

PENGEMBANGAN SIMULASI BERBASIS AUGMENTED REALITY PENYAMBUNGAN KABEL FIBER DAN JARINGAN FTTH

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ABSTRAK

Penelitian ini berfokus pada pengembangan media pembelajaran berbasis *Augmented Reality* (AR) untuk materi kabel fiber optik dan jaringan FTTH. Metode yang digunakan adalah *Research and Development* (R&D) dengan model pengembangan 4D yang mencakup empat tahapan (*Define, Design, Develop, dan Disseminate*). Produk diuji melalui uji *blackbox*, *whitebox* perorangan, uji kelompok kecil, uji lapangan, pretest, posttest, serta uji respon peserta didik dan guru. Hasil pengujian *blackbox* dan *whitebox* menunjukkan bahwa aplikasi berjalan sesuai fungsinya. Uji kelompok kecil 91,5%, uji lapangan 91,47%, dan masing-masing masuk dalam kategori sangat layak. Efektivitas media juga diperkuat dengan hasil perhitungan *N-Gain* sebesar 0,82 dengan kategori “Tinggi”. Tanggapan peserta didik terhadap media menunjukkan skor rata-rata 68,6% dan dikategorikan “Sangat Positif”, sedangkan tanggapan guru memperoleh 44 dari total 50 yang berada pada kategori “Sangat Positif”. Berdasarkan keseluruhan hasil analisis kuantitatif, pengembangan simulasi berbasis *Augmented Reality* penyambungan kabel fiber dan jaringan FTTH dinyatakan valid, efektif, dan praktis untuk digunakan dalam pembelajaran FTTx khususnya materi fiber optik dan jaringan FTTH.

Kata Kunci : *Augmented Reality*(AR) , Media Pembelajaran, Fiber Optik, FTTH, R&D, 4D

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ABSTRACT

This study focuses on the development of a learning media based on Augmented Reality (AR) for fiber optic cable and FTTH network materials. The research method employed was Research and Development (R&D) using the 4D model (Define, Design, Develop, and Disseminate). The product was tested through blackbox and whitebox testing, individual trials, small group testing, field testing, pretest and posttest, as well as student and teacher response evaluations. The results of blackbox and whitebox testing indicated that the application functioned properly. The small group trial obtained a score of 91.5%, the field test 91.47%, and all categorized as highly feasible. The effectiveness of the media was further supported by an N-Gain score of 0.82 (High category). Student responses showed an average score of 68.6% (Very Positive), while teacher responses scored 44 out of 50 (Very Positive). Based on these findings, the development of the AR-based simulation for fiber optic cable splicing and FTTH networks was declared valid, effective, and practical for use in FTTx learning, particularly in fiber optic and FTTH network materials.

Keyword : Augmented Reality, Learning Media, Fiber Optic, FTTH, R&D, 4D Model