

Design and Development Power Generation Mock-UP Trainer

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Abstract: *This study aims to design and develop a Power Generation Mock-Up Trainer for educational purposes at Surigao del Norte State University (SNSU) and other State Universities and Colleges (SUCs) and training centers in the Philippines. The trainer enhances electrical students' cognitive and tactile skills, addressing challenges faced by automotive technology students in wiring and connecting actual electrical circuits. The Power Generation Mock-Up Trainer simulates real-world scenarios, allowing students to work with realistic components and systems to develop competency and practical analytical skills. The revised trainer improves upon the existing alternator model by directly coupling the battery to the alternator, with the engine operating at variable speeds during battery charging. This design adjusts the direct current voltage output based on data from the battery management system. The product design and development process includes data collection, design, testing, and revisions, culminating in the final product. Test results show that the trainer is 94% effective in simulating industrial electrical installations (Elfizon, et al., 2019). By providing a versatile and durable learning tool, the trainer helps students understand power generation and battery management in dynamic conditions. This innovation bridges the gap between theoretical knowledge and practical application, preparing students for industry demands and enhancing learning outcomes.*

Keywords: Power Generation, Mock-up Trainer, Prototype