

ABSTRAK

Muhammad Rayyan Ramadhan. 2025. *Pengembangan Modul Pembelajaran Dasar Pemrograman Berbasis Wokwi Simulator di Program Studi Pendidikan Teknik Elektro*. Skripsi. Program Studi Pendidikan Teknik Elektro, FKIP, Universitas PGRI Madiun. Pembimbing (I) Umi Kholifah, M.Pd., (II) Pramudya Ardi, S.Pd., M.Pd.

Kemajuan teknologi informasi dan komunikasi telah mendorong inovasi dalam pendidikan, khususnya dalam pengembangan media pembelajaran berbasis digital. Penelitian ini bertujuan untuk mengembangkan modul pembelajaran dasar pemrograman berbasis Wokwi Simulator pada Program Studi Pendidikan Teknik Elektro Universitas PGRI Madiun, serta mengevaluasi tingkat kelayakan dan respon mahasiswa terhadap modul tersebut. Penelitian menggunakan metode *Research and Development (R&D)* dengan model pengembangan 4D (*Define, Design, Develop, Disseminate*). Pengumpulan data dilakukan melalui angket validasi oleh ahli media, ahli materi, dan angket respon mahasiswa. Hasil validasi ahli media menunjukkan persentase kelayakan sebesar 83%, dan hasil validasi ahli materi sebesar 82%, yang keduanya berada dalam kategori “Sangat Layak”. Uji respon mahasiswa menunjukkan nilai rata-rata sebesar 83% yang juga berada dalam kategori “Sangat Layak”. Hasil tersebut menunjukkan bahwa modul pembelajaran dasar pemrograman berbasis Wokwi Simulator efektif dan sangat layak digunakan sebagai media pembelajaran dan praktikum pada mata kuliah Dasar Pemrograman.

Meskipun demikian, ditemukan bahwa salah satu aspek dalam modul, yaitu fitur tambahan pada Wokwi Simulator, masih kurang dimanfaatkan secara optimal oleh mahasiswa. Beberapa kemungkinan penyebabnya antara lain karena minimnya panduan eksplisit, terbatasnya materi eksploratif dalam modul, serta tampilan antarmuka fitur yang kurang ramah bagi pemula. Kondisi ini menunjukkan adanya ruang perbaikan, terutama dalam pengembangan materi yang lebih mendalam terkait fitur lanjutan seperti simulasi komunikasi serial, penggunaan sensor I2C/SPI, dan visualisasi logika digital. Penambahan petunjuk teknis, video tutorial, serta latihan studi kasus menjadi langkah penting untuk memastikan modul ini dapat digunakan secara lebih maksimal dan mendorong pengembangan kreativitas mahasiswa secara menyeluruh.

Kata Kunci: Wokwi Simulator, Pemrograman Dasar, Modul Pembelajaran, Teknik Elektro

ABSTRACT

Muhammad Rayyan Ramadhan. 2025. *Development of a Basic Programming Learning Module Based on the Wokwi Simulator in the Electrical Engineering Education Program. Thesis. Electrical Engineering Education Program, FKIP, PGRI University of Madiun. Advisors: (I) Umi Kholifah, M.Pd., (II) Pramudya Ardi, S.Pd., M.Pd.*

Advances in information and communication technology have driven innovation in education, particularly in the development of digital-based learning media. This study aims to develop a basic programming learning module based on the Wokwi Simulator for the Electrical Engineering Education Program at PGRI University Madiun, as well as to evaluate the feasibility and student response to the module. The research employs the Research and Development (R&D) method with the 4D development model (Define, Design, Develop, Disseminate). Data collection was conducted through validation questionnaires by media experts, subject matter experts, and student response questionnaires. The results of the media expert validation showed a feasibility percentage of 83%, and the subject matter expert validation results were 82%, both falling into the “Highly Feasible” category. The student response test showed an average score of 83%, which also falls into the “Highly Feasible” category. These results indicate that the Wokwi Simulator-based basic programming learning module is effective and highly feasible for use as a learning and practical tool in the Basic Programming course.

However, it was found that one aspect of the module, namely the additional features in the Wokwi Simulator, was still not being used optimally by students. Some possible causes include a lack of explicit guidance, limited exploratory material in the module, and a feature interface that is not very user-friendly for beginners. This situation indicates room for improvement, particularly in the development of more in-depth materials related to advanced features such as serial communication simulation, the use of I2C/SPI sensors, and digital logic visualization. The addition of technical guidelines, video tutorials, and case study exercises are crucial steps to ensure the module can be utilized to its fullest potential and to foster comprehensive creative development among students.

Keywords: *Wokwi Simulator, Basic Programming, Learning Modules, Electrical Engineering*