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Manufacturing Simulation Technology Project

NSF Grant in conjunction with Mott Community College

The U.S. manufacturing industry is facing a critical shortage of the manufacturing simulation expertise required to develop innovative products for the global market. Without the skills, industry faces significant challenges in using advanced technology, securing skilled workers, dealing with the strain of global competition and addressing ever-shortening “time-to-market” issues.

Only agile manufacturers who effectively utilize human and technical resources to meet market expectations will survive. Companies must be able to design, manufacture and deliver innovative products to the consumer at a competitive price.

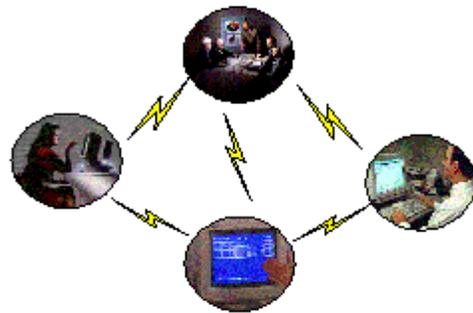
Realizing that refining traditional manufacturing processes will continue to provide only marginal improvements, industry has embraced “virtual manufacturing” (VM) and modeling and simulation (M&S) concepts. Their ability to reduce product development time and project launch errors enables manufacturers to shorten the design and delivery cycle of new products to remain competitive.

While these emerging technologies hold great promise, however, no curriculum exists at the community college level that integrates manufacturing and simulation skills to prepare technicians for the 21st Century workforce. Recent developments in “user-friendly” hardware and commercial software will result in a major shift creating positions

for the simulation technician that were once restricted to the post-graduate engineer.

With the availability of today’s commercial simulation software associate

LEARNING METHODOLOGY INTEGRATION w/ MANUFACTURING TECHNOLOGY



degree engineering technicians will be able play a key role in the manufacturing simulation workforce.

Traditionally, engineering technicians collaborate with engineers and scientists to support research and development activities. In manufacturing they generally assist in product design and development, process design and manufacturing/production planning.

While it is possible to qualify for some engineering technician jobs without formal training, most employers prefer at least a two-year degree. This is especially true for CAD design personnel. Simulation software

Mission: ■ Be a focal point for the expanding modeling and simulation community ■ Develop and conduct M&S research and related services ■ Identify M&S directions and trends ■ Facilitate moving M&S into new areas ■ Be a research and development access point to industry for technology transfer ■ Create and participate in partnerships ■ Provide an environment conducive for student and faculty participation in M&S research and development ■ Provide continuing education services.

developers, such as Deneb and Tecnomatix, state that growth in the simulation field will ultimately lead to a shift that transforms CAD design personnel into simulation modelers. They predict that one of every five to ten CAD positions will become simulation positions in the next five years. Using a 1996 estimate of 310,000 drafting/design/CAD positions, this shift would result in the development of 31,000 to 62,000 new simulation positions.⁸

Mott Community College, in partnership with IST, will bring key partners from academia, industry, and government together to develop a tech prep curriculum for a manufacturing simulation technology (MST) associate degree. This outcome will be achieved by developing and implementing an integrated curriculum model that combines core math, science and technology concepts with proven emergent technologies in simulation, network communication infrastructure and digital information processing.

The MST associate degree program satisfies a major employer requirement and positions graduates for high-tech jobs developing in the simulation field. The focus of this project will be on applications related to the automotive industry. Once the initial core curriculum is fully developed, materials will be adaptable to suit the needs of other industry sectors such as aerospace, entertainment and maritime.

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