# CHAPTER V
# CONCLUSION, IMPLICATION, AND RECOMMENDATION

## 5.1 Conclusion

From the results and discussion, two points need to be underlined. These two points happen in both groups of students who have learnt Light and Optic Topics and students who have not. The first point is that in general, there is no significant difference between students who have learnt the light and optic topics and those who have not. Both groups of students have more misconceptions than scientific knowledge. Among the four subtopics, both groups of students did best in the formation of images on mirrors subtopic and did worst in the optical instruments subtopic. The reason for it is student's unfamiliarity with light and optic topics. During online learning, students don't get practices, experiments, or hands-on activity as much as they should if the learning was conducted offline. Students also lost their access to the school laboratory equipment. Because of that reason, there is little difference between students who have learnt the topics and those who have not.

The second point that can be concluded from this research is that students have more than 50% misconception on questions 3, 10, 18, and 19. Those are about the moon as a secondary source of light, the number of images in hinged mirrors, and microscope. There are various reasons for it like unconfronted misconception, online learning, and unfamiliarity. Unconfronted misconceptions might stay or even causing more misconception. Online learning also causing more misconception compared to offline teaching. The same happens for unfamiliarity. When students are unfamiliar with objects or particular situations, it leads to misconception. The three reasons above might be resulted by the online learning that Indonesian does during the pandemic. Students don't get immediate feedback from teachers during online learning. It is added by the fact that teachers have less time to deliver the topics so they have no time to discuss the common misconceptions related to this topic in class causing unconfronted misconceptions. Online learning also causes students to lose their chance to get familiar with hinged mirrors and microscopes.

## 5.2 Implication

The results of this research have several implications. It implies that the lesson at school needs to be improved to help students build scientific knowledge and eliminate misconceptions in light and optic topics, especially on the optical instruments subtopic. It also implies that discussing common misconceptions related to the topic in class and having hands-on activities are essential for students. That will help them build their scientific knowledge from what they already know. That will also prevent or counter any misconception that they might develop. Students need experiments, practices, and explanations on how the concepts work in real life.

## 5.3 Recommendation

There are several recommendations from this research. The first is that it teacher should identify students' conception before class. It is done to map students' conception so that teachers can plan the lesson to accommodate students' needs. However, when teachers have limited time they can find out the common misconceptions from the previous researches. The second is teachers need to emphasize common misconceptions in class. This is to reinforce students' scientific knowledge, prevent misconceptions, and eliminate misconceptions.

The third is for teachers to facilitate students with hands-on activities. When students have hands-on activities they will have more meaningful experiences and they will be more familiar with the topics. Students will have a better understanding of how the concept works in real life. Hands-on activities can also facilitate conceptual change so students have a better conception. Teachers can give students experiments, practices, and context on how the concepts work in daily life. The fourth is for other researchers. This research can be a reference for other researchers' future works. Improvements can also be done such as adding more questions to make the instruments more equally distributed.