

Development of Automatic Water Filling and Capping Machine Trainer Kit Controlled Programmable Logic Controllers with Supported Mental Revolution Charged Learning Module in Vocational High Schools

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ABSTRACT

The objectives of this study include: (1) producing PLC controlled automatic water filling and capping machines as trainer kits; (2) know the automatic performance of PLC controlled water filling and capping machines as trainer kits; (3) know the level of automatic feasibility of PLC controlled water filling and capping machines as trainer kits for PLC Practice learning in Vocational Schools; (4) produce a PLC Practice module containing mental revolution in Vocational Schools; and (5) knowing the feasibility level of the PLC Practice module with mental revolution in Vocational Schools.

The type of research used in this study is research and development which refers to the ADDIE model according to Robert Maribe Branch. The research steps taken in this study include: (1) needs analysis; (2) design; (3) manufacture; (4) performance testing; (5) revisions based on the results of testing performance; (6) validation carried out by media experts, material experts, and students; (7) revisions based on the results of expert and student validation on the prototype of automatic PLC controlled water filling and capping machines as trainer kits; (8) design; (9) manufacture; (10) validation of media experts, material experts, and students; and (11) revisions based on expert validation and students about PLC practice learning modules with mental revolution for PLC Practice learning in Vocational Schools. To search for data is done by observation, with the instrument in the form of an observation sheet. Instruments before use need to be tested for validity and reliability first. The data analysis used is descriptive.

The results showed: (1) Automatic Water Filling and Capping Machine Trainer Kits have been produced which have main parts namely: Conveyor Unit, Water Filling Unit, Water Capping Unit, CP1E N40 PLC OMRON Unit, Trainer Component Unit and Terminal Block Input / Output ; (2) Automatic Water Filling and Capping Machine Trainer has good performance as indicated by 100% component test items and function tests can work well; (3) Automatic Water Filling and Capping Machine Trainer Kits are very suitable to be used in learning as indicated by the validation of media experts, material experts, and students having an average value of 89.97%; (4) a PLC learning module with mental revolution has been produced, consisting of learning module I and learning module II; and (5) Feasibility test on PLC revolutionary mental learning practice module conducted by media experts, material experts, and students shows an average value of 80.44% which falls into the category of proper use.

Kata Kunci: *water filling, capping machine, trainer kit, PLC, module.*