

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Based on the discussion, result, and analysis of previous chapters, the researcher summed up several conclusions. First, the implementation of STEM-based learning in learning environmental pollution has an impact on students' problem-solving skills. It can be proven by the N-gain result that shows there is a low improvement between the pre-test and post-test of the treatment given. The result indicates that is not effective to measure problem-solving skill through the implementation of STEM learning by online. The average N-gain of the experiment is 0,306. In addition, from the hypothesis test, it is proven that H_0 rejected and H_1 accepted, meaning that there is a significant difference between the pre-test and post-test. This means, there is a significant improvement in students' problem-solving skills through the application of STEM-based learning. The improvement is due to step-by-step learning that can improve students' ability to think about how to solve problems. As it allows students to learn more from a space of unequal issues which will decide what knowledge and skills are required and how well knowledge and skills are to be acquired during the implementation of STEM-based learning.

Secondly, the implementation of STEM-based learning also has an impact on students' science self-efficacy. The pre-test and post-test results have shown the low improvement which can be proven by the N-gain result. The average N-gain after the treatment was given for about 0,212. Furthermore, the improvement of students' science self-efficacy is also supported by the acceptance of H_1 which means that there is a significant improvement in students' understanding of science self-efficacy through the activity during the implementation of STEM-based learning. This happens because in STEM learning activities teachers have to ascertain a suitable design for project activities which can lead to a sense of desire to research, resolve problems and encourage students to have confidence in themselves to deal with the problems with different strategies between each student. Meanwhile, the responses from students also change along with the experiences they get in STEM learning, especially for the practical work aspect.

5.2 Recommendation

Based on the findings of this research, several recommendations can be used as future references for other researchers. The first recommendation is necessary for students to work in a pair or group for better results rather than work individually. But first, students need to analyze students' abilities. So the students' distribution may be consist both of low achievement and high achievement of working collaboratively.

Secondly, in terms of applying online learning, the teacher should make sure well that students have actively learned. If online learning is not effective for monitoring the activities of students, better to ask them to create a video during the learning process. Moreover, the teacher may have coordination with the parents or other people who are in the students' house to monitor students' progress.

The third recommendation would be for the teacher to understand more thoroughly what students need and what kind of instruction need also the learning method needs to be delivered to apply STEM-based learning particularly on the learning that is carried out online. To obtain better data and results also the most important thing is students' understanding of any subject. The fourth recommendation is to include a variety of samples instead of just investigate students' abilities in general. This would result in more variation of data and more discussion of various aspects.

The fifth recommendation is to investigate the application of STEM-based learning in other subjects and variables to deepen our understanding of the impact of STEM-based learning itself in different results.