

ABSTRACT

Mindo Laura Victoria Tampubolon, IDN 4193141004 (2024). Development of PjBL -Based Modules and Its Effect on Learning Outcomes, Critical Thinking and Problem-Solving Skills on The Topic of Determination, Differentiation, and Organogenesis.

This study aimed to develop a Project-Based Module on the topic of determination, differentiation, and organogenesis that is feasible and effective in improving students' cognitive learning outcomes, critical thinking, and problem-solving skills. The module using 4Ds model consisting define, design, development, and disseminating, which then underwent validation and student response for its feasibility in terms of material adequacy, learning process, and layout design. The module was also tested for its effectiveness in improving cognitive learning outcomes, critical thinking, and problem-solving skills. The validation results showed that the modules are categorized as "very worthy" in material adequacy (86.5%), learning process (95.8%), and layout design (86.5%). The student responses to the module are also categorized as "very worthy" in small-group trials (87.12%) and limited-group trials (88.43%). After implementing the module, the independent t-test results show a significant difference in cognitive learning outcomes ($P = 0.00$), critical thinking ($P = 0.00$), and problem-solving skills ($P = 0.00$) between the control and experimental posttest results. Thus, the project-based module improves student's cognitive learning outcomes, critical thinking, and problem-solving skills in the animal development course.

Keywords: Critical thinking; learning outcome; problem-solving skill; project-based module