

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

5.1 Conclusion

According to the research question and the research finding that has been conducted, it can be concluded as follows

- 1) The student learning process of design thinking approach implementation runs based on what has been designed in the lesson plan by involving 7th-grade students in the learning process in studying environmental pollution. In its implementation, the learning process uses zoom meetings and google classroom to be covered all of the stages of design thinking, but in online learning, the researcher feels the enthusiasm of students in learning is less so that not all students contribute to learning due to many obstacles. To make sure the stage of design thinking covers in teaching-learning process, the researcher uses a worksheet that has been validated. The worksheet must be filled by the student from the beginning in the empathy stage until the end of the learning process in the stage prototype. Students have to visualize their project through a prototype and choose the most appropriate solution for their environmental problem.
- 2) The design thinking approach can improve students' Problem-Solving skills in studying environmental pollution. There is a difference between students' Problem-Solving skills before and after the implementation Design Thinking Approach in learning environmental pollution topics. It can be said that H_0 is rejected and H_1 is accepted. The enhancement is considered as a medium enhancement because obtained the normalized gain or N-Gain score is 0.391. For each aspect of Problem-Solving skills, understanding the problem, planning for Problem-Solving, and reviewing the solution aspects have medium improvement with the score of N-Gain shows as 0.33, 0.59, and 0.61. While the other aspect such as Implementation for Problem-Solving, the N-Gain score is categorized as high with the score of 0.83.

- 3) The design thinking approach as a new learning strategy for students has provided an excellent learning experience for students. In addition to the design thinking approach, it can provide meaningful learning for students, it can also improve 21st-century abilities, one of that is Problem-Solving skills and creativity. Students can also increase their sensitivity or empathy to environmental problems, although student responses and participation in learning are lacking because learning is carried out online. The lack of student participation causes group communication and group problems to become one of the problems that are quite influential in the continuity of the teaching and learning process.

5.2 Implications

Based on the result of the research, the implications can be inferred theoretically and practically as follows:

1) Theoretical Implications

- a. The use of the appropriate learning approach could affect students' ability to solve problems. In science learning on the topic of environmental pollution, there are differences between students' problem solving skills before and after using the design thinking approach in learning process.
- b. The increasing of students' solving abilities is at the medium level because not all students are actively involved, especially in online learning conditions, only some students follow to the end. To achieve maximum results, it is expected that there will be collaboration between teachers and students to create a comfortable learning atmosphere and follow all stages of learning in accordance with the applied approach.

2) Practical Implications

The results of this study are used as input for teachers and prospective teachers to create a comfortable learning atmosphere and also apply an approach that is in accordance with the learning objectives to be achieved so that students are able to improve 21st century skills.

5.3 Recommendation

Based on the research findings and the conclusions that have been presented, the researcher proposes several recommendations that are considered useful to improve pedagogical competence in the future, as follows:

- 1) **Another Researcher**, the design thinking approach is a new thing that is applied in education, but it does not mean that the design thinking approach cannot be developed in education, especially in the teaching-learning process. This study can be used as a reference for other relevant research moreover in design thinking and Problem-Solving skills. In this study, the most striking problem is regarding the lack of enthusiasm, participation of students, and limited time as well, therefore the researcher suggests for further researchers to finalize the group concept and also make design thinking an interesting approach so that they can make finished products so that students are interested and fully contribute to learning.
- 2) **Teacher**, the rapid development of communication and information technology requires educators to be more innovative in building a learning atmosphere so that students do not get bored quickly. In addition, the digitalization of education makes teachers have to be versatile so that their role cannot be replaced. Design thinking is a learning strategy that can be used by teachers to make teaching and learning activities more innovative and in the process of implementing it using technology to make it more interactive as well as training students to switch to digital through this design thinking approach.