

ABSTRAK

Muhammad Risky Karonia. NIM 2202113001. 2026. Pengembangan Trainer Pengukuran Dasar Listrik *Alternating Current* (AC) dan *Direct Current* (DC) dalam Meningkatkan Pemahaman Konsep Hukum Ohm bagi Siswa Sekolah Menengah Kejuruan (SMK). Skripsi. Program Studi Pendidikan Teknik Elektro, Fakultas Keguruan dan Ilmu Pendidikan, Universitas PGRI Madiun. Pembimbing: (I) Ir. Sulistyaning Kartikawati, M.M., M.Pd., (II) Pramudya Ardi, S.Pd., M.Pd.

Penelitian ini dilatar belakangi oleh rendahnya pemahaman siswa terhadap konsep Hukum Ohm pada mata pelajaran Dasar dan Pengukuran Listrik di SMK PGRI 1 Mejayan akibat pembelajaran yang masih bersifat teoritis, minimnya media pembelajaran interaktif, dan terbatasnya fasilitas praktikum yang representatif. Penelitian ini bertujuan untuk (1) mengembangkan media pembelajaran berupa Trainer Pengukuran Dasar Listrik AC dan DC, (2) mengetahui hasil validasi ahli media, (3) mengetahui respon siswa, dan (4) mengetahui efektivitas trainer dalam meningkatkan pemahaman konsep Hukum Ohm bagi siswa SMK. Penelitian ini menggunakan metode *Research and Development* (R&D) dengan model pengembangan ADDIE (*Analysis, Design, Development, Implementation, Evaluation*). Subjek uji coba penelitian ini adalah 20 siswa kelas X Teknik Ketenagalistrikan SMK PGRI 1 Mejayan. Teknik pengumpulan data dilakukan melalui observasi, wawancara, angket validasi ahli, angket respon siswa, serta soal *pre-test* dan *post-test*. Hasil penelitian menunjukkan bahwa Trainer Pengukuran Dasar Listrik AC dan DC berhasil dikembangkan dengan dilengkapi sumber tegangan AC dan DC, voltmeter dan amperemeter analog serta digital, project board, resistor, lampu sebagai beban, soket banana plug, dan jobsheet praktikum dalam bentuk koper portabel, dengan hasil pengujian kinerja rangkaian menunjukkan nilai error sebesar 0%–0,04%. Hasil validasi ahli media memperoleh persentase sebesar 94% dengan kategori sangat layak, sedangkan respon siswa memperoleh persentase sebesar 85% dengan kategori sangat sesuai. Hasil uji efektivitas menunjukkan peningkatan pemahaman konsep Hukum Ohm, dengan rata-rata skor *pre-test* sebesar 32,25 meningkat menjadi 71 pada *post-test*, serta perolehan nilai N-Gain sebesar 55% dengan kategori cukup efektif. Berdasarkan hasil tersebut, dapat disimpulkan bahwa Trainer Pengukuran Dasar Listrik AC dan DC layak dan efektif digunakan sebagai media pembelajaran praktikum guna meningkatkan pemahaman konsep Hukum Ohm bagi siswa SMK.

Kata Kunci: Trainer pengukuran listrik, *Alternating Current* (AC), *Direct Current* (DC), Hukum Ohm, model ADDIE, media pembelajaran, Sekolah Menengah Kejuruan

Abstract

Muhammad Risky Karonia. Student ID Number 2202113001. 2026. Development of an AC and DC Basic Electrical Measurement Trainer to Improve Students' Understanding of Ohm's Law Concepts in Vocational High Schools (SMK). Undergraduate Thesis. Electrical Engineering Education Study Program, Faculty of Teacher Training and Education, Universitas PGRI Madiun. Advisors: (I) Ir. Sulistyaning Kartikawati, M.M., M.Pd., (II) Pramudya Ardi, S.Pd., M.Pd.

This research was motivated by the low level of students' understanding of Ohm's Law concepts in the Basic Electrical and Measurement subject at SMK PGRI 1 Mejayan. This condition was caused by learning activities that were still predominantly theoretical, the limited availability of interactive learning media, and inadequate representative practical facilities. This study aimed to (1) develop learning media in the form of an AC and DC Basic Electrical Measurement Trainer, (2) determine the results of media expert validation, (3) determine students' responses, and (4) determine the effectiveness of the trainer in improving students' understanding of Ohm's Law concepts in vocational high schools. This research employed the Research and Development (R&D) method using the ADDIE development model, consisting of Analysis, Design, Development, Implementation, and Evaluation. The research subjects were 20 tenth-grade students of the Electrical Engineering Department at SMK PGRI 1 Mejayan. Data were collected through observation, interviews, expert validation questionnaires, student response questionnaires, and pre-test and post-test assessments. The results showed that the AC and DC Basic Electrical Measurement Trainer was successfully developed and equipped with AC and DC voltage sources, analog and digital voltmeters and ammeters, a project board, resistors, lamps as loads, banana plug sockets, and a practical worksheet (jobsheet), all integrated into a portable suitcase. The circuit performance test showed an error rate ranging from 0% to 0.04%. The media expert validation results obtained a percentage of 94%, categorized as **highly feasible**, while the student response results obtained a percentage of 85%, categorized as **highly appropriate**. The effectiveness test indicated an improvement in students' understanding of Ohm's Law concepts, with the average pre-test score increasing from 32.25 to 71 on the post-test, resulting in an N-Gain score of 55%, categorized as **moderately effective**. Based on these results, it can be concluded that the AC and DC Basic Electrical Measurement Trainer is feasible and effective for use as a practical learning medium to improve vocational high school students' understanding of Ohm's Law concepts.

Keywords: Electrical Measurement Trainer, Alternating Current (AC), Direct Current (DC), Ohm's Law, ADDIE Model, Learning Media, Vocational High School