

AC 2007-664: A COLLEGE-UNIVERSITY PARTNERSHIP FOR DEVELOPING A LEARNING ENVIRONMENT FOR HYBRID ELECTRIC VEHICLE TECHNOLOGY

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A College-University Partnership for Developing A Learning Environment for Hybrid Electric Vehicle Technology

Abstract

This paper describes a college-university joint project supported by the Advance Technology Education (ATE) Program of the National Science Foundation (NSF) for developing a learning environment for hybrid electric vehicle technology. The partnership was established between Macomb Community College (MCC) in Warren, Michigan and the Division of Engineering Technology at Wayne State University (WSU) in Detroit, Michigan. WSU has developed a set of short courses for community college instructors and automotive engineers, and MCC becomes the first community college in the state – and one of the only in the nation – to train automotive technician students on servicing HEVs.

Given heightened concerns over the environmental and limited fossil fuels, a clear trend toward hybrid electric vehicles (HEV) is emerging. Hybrid electric vehicles are different from traditional automobiles in that an HEV utilizes two propulsion systems in its powertrain and involves high electrical voltage. Automotive service technicians must possess HEV-specialized knowledge acquired through additional training in order to service these vehicles. This training includes safety, regulations, control systems and propulsion systems. Currently, automobile manufacturers are training their HEV automotive service technicians entirely “in-house,” which limits the number of automotive service technicians available for the growing hybrid market. There is a clear need for a systematic training program on HEV. The goal of the project is to fill this need by developing an integrated learning environment for HEV technology.

In order to develop this program, a partnership was formed between faculty of MCC automotive technology program and the engineering technology program at WSU. The partnership also includes industrial partners from major automobile manufacturers and suppliers. The activities for the project include (1) Developing an HEV curriculum and integrating it with the existing Associate of Applied Science program in Automotive Technology; (2) Revising existing courses and developing required HEV specific courses; (3) Creating an HEV specialized laboratory; (4) Developing a two-day short course on HEV technology available for distance learning; (5) Developing and delivering seminars and workshops for different groups of audiences, including K-12 teachers, (6) Creating internship and co-op opportunities, plant visits, and an expert lecturer series; (7) Initiating a pilot program for Automotive Service Excellence (ASE) certification in hybrid vehicles; and (7) Providing transfer student advising by university faculty.

The project activities, including the development of the HEV curriculum, the two-day short courses, the symposium and workshops, will be presented. The lesson learned through the college-university partnership will be discussed.