

ABSTRAK

Ricky Nelson Tampubolon (5213131005): *Pengembangan Trainer Variable Frequency Drive sebagai Media Pembelajaran Instalasi Motor Listrik di SMKS Sinar Husni 2 TR Labuhan Deli*. Skripsi. Fakultas Teknik Universitas Negeri Medan. 2025

Penelitian ini bertujuan untuk mengembangkan *trainer Variable Frequency Drive* (VFD) sebagai media pembelajaran praktik instalasi motor listrik di SMKS Sinar Husni 2 TR Labuhan Deli. Pengembangan *trainer* dilakukan untuk menjawab kebutuhan akan media praktik yang interaktif, aplikatif, dan sesuai dengan tuntutan dunia industri. Penelitian menggunakan model pengembangan ADDIE yang terdiri dari lima tahapan, yaitu analisis, desain, pengembangan, implementasi, dan evaluasi. Pada tahap analisis, dilakukan observasi, wawancara dengan guru dan lulusan industri, serta telaah kurikulum untuk mengidentifikasi kebutuhan pembelajaran praktik. Tahap desain meliputi perancangan *trainer* VFD yang ergonomis, aman, dan dilengkapi *jobsheet* atau buku kegiatan pembelajaran sebagai panduan praktik siswa. Selanjutnya, produk dikembangkan dan divalidasi oleh ahli materi dan ahli media. Setelah dilakukan revisi berdasarkan masukan para ahli, *trainer* diimplementasikan dalam praktik pembelajaran bersama guru dan siswa kelas XI Teknik Instalasi Tenaga Listrik. Hasil validasi menunjukkan bahwa *trainer* VFD beserta *jobsheet* dinyatakan “Sangat Layak” oleh para ahli dengan rata-rata skor kelayakan di atas 85%. Hasil uji kepraktisan oleh guru dan siswa juga memperoleh kategori “Sangat Praktis”, menandakan bahwa produk mudah digunakan dan efektif mendukung proses pembelajaran praktik instalasi motor listrik. Faktor pendukung utama keberhasilan pengembangan produk ini adalah adanya keterlibatan aktif guru, dukungan sekolah, serta proses revisi berkelanjutan. Adapun kendala yang ditemui meliputi keterbatasan waktu, sumber daya, dan implementasi yang baru dilakukan pada satu sekolah. Dengan demikian, pengembangan *trainer* VFD beserta buku kegiatan pembelajaran ini terbukti dapat menjadi solusi inovatif untuk meningkatkan kualitas pembelajaran praktik di SMK. Produk hasil penelitian ini diharapkan dapat menjadi model pengembangan media praktik yang efektif, relevan, dan adaptif terhadap kebutuhan pendidikan vokasi dan dunia industri.

Kata kunci: *Trainer* VFD, Media Pembelajaran, Instalasi Motor Listrik, ADDIE, SMK.

ABSTRACT

Ricky Nelson Tampubolon (5213131005): Development of a Variable Frequency Drive Trainer as a Learning Medium for Electric Motor Installation at SMKS Sinar Husni 2 TR Labuhan Deli. Essay. Faculty of Engineering, UNIMED. 2025

This research aims to develop a Variable Frequency Drive (VFD) trainer as an instructional medium for practical learning of electric motor installation at SMKS Sinar Husni 2 TR Labuhan Deli. The development of this trainer was motivated by the need for interactive and applicative practical media aligned with current industrial demands. The research utilized the ADDIE development model, consisting of five stages: analysis, design, development, implementation, and evaluation. In the analysis stage, observations, interviews with teachers and graduates working in the industry, and curriculum reviews were conducted to identify the needs of practical learning. The design stage included the ergonomic and safe design of the VFD trainer, supplemented with a jobsheet or learning activity book to guide students' practical activities. The developed product was then validated by subject matter experts and media experts. After revisions based on expert feedback, the trainer was implemented in practical learning activities with teachers and Grade XI students of the Electrical Power Installation program. Validation results indicated that the VFD trainer and jobsheet were categorized as "Highly Feasible" by experts, with an average feasibility score above 85%. The practicality tests conducted by teachers and students also resulted in the "Highly Practical" category, indicating that the product was easy to use and effective in supporting practical electric motor installation learning. Key supporting factors for the successful development of this product included active involvement from teachers, support from the school, and continuous revision throughout the development process. Constraints encountered during the research included limited time, resources, and implementation scope, as the trial was only conducted at one school. In conclusion, the development of the VFD trainer and the learning activity book has proven to be an innovative solution to enhance the quality of practical learning in vocational schools. The product developed in this research is expected to serve as a model for effective, relevant, and adaptive practical instructional media aligned with the needs of vocational education and industry.

Keywords: VFD Trainer, Instructional Media, Electric Motor Installation, ADDIE, Vocational School.