PENGEMBANGAN APLIKASI *AUGMENTED REALITY* UNTUK PEMBELAJARAN SISTEM PERNAPASAN MANUSIA DENGAN ALGORITMA *LCM* DAN *FISHER YATES*

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ABSTRAK

Pembelajaran sistem pernapasan di sekolah dasar sering dianggap membosankan dan kurang interaktif, sehingga menurunkan minat belajar siswa. Untuk mengatasi hal tersebut, penelitian ini bertujuan mengembangkan aplikasi edukasi berbasis *Augmented Reality* (AR) *marker-based* yang dirancang untuk siswa kelas 5–6. Aplikasi ini menyajikan visualisasi 3D organ pernapasan melalui kamera perangkat, serta kuis interaktif dengan algoritma *Linear Congruent Method* (LCM) untuk mengacak soal dan *Fisher-Yates Shuffle* (FYS) untuk mengacak jawaban. Metode riset yang digunakan adalah *Research and Development* (R&D) dengan model pengembangan perangkat lunak *Multimedia Development Life Cycle* (MDLC). Pengumpulan data dilakukan melalui observasi, wawancara, dan dokumentasi di lingkungan sekolah. Pengujian fungsional menggunakan metode *black box* testing menunjukkan bahwa seluruh fitur berjalan sesuai harapan, dengan tingkat keberhasilan 100%. Hasil ini menunjukkan bahwa aplikasi telah memenuhi persyaratan fungsionalitas dan dapat menjadi media pembelajaran yang interaktif.

Kata kunci: Android, *Augmented Reality*, *Fisher-Yates Shuffle* (FYS), *Linear Congruent Method* (LCM), Sistem Pernapasan

DEVELOPMENT OF AN AUGMENTED REALITY APPLICATION FOR HUMAN RESPIRATORY SYSTEM LEARNING USING LCM AND FISHER-YATES ALGORITHMS

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ABSTRACT

Learning about the respiratory system in elementary school is often considered boring and less interactive, which can decrease students' interest in learning. To address this, this research aims to develop a marker-based Augmented Reality (AR) educational application designed for 5th and 6th-grade students. The application presents 3D visualizations of respiratory organs through a device's camera, along with interactive quizzes utilizing the Linear Congruent Method (LCM) algorithm to randomize questions and the Fisher-Yates Shuffle (FYS) to randomize answers. The research method used is Research and Development (R&D) with the Multimedia Development Life Cycle (MDLC) software development model. Data collection was conducted through observation, interviews, and documentation within the school environment. Functional testing using the black box method showed that all features operated as expected, achieving a 100% success rate. These results indicate that the application has met its functional requirements and can serve as an interactive learning medium.

Keywords: Android, Augmented Reality, Fisher-Yates Shuffle (FYS), Linear Congruent Method (LCM), Respiratory System