

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Understanding students' conceptions is a significant move towards improving the quality of science education. In biology, particularly in abstract topics like the classification of living things, students are prone to developing misconceptions due to conceptual difficulty, prior knowledge, and pedagogical limitations. These misconceptions, if not accurately diagnosed, may get entrenched and disrupt future learning. Therefore, in this study, a four-tier diagnostic test was utilized to assess students' comprehension and identify specific misconceptions among junior high school students in the East Bandung Region.

Based on the analysis of 557 eighth-grade students' responses, five categories of student understanding were identified. The most outstanding percentage was "lack of knowledge" with 33.46%, which indicated that many students were unsure of the material or lacked confidence in their justification. The next was misconceptions with 23.58%, where the students were wrong confidently, and scientific knowledge with 21.71%, representing correct and confident knowledge. False negatives were also at 11.18% and false positives at 10.09%, representing uncertainty or inconsistency in the reasoning of the students.

In sub-topic analysis, misconceptions were most prevalent in the topic of "Living Things are Diverse," particularly in questioning regarding taxonomic order and the use of dichotomous or determination keys. For example, in Question 11, 58.17% of the students had misconceptions in constructing a dichotomous key. Similarly, in Question 9, 49.91% of the students had misconceptions on the sequence of classification levels, such as kingdom to species. These findings show that students struggle with hierarchical relationships and abstract classification processes in biology.

In conclusion, the four-tier diagnostic test was successful in revealing students' conceptual understanding, confidence, and reasoning in a detailed manner. The findings point to the imperative need for instructional intervention using inquiry-based learning, contextual examples, and interactive methods to remedy conceptual misconceptions. The research provides valuable data to teachers, curriculum developers, and researchers to design targeted interventions and develop more effective diagnostic tools to improve students' conceptual understanding, especially in concepts of biology that are prone to misconception.

5.2 Recommendation

This study has several limitations that need to be considered. One limitation is that the timing of the diagnostic test, which is not always close to the time of learning the material, may also affect the accuracy of students' responses, as there is a possibility of decreased recall or interference from other learning. Another limitation is that students' understanding of the four-level test format is not optimal, especially if they are not familiar with the structure of complex questions like this, which may affect the validity of their answers.

However, despite these limitations, this study makes a very meaningful contribution, especially in the context of developing assessment instruments that are able to explore students' conceptual understanding more deeply. The four-level diagnostic test proved to be an appropriate and reliable tool for identifying misconceptions, so it can be used as a basis for teachers to develop more effective and targeted learning strategies. In addition, this research also provides a clear direction for improving classroom learning, emphasizing the importance of interactive methods, continuous assessment, and approaches that consider students' cognitive developmental stages. If utilized consistently and supported by adequate teacher training, the findings and approaches from this study have great potential to improve the quality of science learning, especially in terms of science literacy and understanding of biological concepts at the junior high school level.