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From the Desk of Jack Healy

## A New Vision for Engineering Recruitment

By Jack Healy, Director, MassMEP

A recent **National Summit on American Competitiveness** was held in Washington D.C. The focus was on the premise that "Education provides the foundation for innovation, and innovation will be the engine for manufacturing."

Nice premise, but it assumes that we will or can have sufficient people with adequate educational levels entering the future manufacturing workforce. It also assumes that this workforce will support sufficient levels of innovation-based growth in the US manufacturing base.

The problem is that all of the recent educational emphasis on STEM (Science, Technology, Engineering, and Math) promotion in the educational infrastructure, along with "No Child Left Behind," may be steps in the right direction. But these policies and programs do little to change the current and future needs of the US manufacturing community and the urgency with which we must develop, implement, and support innovation.

While there has been widespread research on future needs, many national associations, such as the National Association of Advanced Manufacturing (NACFAM), have conducted studies that conclude that manufacturing as a whole will be facing a "demographic tidal wave in which we are starting to see thousands leaving the work force, particularly in manufacturing jobs that will send a crash of endemic proportions to firms in need of high skills talent."

### Searching for Qualified Employees

But here's a challenge. In Massachusetts, there is a draft STEM Plan to Action that does NOT include manufacturing as an industry in need of a STEM trained workforce. There does not seem to be the same sense of urgency to understand future manufacturing needs as there is to deal with current needs.

One of basic engineering professions to support innovation is design engineering. If you Google 'Design Engineering Jobs' in each of the New England States you will get the following number of individual listings:

***Design Engineering Jobs  
by State***

***Number of Google  
Listings***

Connecticut	9,950,000
New Hampshire	8,260,000
Massachusetts	6,680,000
Vermont	2,900,000
Maine	2,430,000

The data isn't the only indication of our dramatic current needs. Ask anyone who manages a manufacturing enterprise and you will find that they are always searching for skilled employees to fill job vacancies. Surveys have shown that over 70% of local manufacturer's capabilities have been negatively impacted due to a lack of critical skills such as CAD/CAM operators (the supporting level for design engineers).

Despite what should be a loud wakeup call for the industry, given high current demand for such positions as design engineers, there is still a lack of interrelationship and cooperation between the manufacturing and educational communities. This is a necessary next step if we hope to address the problem. Manufacturing design engineering graduation rates at our public institutions of higher education (at least for Massachusetts) continue to deteriorate to 60% of what they were 10 years ago and they show no indication of changing their downward spiral.

### **No Longer Need to Hire US Citizens**

The large manufacturing organizations (firms with more than 500 employees) that traditionally were able to promote the need for, and hire, engineers to meet their requirements, have for the most part evolved to become global companies with a global perspective. Such companies no longer have to make investments in local, US educational communities as the global marketplace provides a very competitive education system, producing all kinds of graduates in the manufacturing sciences.

The chairman of Intel, Craig Barrett, recently stated, "Intel could continue to be successful if they never hired another US citizen." We should expect that Intel is not alone in this belief.

Where does this leave the remaining 98% of the manufacturing community, the small manufacturing companies (under 500 employees) that must compete on value rather than on price? Such manufacturers are now faced with the opportunity of solving this design engineering deficit with their own resources. This will necessitate proactive market practices and participation in [Secondary and Postsecondary Learning Options \(SPLO's\) and Tech Prep](#) activities that will engage students as early as the seventh and eight grades.

Prevalent figures state that only 70% of the current student population completes high school. Of this 70%, only 53% enter college directly from high school and of this group only 35% receive degrees. This means that manufacturing is competing for the necessary engineering skills within less than 19% of the available student population each year. Good luck with that!

## **Manufacturers Must Work With Educators**

The alternative to such a process is for manufacturers to collaborate with their local education systems. Firms that personally reach out to the schools and give the students in the 7th and 8th grades the opportunity to imagine a different future, usually have success in their own future recruitment. Such firms usually have videos or DVD's of their companies that provide students with "a vision." This is needed because most children have pretty much made up their minds, in at least in a general way, as to what they would like to do in the future by the time they get to high school or at the very least, what they do not want to do. Due to the negative perception of manufacturing, we are high on the list of careers to NOT consider. Waiting until high school or college to recruit your future workforce candidates is often too late.

## **Filling in the Gaps in Education**

SPLO and Tech Prep activities can be easily supported through a manufacturing collaborative of internships, part time jobs, or mentor participation that connect the high school student with the world of work. This provides real experiences that are missing in today's high school education.

The high school level of Tech Prep can also be supported by the local community college system providing college level credited courses through distance learning or onsite teaching that can link secondary education with continuation for two year or four year schools.

Our past experience working with such manufacturing collaboratives has shown that the manufacturers who provide scholarships are usually the most successful in recruiting the student candidates with the necessary skills. Scholarships, which are reasonably priced at the community college level, provide a degree of motivation and learning that ensures accelerated paybacks for the providing company. This is especially true when the student knows that they have a job waiting for them upon graduation.

## **Two Year vs Four Year Degrees**

We would also like to provide some background to eliminate any possible myths that may surround the validity of a two year engineering degree. Research by the Pratt School of Engineering of Duke University found in a survey of 58 US corporations engaged in outsourcing engineering jobs that the majority of these firms did not mandate a job candidate possess a four year degree. Forty percent frequently hired engineers with two or three year degrees. Seventeen percent hired similar candidates if they simply had the necessary experience.

A three year Skills Improvement program conducted for four year degreed engineers by the Massachusetts and Maine MEP involved over 1,600 types of manufacturing engineers in several hundred companies. The program found an additional population of approximately 300 successfully working engineers who possessed no formal educational degree. When examined, the real world always seems to correct many misperceptions.

There is a readily available vehicle that can help -- your local Work Force Investment or Regional Employment Board. They can assist in the development of educational collaboratives. We have seen how well the Hampden County and Central Mass Regional employment boards have done in facilitating activities between the educational and manufacturing communities to provide the necessary learning programs for critical manufacturing skills.

Anyone needing more information on Education Collaboratives can contact Ted Bauer at (508) 831-7020 or by e-mail at [tedb@massmep.org](mailto:tedb@massmep.org). Ted is currently working with Quinsigamond Community College and the Central Mass Regional employment board, assisting in the facilitation of the **Central Mass Technician Collaborative**.

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