's society, scientific literacy has become one of the most essential. According to DeBoer (2000), scientific literacy enables individuals to apply scientific understanding in their interactions and participation in society rather than merely acquiring scientific knowledge. As scientific and technological developments continue to move forward, individuals are expected to evaluate information critically and make informed decisions based on evidence. In line with this, Okada (2013) stated that scientific literacy enables individuals to keep pace with rapid scientific and technological developments. Similarly, Wahyuni, Firdaus, and Silfianah (2024) emphasized that scientific literacy is essential for developing analytical reasoning, problem-solving, and information evaluation skills. Therefore, scientific literacy is seen as a

fundamental tool to support individuals to participate effectively in society. Accordingly, enhancing scientific literacy has become an important educational goal as schools are expected to prepare students with certain competencies that enable them to address real life challenges and equip them to contribute meaningfully to the society.

Considering the importance of literacy in preparing students for the society demands, the Ministry of Education, Culture, Research and Technology launched the *School Literacy Movement* also known as *Gerakan Literasi Sekolah (GLS)* in purpose to enhance the students' literacy skills. However, society's demands to younger generations are beyond the basic literacy skills. As the development of science, technology, and digital information, students are expected to acquire scientific literacy skills that help them to critically evaluate information and actively participate in society. Alwi et al (2024) stated that this situation can be seen from Indonesia's educational policy in Merdeka Curriculum that start to develop higher-order thinking skills, critical thinking, and problem-solving as core competencies that they need to learn. Thus, teachers are expected to masters these competencies in order to deliver it thoroughly and meaningfully to students.

The Organisation for Economic Co-operation and Development (OECD), through Programme for International Students Assessment (PISA), conducts an international assessment to evaluate the competencies of 15-year-old students in three fields which are reading, mathematics, and science. Unlike conventional school examinations that primarily assess students' mastery of subject content, the science in PISA is designed to measure students' scientific literacy. OECD (2023) refers scientific literacy to students' ability to explain scientific phenomena, evaluate and design scientific inquiry, and interpret scientific evidence to make informed decisions in real-life contexts. Therefore, the result of this science assessment reflects students' level of scientific literacy rather than checking students' knowledge of science. The results of PISA indicate that Indonesian students tend to have lower performance in scientific literacy. In PISA 2018, Indonesia obtained scores of 371 in reading, 379 in mathematics, and 396 in science. In PISA 2022, these scores declined to 359 in

reading, 366 in mathematics, and 383 in science (OECD, 2023). Since the science assessment in PISA is based on the concept of scientific literacy, the decrease in Indonesia's science score suggests that many Indonesian students still experience difficulties in applying scientific knowledge and reasoning to solve problems and make evidence-based decisions in everyday situation. These findings highlight the urgent need to strengthen scientific literacy through educational practices across disciplines, including English learning.

Several previous studies have examined the implementation of scientific literacy from different perspectives, including classroom practices, learning materials, teacher preparation, and instructional support. For example, Pertiwi et al. (2023) investigated the implementation of scientific literacy in two public primary schools in Gumawang, East Ogan Komering Ulu (OKU). The study found that teachers used inquiry- and experience-based learning. However, teachers still needed more training, better learning facilities, and more opportunities for students to explore ideas independently. Similarly, Holila and Manalu (2024) analysed scientific literacy in senior high school biology textbooks using Chiappetta's (1991) framework. They found that the *knowledge of science* aspect appeared most often, while the other aspects were less represented, showing that scientific literacy was not integrated in a balanced way.

Other studies have focused on helping teachers apply scientific literacy in the classroom. Prasetyo, Syawaluddin, and Desstya (2024) pointed out the need for practical guidance to help teachers include scientific literacy in their teaching. Muyassyaroh et al. (2024) also found that digital platforms, such as Literacy Cloud and PhET Colorado, helped teachers understand scientific literacy and made learning more interactive. In addition, Dewi et al. (2022) reported that professional development programmes improved teachers' ability and confidence to design science-literacy-based learning materials.

Although these studies provide useful information about scientific literacy, most of them were conducted in science subjects and primary or secondary

science classrooms. As a result, there is still limited information about how scientific literacy is applied in English as a Foreign Language (EFL) classrooms, especially in vocational high schools. English classes have different learning goals and teaching activities from science classes, so the findings from previous studies cannot fully explain how scientific literacy is used in EFL learning. This shows the need for more research on the implementation of scientific literacy in vocational EFL classrooms. Therefore, this study aims to investigate how scientific literacy is applied in English classes at a vocational high school and to identify the aspects of scientific literacy that appear during the teaching and learning process.

1.2 Research Questions

Relating to the background and purposes, here are the questions the researcher will figure out in this study:

1. How does the teacher implement scientific literacy in the English learning in vocational school setting?
2. What is the most prominent aspect of scientific literacy that occurs along the learning?

1.3 Purposes of The Study

Due to the low score of Indonesia's literacy in PISA, it is our job as an educator to guide the next generations to be a scientifically literate person. In this research, the researcher would like to investigate the scientific literacy awareness raised by the teacher in English learning in a vocational school. The researcher limits the study to inspect what aspects fit with the indicators. To reach the target, the researcher examines the learning process including the activities or materials used in the learning.

1.4 Scope of The Study

This study mainly focuses on the integration of scientific literacy in English teaching at a vocational school. Particularly, the study investigates how scientific literacy is integrated into English classroom activities. The research

is limited to the teacher's strategies in teaching English and the manifestation of scientific literacy during the teaching and learning process.

Furthermore, this study is conducted in one vocational school and involves and English teacher as the main subject. The study does not investigate how the students' understandings toward the materials, effectiveness of the strategy, or the improvement of students' scientific literacy skills. Hence, it emphasizes describing and exploring the implementation of scientific literacy in the English classroom context.

1.5 Significance of The Study

- a. To school, this study could help them to be more aware of science literacy
- b. To teacher, this study would help to learn deeper of scientific literacy and understand the connection with English learning
- c. To the future generations, this study would help them to be aware of the scientific literacy and how it influences our life.

