

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1. Conclusion

Research of STEM learning on electricity using PhET-Arduino based experiment to improve 8<sup>th</sup> grade students' STEM literacy has been conducted, based on the research result it is obtained some conclusions as follows:

1. The implementation of STEM learning as the approach to learn electricity topic can improve students' STEM literacy. It can be noticed from the result of the STEM test instrument. Gain score between pre-test and post-test is 0,16 which include as low category.
2. The Implementation of STEM learning in the worksheet can support the STEM learning activity to improve students' STEM literacy.
3. Improvement of STEM literacy can be seen on the score  $\langle \bar{g} \rangle$  in every aspect. Scientific literacy  $\langle \bar{g} \rangle$  score 0,23 , technology literacy  $\langle \bar{g} \rangle$  score 0,42 , Mathematic literacy  $\langle \bar{g} \rangle$  score 0,25. Scientific, technology and mathematical literacy improved and categoriez into low improvement. While engineering literacy which has 0 point for  $\langle \bar{g} \rangle$  score mean that's no improvement.

#### 5.2. Recommendation

Based on the research that has been conducted and concluded, there are several recommendation that necessary to be improved by the researchers :

1. STEM learning can be implemented as approach in learning electricity in the 8th grade students to improve students STEM literacy.
2. In order to give students enough time to learn and explore their knowledge and creativity in design by using the media, time management conducting STEM learning and test should be separated.
3. Teacher should be the one who determine the group division in every week. Teacher can make sure that in one group, the composition of students is balance in every group.

4. In the end of the project it's better if students can presentate their project to another.
5. In order to get more higher improvement of STEM literacy, it's better if the meeting conducted more than 3 meeting.
6. Because students engineering literacy still no improvement, for the future research, we recommend to do the research on STEM literacy to improve students engineering literacy.