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Successes, Opportunities, Recommendations – Skills Based Educational Needs of Connecticut’s Manufacturers

In considering what models are being successfully implemented to create ‘employable’ graduates there are essentially two categories – one consists of existent educational models and the other industrial partnerships and outreach models. These will be discussed for both the high school and college programs separately. These are models that the NHMA endorses.

Overall Objective: To engender a system and network that will create a STEM skilled, critical thinking, functional workforce through industry involvement that will open doors to opportunities, provide expertise, and nurturing to the students, faculty, and administrators.

It is important note that NHMA recognized this need early on and has been active in implementing successes and strategies long before CASE’s advocacy of the need for education – industry partnerships in its report that was released on January 17, 2013

1) Educational

- a) Agriscience and Technology – 19 centers, 4,000 students – local oversight
- b) Technical High Schools – 20 schools, approx. 10,000 students – state centralized board oversight
- c) Career and Technical Education – included in selected comprehensive high schools

2) Common Characteristics

- a) Experiential Learning opportunities
- b) Strong and active industrial advisory committees
- c) Seek to provide ‘lifelong employability success’ skills
- d) Create educational community clusters
- e) Immersion in the application of STEM fundamentals
- f) Standardized test scores exceed those in their DIRG (education shed area) – this is exceptional because technical high schools have 90 days of academics and 90 days of applied technology.
- g) Higher college matriculation rates

3) Successful Industry Partnership Models – NHMA Example

- a) Participation with 3 Technical and 2 Agriscience Schools
- b) Members of advisory committees
- c) Provide ad hoc and specific funding that can serve unfulfilled needs
- d) Recognize faculty and student achievements
- e) Advocate for funding, equipment, and facilities as needed – e.g. Rep. DeLauro's earmark funding for Platt and Eli Whitney Tech.
- f) Invite key administrators and faculty to NHMA meetings
- g) Invite key commissioners and administrators as luncheon speakers
- h) Hold meetings at partnering schools
- i) Sponsor a minimum of 3 students and one faculty member at the yearly meeting and provide table top display space.
- j) We co-sponsored a very successful 'solid works program' of study with the Adult, Continuing, and Summer Education Program of Regional High School #5 that trained 7 employees of member firms in this cutting edge skill set. Another offering is planned for this spring and we believe this is the first time such a partnership with a comprehensive high school's continuing education program has been made.
- k) Leadership role in designing and implementing a Materials Manufacturing Teaching Institute in partnership with SCSU focused on providing New Haven and Bridgeport middle school science and math teachers with exposure to how STEM is utilized to create everyday products.
- l) Student and teacher internships

4) **Higher Education** – 2 year, 4 year programs

5) **Basic Observations Regarding Challenges**

- a) Over the past 50 years we have transitioned from a faculty that had strong industrial experience and expertise with strong ties to all facets of the state's industrial base to a faculty that has spent its career essentially in the 'halls of ivy' performing research and not being in the frontline of industrial problem solving nor understanding the needs of the state's diverse industries.
- b) A faculty with a strong basic research focus tends to drive its undergraduates into the same mindset thereby creating graduates who may be ill suited to fit the needs of many employers.
- c) The average employer in the State of Connecticut employs 35 people, therefore they are in need critical thinking, flexible, action oriented problem solvers. (Siemon Story)

- d) Industry is bound by many regulations ,two sets for example, environmental (40 CFR) and OSHA (19CFR) specify a plethora of training requirements but also certifications and licenses which are needed to perform certain tasks. These are usually not recognized as priorities by many of the college programs - 2 or 4 year. For example, unlike my era, engineering students today are prepared for or encouraged to pursue an Engineering License, even though the need for one is stipulated in both 19 CFR and 20CFR for many industrial scenarios.
- e) One of the most successful programs that we have had has been all but forgotten. Its fundamentals have, in part, been recreated in the new community college manufacturing and technology programs – e.g. Gateway and Housatonic however it would be beneficial to revisit our former Technical College Program, that possessed a highly successful curricula but was unfortunately transitioned into the community college system and so diluted that nary a vestige of it exists today.

6) Recommendations

- a) 5 year follow up studies of graduates to determine not only student success but also what needs to be done to make the academic program more relevant. Agriscience has been doing this for years – as required by state statute. This needs to be a universal requirement at all levels.
- b) Greater focus on credentialing at all levels. Just look at the universe of credentialing required in many professions, credentialing has become the key to employability.
- c) Include the needs of all strata of industry in academic relationships and not the needs of the same large employers while the needs of the majority of industry – which are small entities – are ignored.
- d) Require more state college faculty outreach to the full spectrum of Connecticut industry commensurate to the taxpayer support they receive. i.e. the state in-general needs to benefit more from state faculty expertise than it presently does.

7) NHMA and Colleges

- a) We actively support and work with Gateway and Housatonic Community Colleges in the formation and implementation of their Manufacturing Programs – from participating on advisory committees, to lecturing to their students, to providing plant tours.

- b) We have had ad hoc meetings with faculty and administrators at the University of New Haven and Quinnipiac University regarding new programs and jointly sponsored programs.
- c) We serve on advisory committees such as the applied Physics Advisory Committee at Southern Connecticut State University.
- d) We include college faculty and administrators in our mailings and issue invitations to our meetings.
- e) We speak to college classes about industry expectations, needs, and opportunities.

8) Final Retrospective

There appears to be an education institution roadblock regarding end user/career provider input and involvement in the academic process. If there is any substantive change made, it needs to foster more dialog and collaborative functioning between academia and industry so that we can continue to engender and create the Eli Whitney's, Igor Skiorsky's and Bill Gates' of the future.

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1/31/13