Supporting Economic Development: Community College Support for 'Specialized Training'

During the summer and fall of 2005, the Center for Regional Economic Competitiveness (CREC)—with support from the US National Institute of Standards and Technology (NIST) Manufacturing Extension Partnership (MEP)—surveyed the nation's 1,013 community colleges to better understand their role in regional economic development. More specifically, CREC sought to better understand community college efforts to provide courses and curricula designed specifically for individual firms or groups of firms. Frequently, these programs are offered under a contract with private industries, via appropriated state funds, or through other contracts with state agencies. This report refers to these custom-designed, industry-targeted courses and curricula as "specialized industry training."

Based on an extrapolation of data from this survey, an estimated six percent of the US population enrolled in a community college program last year. As a result, community colleges represent a vital component of the US workforce development system, providing trained workers and training capabilities for a broad swath of the US economy. Although many community colleges equip workers with basic skill sets, most community colleges offer specialized training to support their region's industries. The survey results revealed that industry needs do indeed drive the demand for—and design of—specialized training.

In an era of tight budgets for higher education, specialized training is attracting greater resources. Moreover, over half of the survey respondents expected a budget increase for specialized training during the coming year. Notably, manufacturing industries are prime beneficiaries of these efforts. This report summarizes the survey findings and provides information on just how important community college industry-specific training is to the success of the US economy, especially the manufacturing sector.

Methodology

CREC developed a two-page survey containing 14 questions about a variety of issues ranging from community college enrollment to the nature of specialized contract training programs offered. The survey sponsors, NIST MEP was particularly interested in learning about training provided for US manufacturers and to learn more about the relationship between communities colleges and their respective state's Manufacturing Extension Partnership program. [1]

[1] *State MEPs are known by different names in different states; they provide technical assistance targeted to small manufacturers. More information can be found at http://www.mep.nist.gov.*

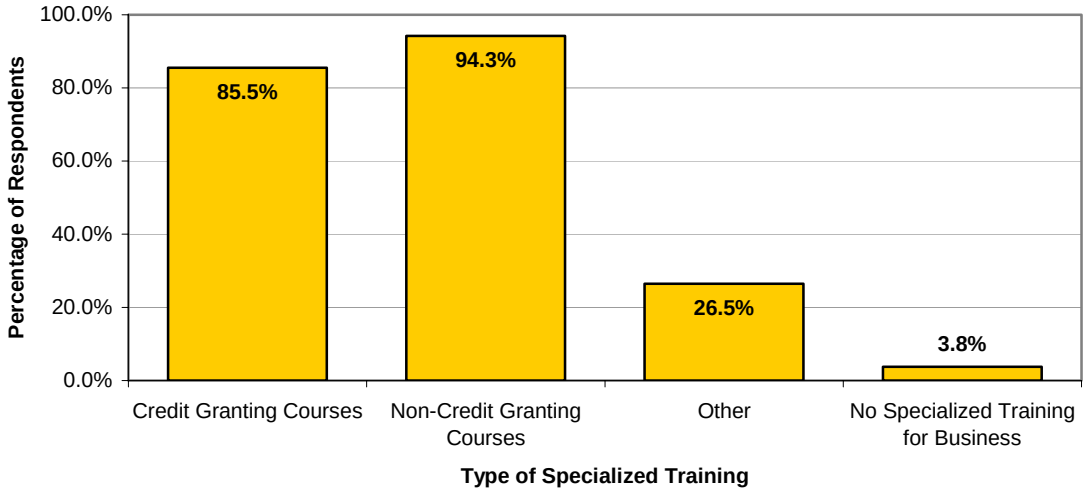
The American Association of Community Colleges (AACC) assisted in the survey process by reviewing the survey instrument, endorsing the project, and providing a list of the nation's 1,013 community college presidents. CREC mailed the survey in June 2005 and conducted a follow-up in July 2005. A total of 400 surveys were received for a response rate of 39.5 percent. CREC received responses from community colleges in 46 of the 50 states.

