

ABSTRAK

Leokwando Pasaribu: Pengembangan *Trainer* Motor Listrik Tiga Fasa Untuk Meningkatkan Keterampilan Siswa Kelas XI Jurusan Otomasi Industri di SMKN 13 Medan. Skripsi. Fakultas Teknik Universitas Negeri Medan. 2026

Penelitian ini bertujuan untuk mengembangkan media pembelajaran berupa *trainer* motor listrik tiga fasa berbasis *Programmable Logic Controller* (PLC) guna meningkatkan keterampilan siswa kelas XI Jurusan Otomasi Industri di SMKN 13 Medan. Latar belakang penelitian ini didasarkan pada belum tersedianya media praktik motor listrik tiga fasa yang sesuai dengan kebutuhan pembelajaran di sekolah, sehingga proses pembelajaran praktik sistem kontrol motor listrik belum berjalan secara optimal. Metode penelitian yang digunakan adalah *Research and Development* (R&D) dengan model pengembangan ADDIE yang meliputi tahap *analysis, design, development, implementation, dan evaluation*. Tahap analisis dilakukan melalui observasi dan wawancara dengan guru untuk mengidentifikasi kebutuhan media pembelajaran. Tahap desain meliputi perancangan *trainer* serta penyusunan *jobsheet* sebagai panduan praktik. Pada tahap pengembangan, media yang telah dirancang divalidasi oleh ahli materi dan ahli media. Selanjutnya, tahap implementasi dilakukan melalui uji coba penggunaan media kepada siswa kelas XI Jurusan Otomasi Industri. Tahap evaluasi dilakukan untuk menilai kelayakan media berdasarkan hasil validasi dan respon pengguna. Hasil penelitian menunjukkan bahwa media pembelajaran *trainer* motor listrik tiga fasa berbasis PLC dinilai sangat layak oleh ahli materi dengan persentase sebesar 96,5% dan oleh ahli media dengan persentase sebesar 93%. Selain itu, hasil respon siswa menunjukkan tingkat kelayakan sebesar 93% dengan kategori sangat layak. Berdasarkan hasil tersebut, media pembelajaran ini dinyatakan layak digunakan sebagai sarana pendukung pembelajaran praktik sistem kontrol motor listrik di Sekolah Menengah Kejuruan.

Kata kunci: *Trainer* Motor Listrik Tiga Fasa, PLC, Media Pembelajaran, ADDIE, *Research and Development*, Keterampilan Psikomotorik.

ABSTRACT

Leokwando Pasaribu: Development of a Three-Phase Electric Motor Trainer to Improve the Skills of Grade XI Students in the Industrial Automation Department at SMKN 13 Medan. Faculty of Engineering, State University of Medan. 2026

This study aims to develop a learning medium in the form of a three-phase electric motor trainer based on a Programmable Logic Controller (PLC) to improve the skills of Grade XI students in the Industrial Automation Department at SMKN 13 Medan. The background of this study is the lack of appropriate three-phase electric motor practice media that meets the needs of school-based learning, resulting in suboptimal implementation of practical learning in electric motor control systems. The research method used was Research and Development (R&D) with the ADDIE development model, which consists of the stages of analysis, design, development, implementation, and evaluation. The analysis stage was conducted through observations and interviews with teachers to identify the needs of learning media. The design stage included the design of the trainer and the preparation of job sheets as practical guides. During the development stage, the designed media were validated by material experts and media experts. Furthermore, the implementation stage was carried out through trials of the learning media with Grade XI students of the Industrial Automation Department. The evaluation stage was conducted to assess the feasibility of the media based on validation results and user responses. The results showed that the PLC-based three-phase electric motor trainer learning media was rated very feasible by material experts with a percentage of 96.5% and by media experts with a percentage of 93%. In addition, student responses indicated a feasibility level of 93%, categorized as very feasible. Based on these results, the learning media is declared suitable for use as a supporting tool in practical learning of electric motor control systems at the vocational high school level.

Keywords: Three-Phase Electric Motor Trainer, PLC, Learning Media, ADDIE, Research and Development, Psychomotor Skills.

