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Pengembangan E-Modul Praktikum Sistem Mikroprosesor Berbasis *Project Based Learning* Pada Materi Antarmuka Analog Input

Article Info

Article Information

Received : 22-06-2026

Revised : 27-06-2026

Accepted : 07-07-2026

Kata Kunci: E-modul Praktikum, *Project Based Learning* (PjBL), Antarmuka Analog Input

Abstrak :

Penelitian ini bertujuan mengembangkan e-modul praktikum Sistem Mikroprosesor berbasis *Project Based Learning* (PjBL) pada materi Antarmuka Analog Input yang sesuai dengan Rencana Pembelajaran Semester (RPS) berbasis *Outcome-Based Education* (OBE). Pengembangan dilakukan sebagai solusi terhadap keterbatasan modul praktikum yang masih berbentuk cetak, belum memanfaatkan media pembelajaran interaktif, serta belum mengikuti pembaruan kurikulum. Penelitian menggunakan metode *Research and Development* (R&D) dengan model ADDIE yang dibatasi hingga tahap *Development*, meliputi analisis kebutuhan, perancangan, dan pengembangan produk. E-modul dikembangkan dengan mengintegrasikan sintaks PjBL serta berbagai media interaktif, seperti video pembelajaran, simulasi Tinkercad, GIF, QR Code, dan program Arduino. Kelayakan produk dievaluasi oleh dua ahli materi dan dua ahli media, sedangkan kepraktisan dinilai melalui angket respon dari 20 mahasiswa. Hasil penelitian menunjukkan bahwa e-modul memperoleh persentase kelayakan sebesar 94% dari ahli materi dan 93% dari ahli media dengan kategori (Sangat Layak), sedangkan hasil respon mahasiswa mencapai 92% dengan kategori (Sangat Layak). Dengan demikian, e-modul yang dikembangkan dinyatakan layak dan praktis sebagai bahan ajar pendukung praktikum Sistem Mikroprosesor serta berpotensi meningkatkan kualitas pembelajaran yang lebih interaktif, mandiri, dan berpusat pada mahasiswa

Abstract :

This study aimed to develop a *Project Based Learning* (PjBL) practicum e-module for the Analog Input



Interface topic in the Microprocessor Systems course, aligned with the Outcome Based Education (OBE) Semester Learning Plan (RPS). The development was motivated by the limitations of the existing printed practicum module, which lacked interactive learning media and had not been updated to reflect the latest curriculum. The study employed the Research and Development (R&D) method using the ADDIE model, limited to the Development stage, including needs analysis, design, and product development. The e-module integrates the PjBL syntax with various interactive learning resources, including instructional videos, Tinkercad simulations, GIFs, QR codes, and Arduino programming materials. Product feasibility was evaluated by two subject matter experts and two media experts, while practicality was assessed through questionnaires completed by 20 students. The results showed that the e-module achieved a feasibility score of 94% from subject matter experts and 93% from media experts, both categorized as (Very Feasible). In addition, the student response questionnaire yielded a practicality score of 92%, categorized as (Very Feasible). These findings indicate that the developed e-module is both feasible and practical for supporting Microprocessor Systems practicum activities and has the potential to promote interactive, independent, and student-centered learning