Community Colleges and Specialized Training

In academic year 2004-2005, the responding colleges averaged 16,660 enrollees. These figures represent a duplicated head count in which the total number of people enrolled in one or more programs are counted. The count includes those individuals enrolled in non-credit training courses. Extrapolating from this mean, CREC estimates that last year the nation's community colleges served approximately 16.8 million people. That figure represents roughly six percent of the US population.

The preliminary results indicate that community colleges nearly universally provide some form of specialized training, either through credit granting and non-credit granting courses or both. In fact, less than 4 percent of the responding colleges indicated that they do not offer any specialized training. Figure 1 shows that an overwhelming majority of community colleges offer some kind of specialized training, with 94.3 percent of colleges offering it through non-credit granting courses and 85.5 percent of colleges offering training through credit granting courses.

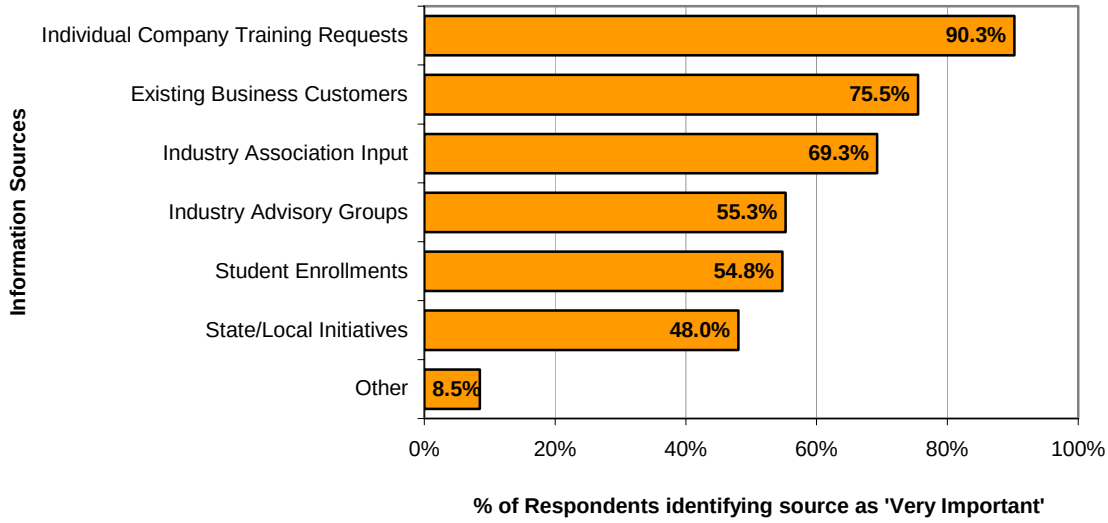
Figure 1: Methods for Offering 'Specialized Training'



Course Offerings

Industry plays an important role in guiding college course offerings. Figure 2 illustrates that firms provide the most important source of ideas for course offerings. Over 90 percent of the respondents indicated that individual company training

Figure 2: Information Sources Guiding Course Offerings



requests were 'very important' in determining their course offerings. Three-quarters of the respondents noted that existing business customers were very important. Conversely, course offerings seem less driven by student demand or state and local government demands. Slightly more than half the respondents rated student enrollments as a 'very important' source of ideas for determining which courses to offer while less than half rated state and local initiatives as 'very important.' Even though state and local initiatives and student enrollment numbers influence whether a college offers training, requests from companies, especially existing customers, have a much stronger influence on college training program offerings. Consequently, future efforts to change or improve the methods through which community colleges deliver specialized training must clearly incorporate private sector input.

