

Abstract for Poster on Fluid Power Training

How the Mechatronics Education Center uses Innovative Professional Development Activities to Build a Stronger Technical Base in Nebraska Secondary Schools

Central Community College (CCC), with campuses in Columbus, Grand Island, and Hastings, Nebraska, worked with national and local business, education, and government leaders to create the Mechatronics Education Center (MEC). Briefly stated, Mechatronics is the integration of mechanical, electrical, computer, and control system technology. The MEC provides state-of-the-art technical training, with a particular emphasis in industrial automation, to individuals in the education and business sectors. Elements of this theme have been presented more than 285 times to over 14,000 people in ten different states and Europe. The MEC project's objectives, activities, and deliverables represent a comprehensive strategy to build capacity within community colleges and high schools; thus, supplying industry with an increased pool of skilled technicians.

The partnerships among secondary and post-secondary schools, two-year community colleges, four-year universities, business and industry, and the public workforce system enabled the MEC to be a critical economic and workforce development tool in the region's labor market. The MEC professional development opportunities for educators have enabled schools to grow students' awareness and interest in technical careers available in Nebraska.

CCC will provide insight into how it successfully administers capacity building activities with secondary and post-secondary organizations. More than 200 high school and college educators have participated or are scheduled to participate in a wide-ranging series of professional development activities with the MEC. Individuals will learn about how the MEC:

- established collaborative partnerships with 13 businesses and 24 high schools in Nebraska.
- provided sustainable, technology-based programs for 155 faculty in 341 days of professional development from more than 60 high schools and colleges. The MEC features "train-the-trainer" professional development workshops utilizing simulation software and lab equipment which emphasizes fluid power as part of a technology education. Through its partnership with the Festo Corporation, FluidSim P and H and FluidStudio P simulation software packages, along with other simulation software programs, have been used to teach fundamental pneumatic, hydraulic, and electrical principles. These same software packages also have been used by hundreds of students in the classrooms of 24 MEC partner high schools in Nebraska.
- facilitated "Return-to-Work" externships with 64 educators and 21 Nebraska manufacturers and, in turn, produced a series of replicable problem-based learning activities for mathematics, science, business, and industrial technology subject areas which are available at www.mechatronics-mec.org.
- expanded its MEC outreach capabilities through its partnerships with the University of Nebraska system and the Peter Kiewit Institute. These groups partnered with local school districts, and the Nebraska Department of Education to offer a Summer Robotics Institute in June 2009. Lessons developed in the SRI will become a part of a National Science Foundation library of science, technology, engineering, and mathematics resources. The MEC and its partners are also working with the NSF to build a series of real-world lessons which will increase student participation and success in entering high-demand technical careers throughout Nebraska.