CHAPTER V

CONCLUSION, IMPLICATION, AND RECOMMENDATION

5.1 Conclusion

This research was conducted in the seventh grade of a private junior high school in Bandung that uses the National Curriculum. The method of this research is a quasi-experimental method that compares between experimental class and control class, with a pre-post-test design. Students' computational thinking was measured. Several conclusion that answered the research questions described as follows:

1) Students' computational thinking in experimental class, which was treated by digital mind mapping, gained a better enhancement than control class that was treated by the paper mind map. Experimental class got a large size effect of enhancement, meanwhile control class got a medium-size effect. From four aspects of computational thinking (decomposition, abstraction, pattern recognition, and algorithm), decomposition is the most improved aspect among experimental class and control class. Overall, it indicates that digital mind mapping gave a better computational thinking outcome to the students.

2) Students' mind map scores between experimental class and control class have no considerable difference. After the score was converted into a percentage, the average level of percentage for both of the classes is on average level. Content and organization components got the highest average score that is gained from the digital mind map created by the experimental class, meanwhile, content and connection components got the highest average score that is gained from the paper mind map created by the control class.

3) From the hypothesis test, it can be concluded that there is a significant difference in students' computational thinking in learning global warming between experimental class and control class. Also, there is a weak, positive, and non-significant correlation between students' digital and mind map score and students' computational thinking score.

5.2 Implication

Based on the result and discussion on the use of digital mind map to enhance students' computational thinking, it was showed that:

1) Students in experimental class gained a large size effect of enhancement from computational thinking pretest to posttest on global warming. Their improvement was also found to be significant compared to the control class. It means that digital mind map can be used to enhance students' computational thinking.

2) Both students' digital mind map and students' paper mind map scores were still on average level. Those two classes also have different highest improved mind mapping components. It means that the lack of mind mapping component introductory on both of the classes is still low so that the students focused on the computational thinking rules rather than the mind mapping rubric.

5.3 Recommendation

Based on the research that has been concluded, there are several recommendation for students, teachers, and other researchers, especially in developing digital mind mapping method and computational thinking:

1) For the Students

As computational thinking become one of the important skill in the 21st century, students are expected to master the skill so that they could adapt and compete globally. Based on this research, digital mind mapping could help students to train their problem-solving and computational thinking skills.

2) For the Teachers

Digital mind mapping can be considered to be one of the impactful methods in supporting teaching and learning process, especially in a topic that requires problem-solving skills. Digital mind mapping can also be used in the way to enhance students' computational thinking online learning environment.

3) For other Researchers

The results and analysis of this study are expected to be a piece of basic knowledge for another upcoming research regarding the improvement of the study on digital mind mapping and computational thinking in science

learning. This study can be a reference for relevant research. The researcher recommends creating and consider a merged mind mapping and computational thinking rubric for further research.