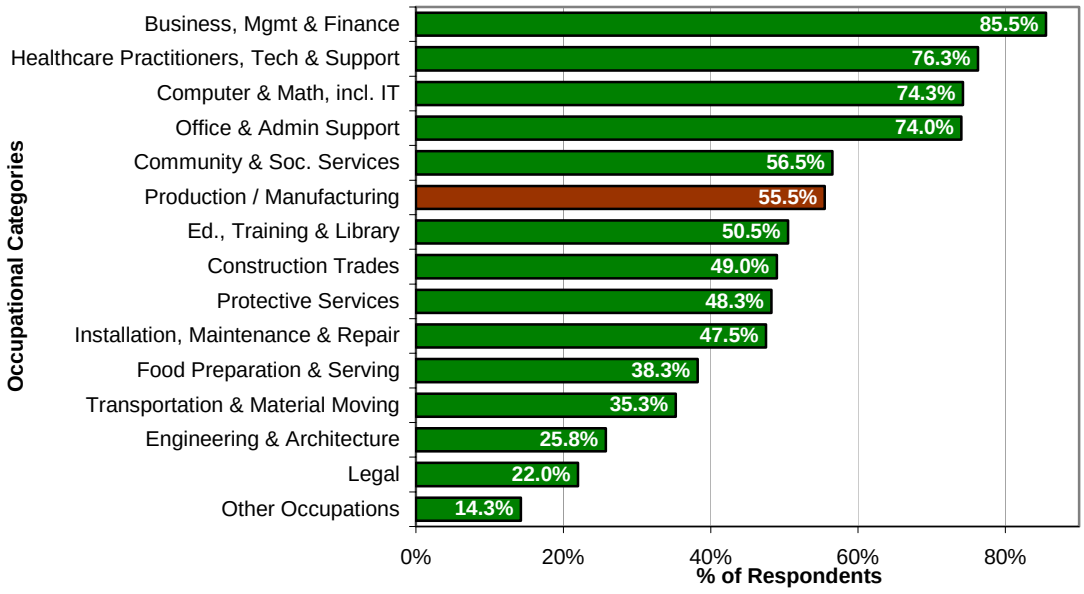
On average, nearly 3,400 students participated in specialized training over the last year. By extrapolating these figures, CREC estimates that community colleges provide specialized training for approximately 3.45 million students nationwide. Thus, about 20 percent of community college students are enrolled in company-specific training. This represents a significant portion of the community college enrollment base.

As demonstrated in Figure 3, colleges are more likely to offer specialized training in certain occupational categories. According to the survey, training programs for business, management & finance-related occupations were the most commonly offered. Approximately 75 percent of all responding colleges offered specialized training for occupations in three other broad categories—healthcare practitioners, technicians & support; information technology (IT) & math; and office & administrative support. In particular, the growing demand for health services nationwide fuels much of the demand for healthcare practitioners.

Two key factors explain the popularity of business, IT and administrative support-related training programs. First, most every type of business requires workers with these skills. Second, colleges can readily afford to offer the programs because the training requires very limited investments in equipment beyond computers. Some training programs are limited in their availability because they require access to state-of-the-art equipment that can be quite expensive to acquire. Few colleges receive any more per student from public funding sources (such as state appropriations) for training in these fields.

Production and manufacturing-related occupational training is an area that is frequently inhibited due to inadequate access to state-of-the-art equipment. This category still finished as the 6th most common training program offered at community colleges. More than half (55.5 percent) of the responding colleges indicated that they offer specialized training for production or manufacturing workers. These programs tend to be smaller than many other programs because they tend to be more specialized. The average community college provides training for about 860 students of production occupations last year. This suggests that about 871,000 students enrolled in production or other manufacturing-related programs nationwide. This figure constitutes roughly 6 percent of all manufacturing workers and about one quarter of all the students involved in specialized training nationally. Not surprisingly, larger community colleges were more apt than smaller colleges to have the budget for specialized manufacturing training programs. Almost two-thirds of respondents with headcounts over 20,000 have specialized training for manufacturing related occupations. Conversely, 42.3 percent of colleges with a head count under 5,000 offered similar training. This trend indicates that barriers to entry—such as the high equipment costs or difficulty in finding qualified instructors—

