PRAKTIKUM BIOKIMIA ISOLASI DNA JERUK LOKAL BENGKULU UNTUK MENINGKATKAN KETERAMPILAN BERPIKIR SISTEM MAHASISWA

DISERTASI

Diajukan untuk Memenuhi Sebagian dari Syarat untuk Memperoleh Gelar Doktor
Pendidikan Ilmu Pengetahuan Alam

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2025

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Penulis

PRAKTIKUM BIOKIMIA ISOLASI DNA JERUK LOKAL BENGKULU UNTUK MENINGKATKAN KETERAMPILAN BERPIKIR SISTEM MAHASISWA

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ABSTRAK

Penelitian ini bertujuan untuk menghasilkan program praktikum biokimia isolasi DNA jeruk lokal Bengkulu untuk meningkatkan keterampilan berpikir sistem mahasiswa. Penelitian menggunakan metode *mixed-methods research* dengan desain *exploratory sequential design* (*QUAN emphasized)*, melibatkan 72 mahasiswa program studi kimia yang sedang mengikuti praktikum bioikimia. Instrumen yang digunakan meliputi tes tertulis, lembar kerja mahasiswa (LKM), dan kuesioner respon mahasiswa. Teknik analisis data melalui *gain*, uji beda, dan *N-gain*. Hasil penelitian menunjukkan bahwa; 1) Program praktikum yang dikembangkan memiliki karakteristik; kontekstual, menggunakan alat laboratorium modern, serta keterampilan berpikir sistem, 2) Program ini meningkatkan penguasaan konsep, yaitu penguasaan tertinggi pada konsep tujuan isolasi DNA dan terendah pada konsep elektroforesis 3) Keterampilan berpikir sistem mahasiswa meningkat, dengan kategori tinggi pada level kognitif mengevaluasi (C5) untuk indikator mengenali interkoneksi, mengidentifikasi umpan balik, dan membuat model simulasi, serta pada level menganalisis (C4) untuk indikator memahami perilaku dinamis dan menggunakan model konseptual, 4) Program ini memiliki keunggulan dalam meningkatkan keterlibatan mahasiswa secara langsung dan pengembangan keterampilan berpikir sistem. Terdapat keterbatasan seperti keterbatasan daya dukung instrumen laboratorium, variasi sampel yang terbatas, serta prosedur praktikum yang cukup panjang. Peneliti selanjutnya dapat mengembangkan praktikum biokimia dengan meningkatkan keterampilan berpikir sistem.

Kata kunci: praktikum biokimia, isolasi DNA, jeruk lokal Bengkulu, keterampilan berpikir sistem, penguasaan konsep

BIOCHEMISTRY PRACTICUM ON DNA ISOLATION OF BENGKULU LOCAL CITRUS TO ENHANCE STUDENTS' SYSTEMS THINKING SKILLS

ABSTRACT

This study aims to develop a biochemistry practicum program for the DNA isolation of Bengkulu local citrus to enhance students' systems thinking skills. The research employed a mixed-methods research with an exploratory sequential design (QUAN emphasized), involving 72 chemistry students enrolled in a biochemistry practicum course. The instruments used included written tests, student worksheets, and student response questionnaires. Data were analyzed using gain, t-test, and N-gain. The results showed that: (1) the developed practicum program was characterized by contextual, the use of modern laboratory equipment, and incorporates systems thinking skills; (2) the program proved effective in enhancing students' conceptual mastery, with the highest improvement observed in the concept of the purpose of DNA isolation and the lowest in the concept of electrophoresis; (3) The biochemistry practicum on DNA isolation enhances students' systems thinking skills, with high-level improvements at the evaluating level (C5) for the indicators of recognizing interconnections, identifying feedback, and constructing simulation models, as well as at the analyzing level (C4) for the indicators of understanding dynamic behavior and using conceptual models; (4) the program offered benefits in enhancing direct student engagement and the development of systems thinking skills, although some limitations remained, including limited laboratory equipment capacity, narrow sample variation, and relatively lengthy practicum procedures. Future researchers can develop biochemistry practicum programs by enhancing systems thinking skills.

Keywords: biochemistry practicum, DNA isolation, Bengkulu local citrus, systems thinking skills, conceptual mastery

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