

ABSTRAK

Tio Ainawani: Pengembangan Media Pembelajaran Berbasis *Augmented Reality* pada Mata Pelajaran Dasar-Dasar Teknik Jaringan Komputer dan Telekomunikasi di SMK Negeri 1 Beringin. Fakultas Teknik Universitas Negeri Medan. 2026.

Pembelajaran pada Elemen 5 Mata Pelajaran Dasar-Dasar Teknik Jaringan Komputer dan Telekomunikasi (TJKT) menuntut peserta didik memiliki pemahaman mengenai penggunaan dan karakteristik perangkat jaringan komputer sebagai dasar sebelum mempelajari konfigurasi jaringan. Hasil analisis kebutuhan dan wawancara dengan guru menunjukkan bahwa peserta didik masih mengalami kesulitan memahami bentuk, fungsi, dan karakteristik perangkat jaringan karena media yang digunakan masih berupa gambar dua dimensi sehingga konsep menjadi abstrak. Penelitian ini bertujuan mengembangkan media pembelajaran berbasis *Augmented Reality*, mengetahui tingkat kelayakan media, respon peserta didik, serta efektivitas media dalam meningkatkan pemahaman belajar pada materi perangkat jaringan komputer.

Penelitian ini menggunakan metode *Research and Development (R&D)* dengan model *ADDIE (Analysis, Design, Development, Implementation, dan Evaluation)*. Subjek penelitian terdiri atas 30 peserta didik kelas X TJKT 1 SMK Negeri 1 Beringin. Data dikumpulkan melalui wawancara, dokumentasi, angket validasi ahli materi dan ahli media, angket respon peserta didik, serta tes *pretest* dan *posttest*. Analisis data menggunakan analisis deskriptif persentase dan uji *Normalized Gain (N-Gain)*. Media *Augmented Reality* digunakan untuk menampilkan objek tiga dimensi perangkat jaringan komputer sehingga peserta didik dapat mengamati bentuk, fungsi, dan karakteristik perangkat secara lebih konkret.

Hasil penelitian menunjukkan bahwa media memperoleh persentase validasi ahli materi sebesar 87% dan ahli media sebesar 82,60% dengan kategori sangat layak. Respon peserta didik memperoleh persentase sebesar 93,52% dengan kategori sangat positif. Efektivitas media ditunjukkan oleh peningkatan nilai rata-rata *pretest* dari 12,07 (60,33%) menjadi 18,27 (91,33%) pada *posttest* dengan nilai *N-Gain* sebesar 0,78 berkategori tinggi. Dengan demikian, media pembelajaran berbasis *Augmented Reality* dinyatakan sangat layak, memperoleh respon sangat positif, dan efektif meningkatkan pemahaman belajar peserta didik.

Kata kunci: *Augmented Reality*, media pembelajaran, Dasar-Dasar Teknik Jaringan Komputer dan Telekomunikasi (TJKT), perangkat jaringan komputer, pemahaman belajar.

ABSTRACT

Tio Ainawani: Development of Augmented Reality-Based Learning Media for the "Fundamentals of Computer Network and Telecommunication Engineering" Subject at SMK Negeri 1 Beringin. Faculty of Engineering, State University of Medan. 2026.

Instruction regarding Element 5 of the "Fundamentals of Computer Network and Telecommunication Engineering" (TJKT) subject requires students to understand the usage and characteristics of computer network devices as a foundation before learning about network configuration. Needs analysis and teacher interviews revealed that students still struggle to grasp the form, function, and characteristics of network devices because the media used—two-dimensional images—render the concepts abstract. This study aims to develop Augmented Reality-based learning media and to determine the media's feasibility, student response, and effectiveness in enhancing learning comprehension regarding computer network devices.

This study employs the Research and Development (R&D) method using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The research subjects consisted of 30 students from class X TJKT 1 at SMK Negeri 1 Beringin. Data were collected through interviews, documentation, validation questionnaires (from subject matter and media experts), student response questionnaires, and pre-tests and post-tests. Data analysis utilized descriptive percentage analysis and the Normalized Gain (N-Gain) test. The Augmented Reality media was used to display three-dimensional objects of computer network devices, allowing students to observe the devices' form, function, and characteristics in a more concrete manner.

The results indicate that the media achieved a validation score of 87% from subject matter experts and 82.60% from media experts, placing it in the "highly feasible" category. Student responses yielded a score of 93.52%, falling into the "highly positive" category. The media's effectiveness was demonstrated by an increase in the average score from 12.07 (60.33%) in the pre-test to 18.27 (91.33%) in the post-test, with an N-Gain score of 0.78, indicating a high level of effectiveness. Thus, the Augmented Reality-based learning media is deemed highly feasible, elicited a highly positive response, and effectively improved students' learning comprehension.

Keywords: Augmented Reality, learning media, Fundamentals of Computer Network and Telecommunication Engineering (TJKT), computer network devices, learning comprehension.