Figure 3: Types of Specialized Training Offered



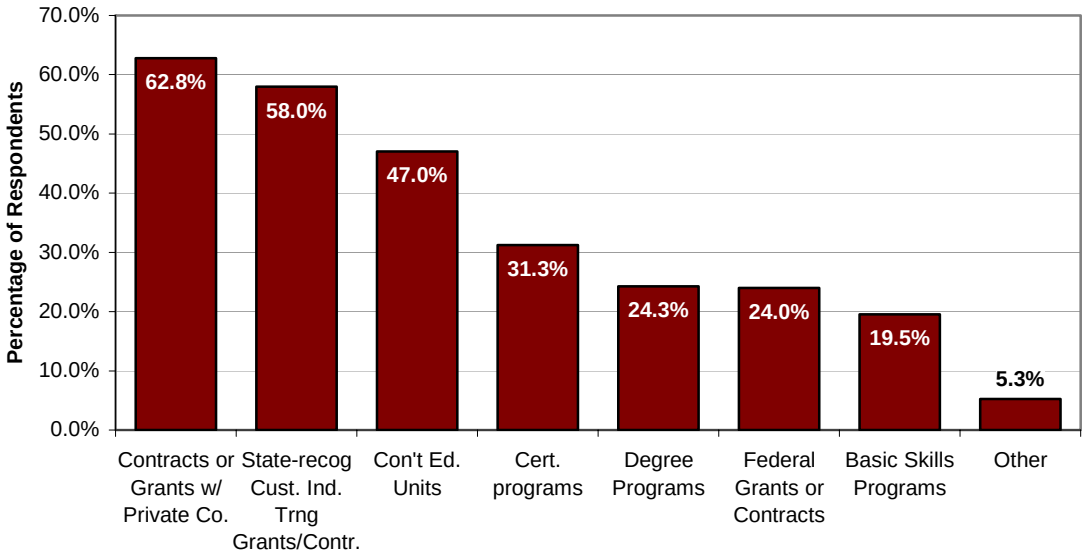
may exist for community colleges seeking to provide specialized manufacturing-related training.

Another finding from the study was that fewer than half the community colleges have training for vocational occupations such as the construction trades, protective services, and maintenance/repair. Each these technical occupation categories are adding employment and increasing demand for more highly skilled technical workers.

Budgeting for Specialized Training

Industry drives the selection of specialized training courses because it is a key funding source. As shown in Figure 4, almost 63 percent of survey respondents indicated that contracts or grants with private companies provided one of their key sources of funding for specialized training courses. The second most cited specialized training funding source was state-provided customized industrial training grants or contracts. Federal grants or contracts fund less than one-quarter (24 percent) of specialized training initiatives. Also, about one-fourth of the programs received part of their funding through budget line items for degree programs or basic skills courses.

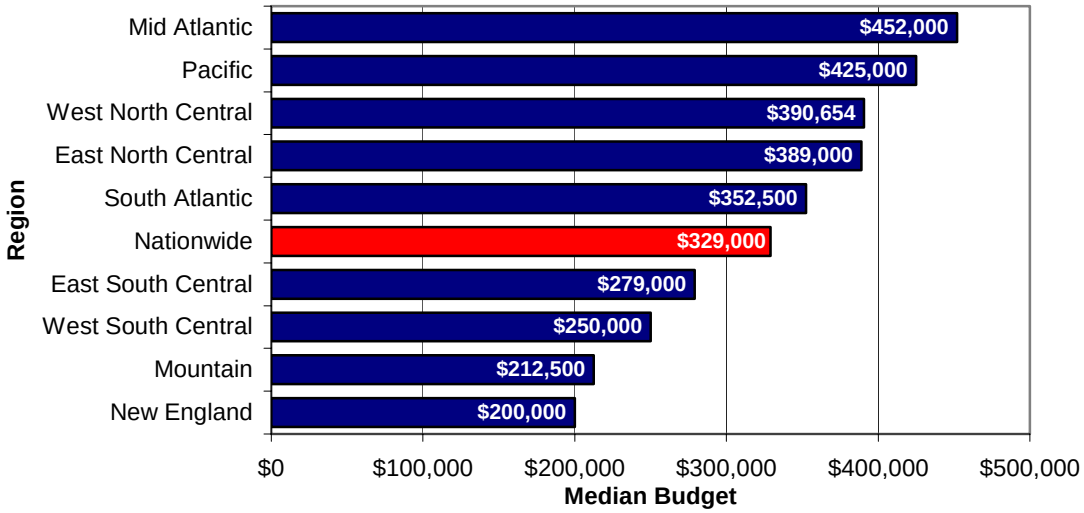
Figure 4: Funding Sources for Specialized Training



