



Development of Digital Electronics and Information Literacy Training Kit to Improve the Performance of Students Electrical Engineering Education

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ABSTRACT

Objective: The study aims to develop a digital electronics kit and information literacy to improve student performance in terms of validity and reliability in terms of language and materials. Analyze student responses to the digital electronics kit and information literacy. **Analyze** student performance results and the relationship between variables. **Method:** The method used in the study includes the research stage. The study was conducted to determine what competency standards and essential competencies are expected. **Novelty:** Kits and information literacy were developed to support skills in facing the demands of industrial technology 4.0. Connecting students with industry through the latest kits and learning modules, strengthening the relationship between academia and industry. **Research results:** Cronbach's alpha reliability test results are higher than its fundamental value, $0.820 > 0.60$. The results prove that all statements in the information literacy variable are reliable. The analysis of student responses to devices and information literacy obtained an average value of 90%, and student performance results from several criteria averaged 87.1; the kit has a significant and positive contribution (<0.10) and a path coefficient value of 0.102. The results of data analysis have proven that information literacy has a significant and positive contribution (<0.10), and the path coefficient value is 0.077.

INTRODUCTION

In today's information age, digital technology has enormously contributed to the development of the human lifestyle. Since the introduction of transistor components in 1947, human civilization has moved due to technological developments ranging from vacuum tubes to semiconductor devices (Boylestad & Nashelsy, 2021). The presence of semiconductor technology continued to develop with the introduction of integrated circuits (ICs), which enabled automatic digital data processing in one integrated device. Information literacy has supported the development of digital technology, which is increasingly complete and easy to access through the Internet. The binary information processing must also be done according to the principle of logic gates. Encoders and decoders are vital to converting analog signals humans can receive into digital signals that computers can process. Data processing will be easier to do digitally than using the principle of analog signals that are more susceptible to interference and are inefficient (Bednarkiewicz et al., 2023; De & Bazil Raj, 2023; Habich & Beutel, 2024; Safari & Pourrostam, 2024). Because of the importance of knowledge about digital electronics principles, the Digital Electronics course is one of the compulsory courses in all study programs at the Faculty of Engineering, State University of Surabaya. Bachelor of Electrical Engineering Education is the right study program to observe learning

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