

ABSTRAK

Silaen, Melita Ratna Sari. 2021. *Pengembangan Laboratorium Virtual Analisis DNA Berbasis Android untuk Kelas XII SMA*, Skripsi. Tanjungpinang: Program Studi Pendidikan Biologi, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Maritim Raja Ali Haji. Pembimbing I: Azza Nuzullah Putri S.Pd., M.Pd. Pembimbing II: Bony Irawan S.Pd., M.Pd.

Kata Kunci : Laboratorium Virtual, Analisis DNA, Praktikum.

Penelitian ini bertujuan untuk mengembangkan media pembelajaran berupa Laboratorium Virtual Analisis DNA berbasis *Android* dalam pembelajaran biologi kelas XII SMA dengan memperhatikan tingkat keefektifan, kevalidan, serta kepraktisan dalam penerapannya serta menambah pengalaman siswa dalam belajar. Penelitian ini merupakan penelitian pengembangan (*Research and Development*) dengan menggunakan model penelitian pengembangan jenis ADDIE yang diantaranya mengandung kegiatan analisis (kebutuhan, kurikulum, karakteristik peserta didik, materi), desain/perancangan, *development* (pengembangan), implementasi serta evaluasi. Media ini dilengkapi fitur menu dimana pengguna dapat menjelajahi aplikasi sehingga tidak monoton/terfokus pada kegiatan praktikum saja. Pemilihan desain dan warna pada media yang dikembangkan yaitu dengan memperhatikan masalah emosional yang menciptakan keaktifan, kedinamisan dan mendekatkan media dengan penggunaannya. Instrumen yang digunakan dalam penelitian ini berupa angket validitas, praktikalitas serta soal test (*pre test* dan *post test*) yang diperoleh dari ahli media dan materi dan juga siswa. Subjek penelitian pada pengembangan media laboratorium *virtual* analisis DNA yaitu siswa kelas XII IPA sebanyak 30 siswa yang diambil dari 2 kelas. Berdasarkan hasil penelitian yang telah dilakukan, media pembelajaran laboratorium *virtual* yang dikembangkan memenuhi aspek valid, praktis serta efektif. Persentase pemerolehan rata-rata tingkat validitas materi dari ahli materi sebesar 95%, pada ahli media diperoleh sebesar 86%. Tingkat praktikalitas berdasarkan penilaian guru dan siswa sebesar 86% dan tingkat keefektifan (hasil belajar kognitif) penggunaan media pembelajaran laboratorium *virtual* yaitu sebesar 86%). Dengan hasil yang didapatkan dari penelitian tersebut, maka media laboratorium *virtual* analisis DNA berbasis *Android* yang dikembangkan dinyatakan valid, praktis dan efektif digunakan dalam pembelajaran biologi SMA.

ABSTRACT

Silaen , Melita Ratna Sari. 2021. *The Development of Virtual Laboratory on Analysis of DNA For Students in Grade XII Senior High School*, Thesis. Tanjungpinang. Biology Education Study Program, Faculty of Teacher Training And Education ,University of Maritim Raja Ali Haji . Advisor: Azza Nuzullah Putri, S.Pd., M.Pd. Co-Advisor: Bony Irawan S.Pd., M.Pd.

Keywords: Virtual Laboratory, Analysis of DNA, Practicum.

This study was aimed to develop learning media in the form of a Virtual Laboratory for DNA Analysis based on Android in biology learning for class XII SMA by paying attention to the level of effectiveness, validity, and practicality in its application and increasing student experience in learning. This research was a development research (Research and Development) using the ADDIE type of development research model which includes analysis activities (needs, curriculum, student characteristics, materials), design, development, implementation and evaluation. This media was equipped with a menu feature where users can explore the application so it is not monotonous/focused on practical activities only. The choice of design and color in the developed media is by paying attention to emotional problems that create liveliness, dynamism and bring the media closer to its users. The instruments used in this study were questionnaires of validity, practicality and test questions (pre test and post test) which were obtained from media and material experts as well as students. The research subjects on the development of DNA analysis virtual laboratory media were 30 students of class XII IPA as many as 30 students drawn from 2 classes. Based on the results of the research that has been done, the virtual laboratory learning media developed fulfills the valid, practical and effective aspects. The percentage of obtaining the average level of material validity from material experts was 95%, for media experts it was 86%. The level of practicality based on teacher and student assessments was 86% and the level of effectiveness (cognitive learning outcomes) using virtual laboratory learning media was 86%). With the results obtained from the research, the Android-based DNA analysis virtual laboratory media that was developed was declared valid, practical and effective for use in high school biology learning.