Development of Conventional Car Retrofitting on Body Cars in Supporting the Acceleration of Electric Transportation in Indonesia

by Dr. Ir. Zainal Arifin, M.T.

ABSTRACT

The 2022 Vocational Matching Fund activity was carried out by Yogyakarta State University with the title "Development of Conventional Car Retrofitting on Bodywork Cars in Supporting the Acceleration of Electric Transportation in Indonesia". The activity begins with a discussion and division of tasks in the implementation of activities which include 5 main activities, namely: 1) analysis of electric motor production, 2) analysis of battery pack production, 3) analysis of production of battery charging systems, 4) chassis and vehicle body manufacturing, and 5) analysis of vehicle testing. The analysis of the production of electric motors is carried out by reverse engineering the electric battery components, then a simulation is carried out. Implementation of simulations using the UNY Wates vocational campus computer inserted in automotive design courses and hybrid electric vehicle courses. The implementation involves partners in validating the use of electric motorbikes with the vehicles that are made. There are no obstacles in this activity because of the availability of computers and adjustments to the semester learning plans (RPS) that support this activity.

Analysis of battery pack production is carried out by designing battery requirements and designing the shape of the battery pack that is placed in the electric car. Battery pack analysis includes an analysis of the electricity demand and operating temperature of the battery. There were no obstacles in the implementation of this activity because it was supported in lectures on electricity and automotive electronics. Charging system analysis was carried out to obtain the efficiency of the charging process from a manufactured electric car prototype. The manufacturing process is carried out entirely at Partner's place, PT. Tunas Bahana Sparta, Cirebon. Manufacturing implementation is carried out for 2.5 months / 10 weeks. The manufacturing process covers the manufacture of car chassis, car body, steering system, brake system, suspension adjustment, to the electric car electrical installation process. The supporting courses in this manufacturing process include Engineering Drawing, Automotive Industry Management, Vehicle Body Technology, Basic Forming Technology, Power Transfer Systems, Steering, Brakes and Suspension. Partners support from the manufacturing aspect of making chassis and body to maximize results and share knowledge with students. Partners involve as many as 10 manpower people in the manufacturing process and for all activities carried out by 39 students.

Achievements for all activities have been implemented 100%, with the creation of electric car prototypes, simple patents, draft publication of analysis results, to teaching modules in implementing lectures in industry. With the implementation of lectures in the industry, all activities do not experience problems due to the support of lecturers, partners and students who follow the planning process to assembling electric cars.

Kata Kunci: *electric car, retrofit, vocational matching fund*