Respondents were also asked their total budget for specialized training during the most recent academic year. The mean annual budget for the 292 respondents that provided information was $1,035,991. By extrapolating this information to the 96.2 percent of community colleges that offer specialized training, CREC generated an estimated total investment by community colleges of $1 billion for specialized training programs last year. This estimate is influence significantly by several very large programs. By way of comparison, the median budget for the 292 respondents

providing budget information was $329,000. Median budget sizes varied according to the respondent's geographic location. Figure 5 illustrates these differences according to geographic regions.[2] Respondents from the Mid-Atlantic and Pacific regions both had median budgets over $400,000. Conversely, the Mountain and New England regions had the lowest median budgets at $212,500 and $200,000 respectively.

Figure 5: Median Budget for Specialized Training by Region



Respondents were also asked to project how their budget for specialized training was expected to change over the next year. Only 6 percent of respondents indicated that they planned to decrease their budgets for specialized training. Almost 53 percent of respondents indicated that they were planning to increase their specialized training budgets in some amount. Nearly half of this group expecting an increase (or 26 percent of all respondents) indicated that they were anticipating a budget increase of greater than 10 percent. This pattern held steady for larger colleges as well as smaller ones.

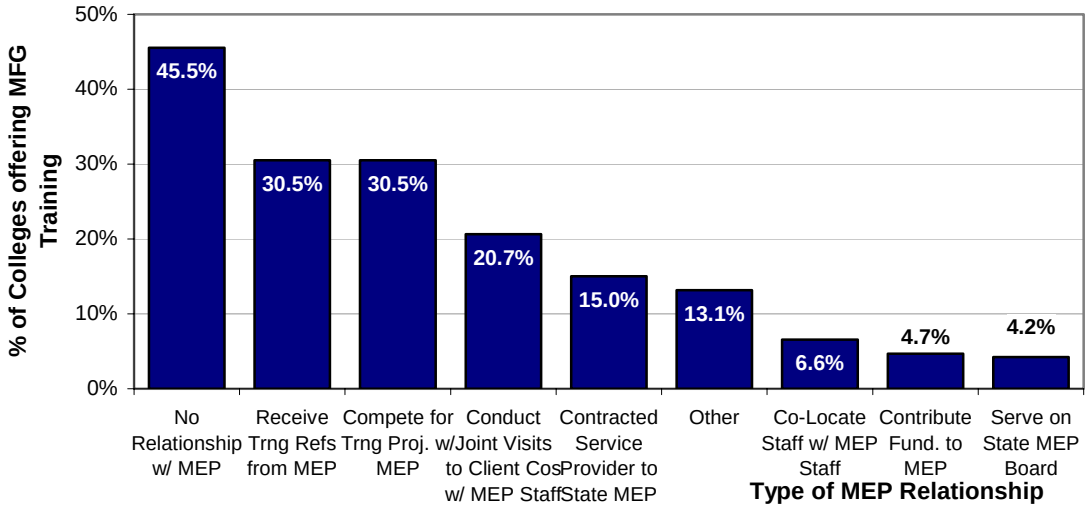
Community College Relationships with Manufacturing Extension Partnerships

The community colleges were also asked more specifically about the manner in which they support training for area manufacturers and their relationship with other stakeholders involved in providing assistance to manufacturers. In particular, the survey asked respondents to describe their relationship with their state's MEP. In analyzing these results, CREC examined only the responses from the 213 responding colleges that offered specialized training for students seeking to enter manufacturing and production-oriented occupations. The current responses to this question are

