CHAPTER V
CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

5.1 Conclusions

This study indicated that the four-tier test instrument was helpful in providing detailed information about the levels of students' conceptions, on the concepts of cells. Educators can better assess how students comprehend the material and spot any misconceptions by using a four-tier test. In this manner, learning improvement initiatives can be more targeted and concentrated. According to data from a sample of students in this study, more than a third demonstrated (35.38%) indicating they have a good understanding of the subject matter. Nearly a quarter (24.57%) of students fall into the "lack of knowledge" category, indicating that they have a lack of basic knowledge. Just over (15.32%) of the student responses indicated misconceptions, while the remaining responses were either false positive (18.27%) or false negative (6.47%). These findings show that students who suffer from more misconceptions and a lack of knowledge should receive extra attention.

Even though the percentage is low, it is crucial to overcome misconceptions in order to deepen students' understanding. The results show that students tended to have misconceptions about the "cells and microscopes". These misconceptions may have an impact on students' overall comprehension, even though the percentage is relatively low. The findings of student interviews also offer crucial insights into the causes of misconceptions, such as flawed intuitions, insufficient or inaccurate reasoning, and inappropriate teaching strategies.

5.2 Implications

There are a number of implications for biology learning and teaching methods. Teachers can create more successful lesson plans and curricula by having a better understanding of the misconceptions students have about cell topics. The following are the study's implications:

a. Curriculum Development: By identifying common misconceptions regarding cell topics, educators and curriculum developers can create focused interventions. Teachers can provide educational resources and

activities that specifically target the areas in which students frequently struggle by addressing particular misconceptions.

b. Formative Assessment: Teachers can benefit from using the four-tier diagnostic exam employed in this study as a formative assessment tool. Teachers can modify their teaching methods and give prompt feedback to encourage conceptual change by regularly assessing their students to identify their misconceptions.

c. Misconception Awareness: It is beneficial for junior high school teachers to be aware of the typical misunderstandings that students have about cell topics. Teachers may be able to anticipate and correct these errors in their lessons thanks to this insight, which could result in more effective instruction.

In conclusion, the research's consequences can help other researchers who want to investigate students' misconceptions about various biology issues. Junior high school teachers can also use the results and suggestions to improve their methods and help their students gain a deeper comprehension of cell topics. Also, the research's implications help educators investigate and enhance the teaching and learning process in line with learning goals. By accomplishing this aim, students would be able to possess the necessary scientific knowledge, particularly with regard to the cells. Aside from that, with the results of the four-level diagnostic, teachers are more aware of students' abilities, understand obstacles and how to solve the problems.

5.3 Recommendations

The research recommends a number of crucial areas for improving students' understanding of the concept of cell topics. In order to get a more thorough grasp of students' misconceptions regarding cell topics, the four-tier test instrument can be used more widely and more extensively to assess students from different educational levels. More participants will result in more representative research findings and more robust generalizations. The quantity of questions on each subtopic should be adjusted to ensure that they are equal and do not skew the findings. In order to dispel students' misunderstandings, more effective teaching techniques must be created to improve student comprehension.

It would be more effective if the Four-Tier Diagnostic Test is used directly after the topic is learnt in class so that the research will get better results, because when taking the test, students still remember what they learnt from the topic. In addition, it is also important to introduce the use of the four-tier diagnostic test instrument gradually. However, the instrument used in this study is appropriate as a misconception diagnosis tool.

In addition, a suggestion is that teachers assess students' conceptual level using the four-tier exam instrument. In order to provide a more thorough knowledge of students' misconceptions regarding the concepts of cell, the four-tier test instrument should be used to prevent misconceptions and improve students' comprehension. The teacher needs to be aware of misconceptions, the cognitive development stage of the students, other factors that lead to misconceptions, and research on the topics that need to be taught.

Finally, it is suggested that additional studies on how students understand the concepts of cell, comparing different curricula and learning strategies to dispel misconceptions and variables influencing students' confidence be undertaken.