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Analysis of Students' Misconception on General Biology Concepts Using Four-Tier Diagnostic Test (FTDT)

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ABSTRACT

This research aims to determine the percentage of students' misconception on general biology concepts using the Four-Tier Diagnostic Test (FTDT). This research method is descriptive research. The research sample was 100 students from IKIP Budi Utomo, Universitas Nusantara PGRI Kediri, and Universitas PGRI Madiun. The research instrument is the FTDT question. The data collection techniques by distributing FTDT questions via Google Form to students using WhatsApp. The data analysis technique was done by quantitative descriptive. The results showed that 25% of students understood the concept, 39% of students had misconception, 23% of students guessed the answer, and 13% of students lack knowledge. The lowest student misconception on the concept of structure and function at all levels of biological organization is 20% and the highest misconception on the concept of the definition of biology is 65%. While the sequence of the third category of students' highest misconception is 65% misconception, 11% false positive, and 12% false negative. The results of this study are important to provide advice to lecturers when teaching general biology to always provide correct information, valid reading sources, valid learning media, and appropriate learning models so that there are no misconceptions among students.

INTRODUCTION

Prospective biology educators or teachers must master general biology concepts well for teaching provision in Junior High School and Senior High School levels as a form of their professional competence. General biology is a basic and prerequisite course that must be mastered by students of the Department of Biology Education (Kurikulum, 2017). General biology includes concepts that will be studied again in-depth in courses in the next semester (Ita, 2020). For example, the theory of the cell is the basic unit for the structure and function of organisms which will be deepened again in the cell biology course. So that students must have the correct general biological concepts as the basis for the scientific footing that they will master. General biology is one of the subjects that has a fairly high level of difficulty for students in mastering the concept (Çimer, 2012; Etobro & Fabinu, 2017; Fauzi & Fariantika, 2018).

The success rate of students in mastering general biology concepts is still in the poor category in Higher Education. The difficulties experienced by students can be caused by several factors including the learning strategies brought by the teacher, student habits in learning, low learning intensity, students' fear of certain topics, and the lack of learning resources (Muspikawijay et al., 2017; Etobro & Fabinu, 2017; Ichsan & Mulyani, 2018). Students who have difficulty understanding and interpreting concepts will interpret the concepts they are learning on their own, causing misconceptions in themselves (Savira et al., 2019; Kamilah & Suwarna, 2019). Misconceptions can occur because of the acceptance of wrong information, integration errors, and perceptions that are not the same as scientific principles (Kumandaş et al., 2018; Duda et al., 2020;

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