[2] *The nine regions used for this analysis are the regions used by the US Census Bureau. New England includes ME, NH, VT, MA, RI and CT. The Mid Atlantic region includes NY, NJ and PA. The East North Central includes OH, IN, IL, MI and WI. The West North Central includes MN, IA, MO, ND, SD, NE and KS. The South Atlantic region includes DE, MD, DC, VA, WV, NC, SC, GA and FL. The East South Central includes KY, TN, AL and MS. The West South Central region includes AR, LA, OK and TX. The Mountain region includes MT, ID, WY, CO, NM, AZ, UT and NV. The Pacific region includes WA, OR, CA, AK and HI.*

shown in Figure 6. Almost 54.5 percent of the colleges providing manufacturing-related training indicated that they had a relationship of some kind with their state MEP. Many reported that they receive training referrals, conduct joint visits to client companies, serve on the MEP board, or co-locate staff with the MEP. Some also reported that they compete with the MEP or have some other relationship. Larger colleges were more likely to have some kind of MEP relationship.

Figure 6: MEP Relationship w/ Colleges offering MFG-related Training



In addition, a few of the responding colleges offering manufacturing-related training have a much closer relationship with their state MEP than others. For instance, nearly 7 percent co-locate staff with the MEP, 5 percent contribute funding to the state MEP program, and 4 percent serve on the MEP statewide board of directors. Several colleges provide illustrations of these relationships. Jefferson State Community College (AL) and Greenville Technical College (SC) both co-locate staff with their state MEP and serve on the state MEP board. South Suburban Community College (IL), Fox Valley Technical College (WI) and Lakeshore Technical College (WI) all co-locate staff and contribute funding to their state MEP. Given their relatively active involvement with their state MEP, the experiences of these colleges may provide examples of successful practices in building collaboration between specialized community college training programs and state MEP technical assistance efforts.

Other trends emerge when we examine the MEP relationship through a multi-state regional perspective. Table 1 reveals the regional differences between survey respondents offering manufacturing-related training by region. Colleges in New England, the Mid Atlantic, the East North Central, the West North Central and the East South Central were most likely to have a relationship with their MEP stakeholders. In each of these locations, half or more of the respondents had an MEP relationship. This proves somewhat unsurprising given that these are the

Table 1: MEP Relationship by Region for Colleges offering MFG Training

Region	Compete	Yes	No Relationship	% With an MEP Relationship	% w/ competititve MEP Relationship
New England	3	7	1	87.5%	42.9%
Mid Atlantic	9	17	8	68.0%	52.9%
East North Central	10	19	7	73.1%	52.6%
West North Central	7	17	12	58.6%	41.2%
South Atlantic	14	28	30	48.3%	50.0%
East South Central	4	11	8	57.9%	36.4%
West South Central	4	9	12	42.9%	44.4%
Mountain	1	2	5	28.6%	50.0%
Pacific	4	6	11	35.3%	66.7%
Unknown	0	0	3	0.0%	
Total	56	116	97	54.5%	48.3%

country's traditional manufacturing regions. Slightly less than 50 percent of the respondents in the South Atlantic region had a relationship with MEP, but that number increases to more than 75 percent for colleges outside North Carolina. Areas where manufacturing was a relatively smaller segment of the state's economic development efforts, such as the Western and Mountain states, had a lower percentage of respondents with an MEP relationship. The Mountain region was the lowest, with less than 30 percent of respondents indicating an MEP relationship.

The survey shows that many colleges receive training referrals from their State MEP. This represents the most frequently cited type of MEP relationship. Over 30 percent of the colleges offering manufacturing-related training received training referrals from their State MEP. More than 20 percent of colleges conducted joint visits to client companies with their MEP staff, while another 15 percent indicated that they were contracted service providers for their State MEP. These activities play an important role not only in actual training but also in making area manufacturers aware of the services available to them.

