Three M’s: Manufacturing Extension Program, ManufactureNJ Talent Network and MechaForce

Meeting the High Tech Workforce Needs of NJ Manufacturers
Manufacturing’s resurgence in the U.S. is not yet assured, but in New Jersey, with its 11,000 manufacturers including 400 in Newark, the probability of a renaissance is maximized by NJIT’s 3-M’s which together are adapting the German dual skills education model to the State’s ecosystem. National and local elected leaders capture why this is important.

Manufacturing is in the DNA of NJIT ever since Newark was recognized as “America’s fourth largest manufacturing city.” Today, advanced manufacturing abounds with numerous breakthroughs including products made by robots, artificial intelligence machines and 3-D printing. Such innovations require professionals with advanced degrees in Science, Technology, Engineering and Mathematics (STEM). The key discipline in manufacturing associated with STEM is Technology (T). According to the NJ Department of Labor (LWD), “42% of advanced manufacturing workers are directly involved with production,” making the “T” the catalyst for the creation of largest number of jobs. Without the technologists to design and operate the equipment, manufacturers cannot make products. In New Jersey, NJIT is the only four-year college offering a B.S. in Engineering Technology with the applied approach that parallels the German dual skills model.

The 3-M’s are working together to realize NJIT’s strategy to focus on talent development to drive growth in the “T” for manufacturing.
As the oldest and most mature of NJIT’s 3-M’s, NJMEP began in 1996 with initial funding from the U.S. Department of Commerce/NIST and now is self-sustaining. NJIT continues to be represented on its Board. MEP focuses on professional development training to New Jersey manufacturing managers in cost saving strategies such as lean manufacturing and business process improvements, as well as conducted approximately 15,000 days of training for manufacturing owners and decision makers. The current Metrics Report from NIST has MEP nearing $3 billion in positive impact since 2000, including increased and retained sales, cost-savings and capital investments. (Refer to Table 1.)

 MEP is a strong supporter of the annual National Manufacturing Day. MEP also collaborates with many organizations and partners with the ManufactureNJ Talent Network (MNJ) during National Manufacturing Week.

MANUFACTURENJ TALENT NETWORK (MNJ)

Established in 2011 after being awarded a grant from NJLWD, NJIT is the steward for this industry cluster connecting industry with educators, job seekers and the public workforce system. NJ’s website states, “As technology plays an ever-more important part in manufacturing...the Advanced Manufacturing Talent Network is NJ’s main tool in the strategy to bring together all stakeholders in this endeavor.” The Fourth Annual NJ Manufacturing Week kicks off at NJIT on September 28, 2015, with the conclusion on October 2 co-hosted by MEP. (Refer to Table 2 to review MNJ’s Accomplishments.)
To overcome the reluctance of adolescents, professionals and displaced workers to consider advanced manufacturing as a career, MNJ introduced “Dream It. Do It.” (DIDI)—a program created by the Manufacturing Institute (MI). Using DIDI tools, and support from Sandvik Corporation, MNJ hosted a week-long “Young Manufacturers Summer Academy” at NJIT for 22 Newark middle and high school students who attended workshops and performed hands-on advanced fabrication while learning about the educational pathways to manufacturing.

MECHAFORCE—MECHATRONICS ACADEMIC AND TRAINING PROGRAM

MechaForce is an innovative, statewide initiative adapting the German dual skills apprenticeship model to the task of developing a new industry-driven mechatronics curriculum for the NJ’s manufacturing and educational ecosystem. It’s a one-year old stand-alone derivative of MNJ with a “Shaping Talent with and for NJ Advanced Manufacturers” mantra. Led by NJIT, MechaForce is funded by Sandvik Corporation, Norwalk Design, Baumer of America, BASF, GEA Mechanical Equipment US, Inc., Goya, Stryker Orthopeadics, Medin Corporation and Triangle Manufacturing, each contributing $20,000 annually to its operation.

Four benchmarks characterize MechaForce’s new industry-driven, “portable and “flexible” collegiate-level mechatronics curriculum that provides a structured and sequential educational apprenticeship and career pathway:

1. Industry certification.

2. A.A.S. degree in Mechatronics from Thomas Edison State College and other state community colleges with similar A.A.S. degrees.

3. Jobs for the learners at those same manufacturers who volunteered to assist in developing the curriculum. These companies know the learners have the appropriate skills to start work immediately because they also received practical experience while earning their degree.

Table 2. Selective MNJ Accomplishments for Year 4 (2014–15)

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<th>Connecting with Companies, Job Seekers &amp; Educators</th>
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<tr>
<td>• Met with 80 employers re talent needs</td>
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<td>• Ran 3rd Annual MNJ Industry Week for 400 attendees</td>
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<tr>
<td>• Met with 1900 job seekers</td>
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<td>• Attracted 93% new visitors to MNJ website</td>
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<td>• Grew LinkedIn group 21%</td>
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<td>• Obtained $15k grant for Young Manufacturers Summer Academy</td>
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<td>• Launched Dream It/Do It in NJ to change perceptions of career</td>
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<th>Outcomes</th>
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<td>“From 2013–14, sector experienced its best year since 1990, having lost only 700 jobs. As of July 2013, when, overall, NJ lost 26,000 jobs, manufacturing job losses have stabilized and some areas had growth.”</td>
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Data and quote from LWF/chieft data analyst

This up-tick can be attributed in part to MNJ’s impact.

“The skills required of the future workforce are changing. To address this challenge, I am assembling a High Tech Education Taskforce, Co-chaired by Mr. Campbell [Eastern Millwork CEO] with Vice President Gall Spak of NJIT to design a pilot program for Jersey City students to enter the workforce with technical competencies.”

Steven Fulop
Jersey City Mayor
State of the City Address
February 2014
4. With no academic credit transfer loss, NJIT’s B.S. degree in Engineering Technology/Mechatronics can study part-time in an “earn while you learn” mode.

Appendices 3.2 and 3.3 present the required competencies and resulting curriculum.

MechaForce’s approach has already been diffused in nine NJ counties where specific educational institutions committed to create a manufacturing talent pipeline. As Appendix 3.3 indicates, there are currently 465 learners who are potentially part of the MechaForce-generated talent base.

MechaForce has inspired partnering schools to purchase and install training/education facilities so that learners can acquire “hands-on’ skills on equipment mirroring that of advanced manufacturing. Moreover, MechaForce hired two full-time professionals - a director funded by manufacturers and a tenure-track mechatronics assistant professor funded by NJIT. Furthermore MechaForce is committed to deploying MNJ’s DIDI program as its core recruitment tool with MEP and MNJ representation on its Board of Directors.

How well the 3-M’s pro-actively, deliberately and creatively link and leverage each other’s unique assets is best demonstrated by a NJBIZ “Spotlight on NJ” special section focused on “Made in NJ—Manufacturers Focused on Long-Term Workforce” on June 29, 2015. NJBIZ is a daily newspaper read by over 56,000 business leaders. The 3-M’s are also collaborating on MNJ’s Fourth Annual Industry Week in September 2015.

Each of these initiatives, separately and together, holds the key to talent development for New Jersey’s manufacturers as well as lifelong employability for our residents at acceptable living wages. We envision the 3-M’s becoming the foundation to inform and spark a new model for the rebirth of this industry sector, not just in New Jersey, but across the United States.