

## **CHAPTER V**

### **CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS**

#### **5.1 Conclusion**

This study presents an explanation of the creative thinking skills of junior high school, senior high school, and vocational high school students through STEM learning applied in robotics activities by reviewing how student's creative thinking skills in generating product design ideas, including how well the students' creative thinking performances are as well as student's responses to STEM learning. In answering the predetermined problem formulation, data processing was carried out through creative thinking assessment rubrics, observation sheets, and questionnaires, and then the data were analyzed descriptively quantitatively. After the analysis is complete, it can be concluded several things, including:

1. The assessment of student's creative thinking skills has shown good results. In this case, the assessment of creative thinking skills is divided into 3 categories, namely generating diverse ideas, generating creative ideas, and evaluating/improving ideas. The results showed that the junior high school and senior high school student groups were in the proficient category, while the vocational high school student group was in the advanced category. The category of evaluating/improving ideas is the category that has the highest value compared to others.
2. The students' creative thinking process, reviewed through creative thinking criteria, has shown good results. The results showed that the junior high school and senior high school student groups were included in the good category, while the vocational high school student groups were included in the excellent category. The fluency aspect in the creative thinking criteria has the highest score compared to others, and the originality aspect has the lowest score compared to others.
3. Students' responses to STEM learning showed good results, indicated by the percentage of questionnaire scores obtained of 73.14%. Student's interest in learning has a good effect on students' views on STEM. STEM-based robotics activities at the secondary education level for junior high school, senior high

school and vocational high school students can provide a conducive learning environment that fosters and hones students' creative thinking skills.

## **5.2 Implications**

The implications obtained from the results of the research that has been done are:

1. This study provides an overview of the creative thinking skills of junior high school, senior high school, and vocational high school students in STEM-based Robotics activities.
2. The findings in this study can help other researchers better understand the effect of STEM applied in learning, especially related to student's creative thinking skills.
3. This research can be a reference for educators interested in applying the STEM approach to learning.

## **5.3 Recommendations**

Based on the research that has been conducted, the following are some recommendations for further research, including:

1. Can provide a more detailed explanation of the improvement in a student's creative thinking skills before and after the study.
2. Can capture the comparison of creative thinking skills of junior high school, high school, and vocational school students more deeply by considering other factors in the study.