A number of the respondents—approximately one-third, indicated that they had a competitive relationship with their state MEP. This figure accounts for over 48 percent of all the respondents that indicated that they have a relationship with their state MEP. According to the survey results larger colleges—particularly those that serve more than 20,000 annually—are more likely to have a competitive relationship. Regionally, over half of the respondents from the East North Central, Mid Atlantic, New England and Pacific regions indicated that they had a competitive relationship with their State MEP. The Pacific region had the highest percentage of competitive relationships with 66.7 percent of all those respondents with an MEP relationship. The community college-state MEP relationship was least competitive in the East South Central region with only 36.4 percent. About half of the colleges in the South Atlantic region reported a competitive relationship with their state's MEP, but it represents an interesting issue because one state has such a large influence on the findings. About two-thirds of North Carolina colleges reported that they compete with the NC State University Industrial Extension Service thereby increasing the

proportion of South Atlantic colleges reporting a competitive relationship to 50 percent.

Special Initiatives Supporting Area Manufacturers

The survey also asked respondents to identify any special initiatives that they have implemented in the past year to respond specifically to local manufacturers' needs. Figure 7A displays these results. The most common initiatives were related to Workforce Safety, for which over half of the respondents had a program. Lean Manufacturing and Quality Assurance and Control (including ISO) were the next most common responses, respectively.

Figure 7A: Special Initiatives in Support of Area Manufacturers (All Respondents)

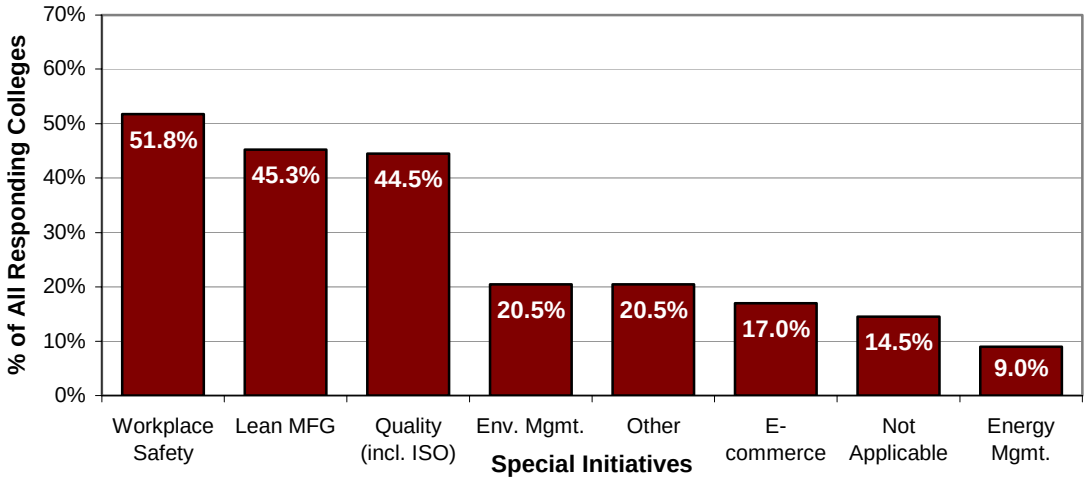
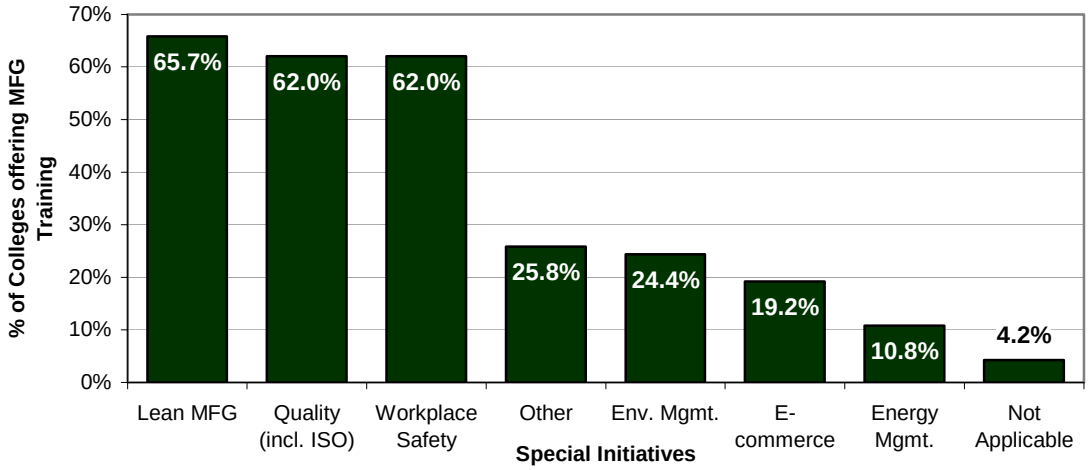


