

**PENGEMBANGAN MULTIMEDIA INTERAKTIF LABORATORIUM
VIRTUAL PRAKTIKUM SIMULASI UJI DNA PADA KELAS XI DI SMA
NEGERI 1 BANJAR**

Oleh

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ABSTRAK

Materi genetika, khususnya pada praktikum simulasi uji DNA, merupakan salah satu materi biologi yang bersifat abstrak dan membutuhkan pengalaman belajar berbasis praktikum. Namun, kondisi di lapangan menunjukkan bahwa pelaksanaan praktikum uji DNA di sekolah sering mengalami kendala, seperti keterbatasan alat dan bahan di laboratorium fisik, sehingga proses pembelajaran belum dapat berlangsung secara optimal. Penelitian ini bertujuan untuk menghasilkan multimedia interaktif laboratorium virtual praktikum simulasi uji DNA pada kelas XI di SMA Negeri 1 Banjar serta mengetahui respon peserta didik terhadap media yang dikembangkan. Pada penelitian ini menggunakan metode Research and Development (R&D) dengan model pengembangan 4-D (Define, Design, Development, Disseminate). Multimedia interaktif laboratorium virtual dikembangkan menggunakan perangkat lunak Adobe Animate dengan dukungan Adobe Illustrator dan Figma, serta dirancang berbasis web agar mudah diakses oleh peserta didik. Hasil penelitian menunjukkan bahwa multimedia interaktif laboratorium virtual yang dikembangkan dinyatakan sangat valid dengan rata-rata koefisien validasi ahli isi dan ahli media sebesar 1,00. Uji respon siswa menunjukkan respon “Sangat Baik”. Dengan demikian, multimedia interaktif laboratorium virtual ini dinilai layak dan dapat membantu meningkatkan pemahaman serta motivasi belajar siswa dalam mempelajari materi genetika.

Kata Kunci: Genetika, Multimedia Interaktif, Laboratorium Virtual, Biologi, 4-D, Simulasi Uji DNA.

***DEVELOPMENT OF INTERACTIVE MULTIMEDIA VIRTUAL
LABORATORY DNA TESTING SIMULATION PRACTICUM IN GRADE XI
AT STATE SENIOR HIGH SCHOOL 1 BANJAR***

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ABSTRACT

Genetics, particularly DNA testing simulation practicums, is a biological subject that is abstract and requires hands-on learning experiences. However, field conditions indicate that DNA testing practicums in schools often encounter obstacles, such as limited equipment and materials in the physical laboratory, preventing optimal learning. This study aims to create an interactive multimedia virtual laboratory for DNA testing simulation practicums for eleventh-grade students at SMA Negeri 1 Banjar and to assess student responses to the developed media. This study employed the Research and Development (R&D) method with a 4-D development model (Define, Design, Develop, Disseminate). The interactive multimedia virtual laboratory was developed using Adobe Animate software with Adobe Illustrator and Figma support, and was designed as a web-based platform for easy student access. The results showed that the developed interactive multimedia virtual laboratory was highly valid, with an average validation coefficient of 1.00 from content experts and media experts. Student response testing showed a "Very Good" response. Therefore, this interactive multimedia virtual laboratory is deemed feasible and can help improve student understanding and motivation in studying genetics.

Keywords: Genetics, Interactive Multimedia, Virtual Laboratory, Biology, 4-D, DNA Test Simulation.