

2006-901: MADE IN FLORIDA: A STEM CAREER OUTREACH CAMPAIGN

Marilyn Barger, University of South Florida

MARILYN BARGER is the Executive Director of FL-ATE, the Florida Regional Center for Manufacturing Education housed at Hillsborough Community College. She earned a B.A. in Chemistry at Agnes Scott College, and both a B.S. in Engineering Science and a Ph.D. in Civil Engineering from the University of South Florida. She has over 15 years of experience in developing curriculum in engineering and engineering technology and is a registered professional engineer in the State of Florida.

Eric Roe, Hillsborough Community College

ERIC A. ROE is the Director of FL-ATE, an NSF Regional Center of Excellence in Manufacturing Education. He received his Ph.D. in Chemical Engineering from the University of South Florida (USF). During his time at USF, he has researched fluidized bed drying, been a consultant to the Citrus Industry, worked on Florida Department of Citrus research projects, and the High School Technology Initiative - funded by NSF. Prior to USF, he was employed as a technologist in Research and Development at Tropicana Products, Inc. with process and product development responsibilities. His research interests are food engineering, fluidized bed drying, and the integration of engineering and education.

Richard Gilbert, University of South Florida

RICHARD GILBERT is a professor of Chemical Engineering in the College of Engineering at the University of South Florida. He has developed educational materials for ISA (Instrument Society of America), AVS (American Vacuum Society) Science Educator's Workshop, and the National Science Foundation through a grant to develop high school science and math curriculum content. He is currently working with D. L. Jamerson Elementary School to develop curriculum content for its Center for Math and Engineering.

Bradley Jenkins, St. Petersburg College

BRADLEY JENKINS, is the Director of the Engineering Technology program at St. Petersburg College. He has developed engineering technology related curriculum and course content for the last twenty years and is the director of the Engineering Technology Form for the State of Florida. He holds a B.S. Degree in Engineering Technology from the College of Engineering at the University of South Florida and is a Co-Principal Investigator for the NSF-ATE regional center for manufacturing education in Florida, FL-ATE.

Andrew Hoff, University of South Florida

Made in Florida: a Dynamic STEM Career Outreach Campaign

Marilyn Barger and Eric Roe, Bradley Jenkins, Richard Gilbert

Hillsborough Community College/ St. Petersburg College/ Univ. of South Florida

Introduction

FL-ATE (Florida Advanced Technological Education Regional Center for Manufacturing Education) was created in 2004 through a National Science Foundation Advanced Technological Education grant. The center is one of 32 Centers for Excellence in the United States focused on improving science, technology, engineering, and mathematics education to meet the technician workforce needs of American advanced-technology industries. One aspect of this mission for all the NSF ATE Centers including FL-ATE is recruiting students into technology career pathways. FL-ATE is housed at Hillsborough Community College in Tampa, Florida and serves the entire state's manufacturing and related technologies education programs. The center has many ongoing outreach activities, which include: 1) promotion of technologically oriented manufacturing careers to middle and secondary school students, 2) professional development of teachers throughout the K-12 educational system, and 3) review and reform of the State's Community College manufacturing education programs. This paper and poster will detail how and what FL-ATE's outreach activities including production and distribution of a recruitment video, tours for students and teachers of local manufacturing facilities, development and distribution of virtual tours, manufacturing challenge lessons, and teacher and faculty workshops.

Manufacturing Facility Tours [“Made in Florida” Tours]

FL-ATE employs two outreach managers (one full time and one part-time) who network in the local communities with manufacturers, professional organizations, and all levels of educational organizations. In 2005, a partnership with the economic development organization, the Florida High Tech Corridor Council (FHTCC), and Regional Manufacturers Associations (RMA's) provide the financial resources to help FL-ATE to take 694 students and 32 teachers throughout a 21 county region in central Florida on tours of manufacturing industries in their communities. The FHTCC through the RMA's provides the funds for bus transportation and substitute teachers if needed. The RMA's strongly promote manufacturing outreach and help to mobilize support for the tours with their membership. FL-ATE coordinates the tours and develops the educational support materials for students and teachers. The FL-ATE outreach managers identify the schools and specific class or classes, works with the teachers who will go on the tour. They also work directly with the industry partners to be sure the tour is a meaningful experience and contains several essential components. Each tour provides an overview of Florida Manufacturing careers, a prelude of the facility and its product(s) and a focus on a particular technology that is integral to the particular site. The company host must also provide access to employees at various levels in the organization who can talk to the students about working in the manufacturing industry. The FL-ATE outreach managers also organize the transportation, personally pick up the students and escort them to and during the tour site with the teachers and/or counselors. The outreach managers also follow up with separate surveys for the companies, teachers and students for feedback and continuous improvement. FL-ATE began its second year of tours in January 2006 with

increased funding from the FHTCC and increased interest and participation from Manufacturers.

A review of the student surveys from the first year tours reveals that the tours had a positive effect on the students' views of technical careers. Prior to the tour, 34% of the students had considered careers in manufacturing, after the tours that number rose to 49%. Additionally, after the tours, an astounding 80% of the students felt that they would be interested in engineering or professional level technical careers and 94% wanted to pursue a high-skill, high-wage career. The tours also seem to have impacted the students' views of math and science education. After the tours, 79% stated they understood the importance of mathematics and science at work and 82% felt that the tour helped them to understand the use of math, science, and technology in industry.

