



Development of Instruments to Measure Automotive Electrical Competency

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ABSTRACT

Objective: Competence is an individual's ability to do a job adequately and appropriately. Competence is needed in the field of work. Future vehicles are currently heading towards electric-based vehicles. Therefore, graduates who have competence, especially in electricity, are needed. Valid and accurate measuring instruments are needed to determine a person's competence. Therefore, in this study, instruments were developed to measure student competence in automotive electricity. **Method:** The research method used is a development study using a 4D model consisting of four phases: Defining, Designing, Developing, and Disseminating. The finished instrument is validated and tested to see its validity and reliability. **Results:** This study obtained automotive electrical competency instruments in 3 instruments, namely to measure knowledge, skills, and attitudes. There is 1 question item that must be dropped because the CVR value and correlation test items are below 0.3, and the outfit and infit values are above 2. No question items are dropped for instruments, indicators, attitudes, and skills. All automotive electrical competency instruments produce reliable instruments. **Novelty:** a unique instrument that focuses on automotive electrical competence. This approach includes knowledge, skills, and attitudes towards technological developments.

INTRODUCTION

Vocational education is integral to the education system in providing learners with practical skills and knowledge to prepare for workforce entry. This education focuses on teaching specific skills and knowledge relevant to a particular industry. Around the world, vocational education has been recognized as a key pillar for addressing the skilled labor shortage and meeting the demands of an ever-growing job market (Ariyani et al., 2021). One of the challenges of vocational education is technological advancement. VHS graduates must be able to follow these developments by preparing the knowledge, skills, and attitudes needed by the world of work (Wagiran et al., 2020). This aligns with Rojewski's opinion that vocational education is highly challenging in developing, adapting, or redesigning strategies to address the needs of work and society. In addition, the challenge of vocational education is the stigma of society that still considers vocational education as a second choice compared to formal education is also an obstacle (Danilov, 2022; Kholifah et al., 2022). This results in prospective students' lack of interest in vocational education, even though the industrial sector requires a workforce with specific skills. Therefore, collaborative efforts between government, industry, and educational institutions are needed to improve the quality and relevance of vocational education so that it can meet the demands of a dynamic market (Kilag et al., 2023; Maryanti et al., 2020; Munir et al., 2022; Ozer, 2021; Suharno et al., 2020). Vocational High School (VHS) graduates should be able to start their

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