CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The implementation of STEM learning on electricity can improve students’ STEM literacy. It can be noticed by analyzing the average normalized gain of final score the between pretest and posttest. The research has improve students’ STEM literacy by 0.07 categorized as low improvement. Based on the research result it obtained some conclusions as follows:

1. The lesson plan is applied on three meetings, which activities are: conducting Protoboard experiment as the introduction to the electrical circuit, constructing series and parallel circuit using YWRobot, and constructing traffic light circuit using Arduino. The implementation shows that students are able to construct series and parallel circuit using Protoboard, YWRobot, Arduino, and electrical components.

2. STEM worksheet is designed to guide students in conducting activities and applied on three meetings, which are: conducting Protoboard experiment as the introduction to the electrical circuit, constructing series and parallel circuit using YWRobot, and constructing traffic light circuit using Arduino. The worksheet of STEM learning is adequately able to engage students’ response in medium level (46.25%). This result means that the characteristics of questions, the guideline, and teacher’s teaching style adequately enough to strengthen students’ concept in electricity using STEM Learning.

3. There is no significant improvement on students’ STEM literacy after implementing STEM Learning on electricity. However, the normalized gain of pretest and posttest score shows improvement in students’ technology literacy,
students’ engineering literacy, and students’ mathematics literacy while it shows negative improvement in students’ science literacy. It can be noticed by processing students’ normalized gain for each aspects by 0.22, 0.12, 0.03, and -0.02. The improvement obtained by focusing on technology and engineering activities rather than giving the science concept.

5.2 **Recommendations**

Based on the findings of the research that has been conducted and concluded, there are several recommendations that necessary to be conducted by the researchers, some of them are:

1. At assign students’ working group, the teacher should be able to know the characteristic of students. The teacher should give attention as motivational factors and gives intensive learning process.
2. The research instrument should be completed by students interview and questionnaire to gain students’ experience in STEM learning.
3. The research duration should be conducted in longer period to gain the students’ engagement on electricity concept and technology.
4. In order to obtain better result on STEM Learning implementation, the researcher should conducting interview the subject teacher to know his/her opinion and be able to develop the instruction.
5. To other researcher who also have same interest to implement STEM learning, it is recommended to conduct the research with advance physics educator to sharpening students’ concept.
REFERENCES


Kallin Patridhina Manika, 2017

*STEM LEARNING ON ELECTRICITY USING ARDUINO-PROTOBOARD EXPERIMENT TO IMPROVE 8TH GRADE STUDENTS’ STEM LITERACY*

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