“Made in Florida” Promotional Video

FL-ATE realized that getting the students interested in manufacturing as a good and lucrative career pathway is only one piece of the awareness and recruitment puzzle, and that parents and the entire local community must be made aware that manufacturing industry provides challenging, state-of-the-art technology jobs with high wages. To address this larger audience, FL-ATE produced a 22-minute video, “*Made in Florida*” that discusses the breadth of manufacturing while highlighting the products and components that are produced in Florida. Four industry sectors are highlighted: Medical Devices and Instruments; Food, Beverages, and Pharmaceuticals; Electronics and Technical Instruments; and Metals and Plastics Fabrication. With the help of regional manufacturers associations, FL-ATE identified and visited manufacturing facilities throughout the state that would allow photographs, filming and employee interviews. The upbeat video highlights the array of products made in rural and urban areas of the state, the diversity of production industries, and interviews of young people who like working in the industry and see it as a secure, challenging, and financially rewarding career.

In December 2005 “*Made in Florida*” was premiered at the Second Annual Florida Manufacturing Summit before an audience of 225 people. As stated by the executive director of the Manufacturers Association of Florida (MAF), Nancy Stephens, “Our Audience of legislators, manufacturers, workforce professionals, economic developers, and providers of goods and services for the manufacturing industry found the DVD dynamic, exciting, motivating, informative, and very appealing to young people.” MAF is currently looking for ways to partner with FL-ATE to disseminate the video throughout the State of Florida. A streaming version of the video and document files of the script in both English and Spanish, are available on the FL-ATE outreach website, www.madeinflorida.org.

Regional “Made in Florida” Rollout Events

The DVD has been duplicated for distribution via the regional manufacturing associations in Florida. Each organization has been asked to host an event, invite teachers, counselors, manufacturers, economic development professionals, and other interested persons to a *Made in Florida* rollout event. This event will feature the video and the Made in Florida website as resources for student and employee recruitment and public awareness of the importance of manufacturing in the state. Several events have been scheduled for the spring of 2006 in

conjunction with regional manufacturing association and/or workforce boards. Participant organizations at these events will each receive a copy of the DVD.

“Made in Florida” Website

As realized in the creation of the “*Made in Florida*” video, in order to attract a workforce to manufacturing, outreach activities need to target more than just the students. In order to reach these “gatekeepers”, FL-ATE decided to expand the “*Made in Florida*” concept to become the public service banner for a coordinated statewide web-based awareness campaign to attract Florida students to careers in manufacturing. This initiative is being spearheaded through the web-presence www.madeinflorida.org. This website is quickly becoming the key awareness instrument for Florida Manufacturing Workforce and Education Development for the following target audiences: students, teachers, faculty, counselors, and parents.

Several features of the website are discussed below in more detail. Additionally, the website features links to websites that help students assess their skills, likes and dislikes, and tendencies. Relevant and fun websites that are good resources for students to explore manufacturing and manufacturing careers are also included. Direct links to community colleges in Florida that offer manufacturing and/or related programs of study can also be found.

“Made in Florida” Virtual Tours

Several obstacles arose in trying to schedule student tours of manufacturing facilities. Obstacles from the facilities point of view included timing, safety issues, confidentiality, size of tour group, and availability of personnel. At the school level, getting the students out of the classroom also has some obstacles, including: available time away from school, scheduling, focus on standards and benchmarks, alignment with curriculum, transportation, and substitute teachers. To reach more students, FL-ATE is developing a series of virtual tours. These are multimedia packages consisting of audio with either video or slideshow images of various Florida manufacturing facilities. These virtual tours allow the students to explore the manufacturing environment either from their classroom or home. They are particularly useful for students in rural areas of the state that do not have manufacturing sites in their community and for the exploration of manufacturing sectors not located locally.

“Made in Florida” Learning Challenges

To supplement the “*Made in Florida*” tours, video, and virtual tours, FL-ATE has created curriculum modules for classroom or personal learning. These content rich materials are designed to excite students about the interconnection among science, technology, engineering and math as related to manufacturing. They are based on discovery, problem-based, and inquiry-based learning models and are based on real problem at real manufacturing facilities in Florida. Each module contains: challenges for the student, notes for the instructor, solutions to the challenge, a company profile, and relevant tutorials. One tutorial features Feathelite, a company that manufactures luxury coaches in Lake Mary, Florida. The challenge for this company is the layout of a particular coach given the size and design constraints of how many rooms, specific additions (plasma TV), etc.

Manufacturing Career Pathways

A flowchart style education and career pathway has been developed that is appropriate for Manufacturing and other technical career pathways. This career pathway has several levels inviting students to consider career opportunities in manufacturing companies that are not necessarily directly related to production of goods. We are also developing career pathway examples from real people and will highlight the paths they have taken to get to their current positions. These examples will highlight the breadth of opportunities in manufacturing companies. In its final version, this career pathway will be interactive online and a single click will take curious students to new pages of information about the educational level they click on or the career ladder they are interested in. A sample of the career pathway flow diagram is presented at the end of this document.

Conclusion

Behind every product you use, every food you bite into, and every technology you turn on, there is a world of Manufacturing. Today, technology and global economic competition are combining in unprecedented ways to change work and redefine the American workplace so that manufacturing jobs are technology jobs. Attracting a new generation of students onto this Science, Technology, Engineering and Mathematics (STEM) pathway is critical. Not only for the success of the students as they enter the workforce, but for the success of America’s economy. The “Made in Florida” campaign introduces students to the STEM career path through Manufacturing. It provides: students with tools to make education and career decisions; educators with tools to enhance their classroom experience; and gatekeepers such as parents and counselors, with the information they need to understand this dynamic career cluster.

The effort has brought economic development organizations, workforce agencies, educational institutions, and professional associations together to support a common goal. With our partners in community colleges across the state, local school districts, the regional manufacturing associations, the Florida Department of Education Community College Division and the Manufacturing Association of Florida, FL-ATE is beginning to make a significant impact.

