

ABSTRAK

KENARI BR SINURAYA. Pengembangan Buku Induksi Akar Anggrek *Cattleya* sp. Secara *In Vitro*. Tesis. Medan: Program Studi Magister Pendidikan Biologi, Program Pascasarjana Universitas Negeri Medan, Juli 2023

Penelitian ini bertujuan menghasilkan buku induksi akar anggrek *Cattleya* sp. berbasis riset sebagai bahan ajar pendukung perkuliahan kultur jaringan, mengetahui kelayakan buku sebagai bahan ajar menurut validator ahli, respon dosen pengampu mata kuliah kultur jaringan dan respon mahasiswa, serta efektivitasnya dalam meningkatkan kemampuan kognitif mahasiswa. Metode yang digunakan yakni penelitian dan pengembangan dengan model 4D (*Define, Design, Develop* dan *Disseminate*) Thiagarajan. Validasi produk dilakukan oleh 4 validator ahli yaitu validator isi materi, desain pembelajaran, desain *layout* dan dosen pengampu mata kuliah kultur jaringan. Penelitian berlangsung di Jurusan Biologi UNIMED dan penelitian riset induksi akar anggrek dilaksanakan di laboratorium Kultur Jaringan YAHDI di Jln. Lambung No. 18 Tanah 600 Medan Marelan, Kode pos 20254. Pengumpulan data dilakukan melalui observasi, angket dan tes. Instrumen validasi yang digunakan dalam bentuk kuesioner (skala likert). Berdasarkan hasil validasi yang telah dilakukan, buku Induksi Akar Anggrek *Cattleya* sp. sangat layak digunakan sebagai bahan ajar pendukung dengan skor penilaian hasil validasi ahli materi sebesar 93,3% (sangat baik), validasi ahli desain pembelajaran sebesar 97% (sangat baik), validasi ahli desain *layout* sebesar 97,3% (sangat baik), validasi dosen pengampu mata kuliah kultur jaringan sebesar 94,4% (sangat baik). Sementara berdasarkan hasil tes efektivitas, diketahui bahwa penggunaan buku Induksi Akar Anggrek *Cattleya* sp. efektif meningkatkan kemampuan kognitif mahasiswa diketahui dari nilai rata-rata N-Gain untuk kelas eksperimen yaitu sebesar 0.74 ($0,74 > 0,70$) atau 73.53% dengan kategori tinggi dan cukup efektif. Hasil uji *independent sample t-test* dalam analisis perbedaan rata-rata, ditemukan bahwa nilai t hitung $>$ dari t tabel ($4,859 < 2,018$) dan nilai probabilitas *2-tailed* lebih kecil dari 0.05 ($0.000 > 0.05$) dengan demikian buku yang dikembangkan berhasil memunculkan perbedaan peningkatan hasil *post test* secara signifikan pada kelas eksperimen dan kelas kontrol.

Kata kunci: Induksi, Cattleya sp., in vitro, Efektivitas, Pengembangan

ABSTRACT

KENARI BR SINURAYA. The Development of Book About *Cattleya* sp. Orchid Root Induction By In Vitro Method. Thesis. Medan: Master of Biology Education Study Program, Postgraduate Program, Medan State University, July 2023

This study aims to produce a book of *Cattleya* sp. root induction based on research by in vitro method as a supplementary book on the subject matter of Tissue Culture, to determine the appropriateness of the book as learning materials according to expert validators, lecturer's respond, and colleger's responses, and its effectiveness in improving colleger's cognitive ability. The method used is research and development with a 4D (*Define, Design, Develop* and *Disseminate*) Thiagarajan model. Product validation is done by 4 validators, material content validators, learning design validators, layout design validators and the lecturer's validators. The research was realized at Biology class of Medan State University and the research of *Cattleya* sp. root induction was realized at YAHDI's Tissue Culture Laboratory at Lambung street number 18 Tanah 600 Medan Marelan 20254. The data were collected by using observation, questionnaires, and tests. The instrument used in the questionnaire is a likert scale. Based on the results of content validators are 93.3% with a decent category, learning design validators are 97% with a decent category, layout design validators are 97.3% with a decent category, and lecturer's assessment is 94.4 % with a decent category. While based on the results of the effectiveness test, it is known that the use of a book of *Cattleya* sp. root induction is effective in improving students' cognitive abilities known from the average N-Gain value for the experimental class, namely 0.74 ($0.74 > 0.70$) or 73.53% in the high and quite effective category. Test results independent sample t-test in the analysis of the average difference, it was found that the t count $>$ from t table ($4.859 < 2.018$) and the probability value 2-tailed smaller than 0.05 ($0.000 > 0.05$) thus the book developed succeeded in bringing out the difference in increasing yield post test significantly in the experimental class and control class.

Keywords: Induction, Cattleya sp., in vitro, Effectiveness, The Development