Figure 7B: Special Initiatives in Support of Area Manufacturers (Respondents who offer MFG-related training)



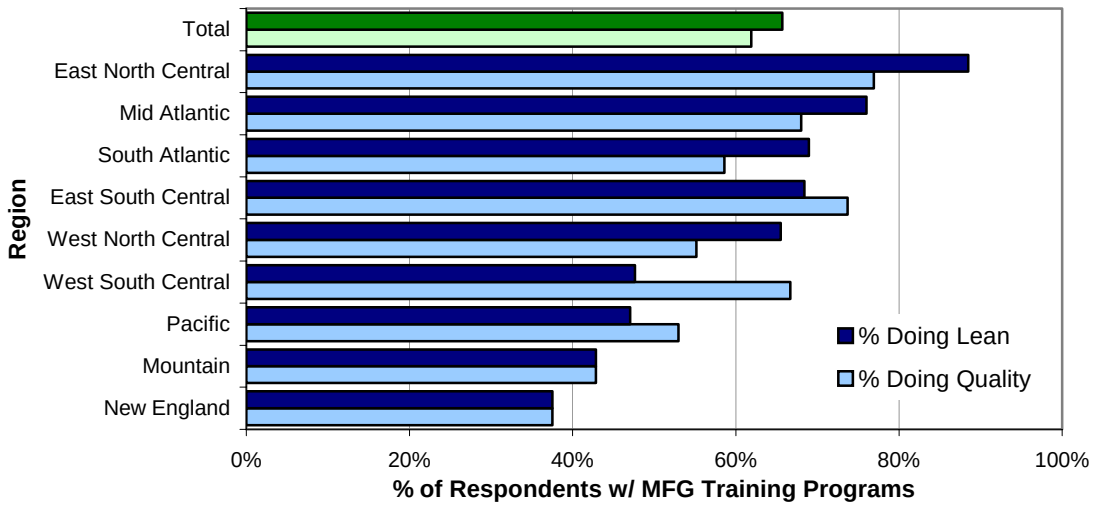
These results change somewhat when considering just those colleges offering specialized training related for manufacturing and production-related occupations. These results are displayed in Figure 7B. Among colleges offering manufacturing-related training the most common responses were Lean Manufacturing, Quality Assurance and Control (including ISO) and Workplace Safety, respectively. More than 60 percent of the respondents offering manufacturing-related training indicated that they offered training related to one of these initiatives. In particular, lean and quality programs represent important initiatives to move US manufacturers toward the adoption of more technology advanced production processes, as well as improving their global competitiveness.

Just as larger colleges are more likely to offer specialized training for manufacturing-related occupations, so too are they more likely to offer lean manufacturing and quality assurance training programs. Over two-thirds of colleges that offer manufacturing-related training with more than 20,000 students offered such programs.

As displayed in Figure 8, regional differences also exist. Over 60 percent of the colleges offering manufacturing-related training in the Mid Atlantic, East North Central, and East South Central's responding colleges offered Lean and Quality training. Conversely, less than 40 percent of responding New England colleges with manufacturing-related training offered either lean or quality training. Other initiatives such as e-commerce and energy management proved much less common with fewer than 20 percent of the colleges offering these programs.

The survey also asked community colleges to identify any specialized programs designed to train students for the skills necessary to work with 'cross cutting' technologies such as nanotechnology or biosciences. Only one out of three

Figure 8: Lean & Quality programs in Colleges offering MFG training



respondents indicated that they offer programs related to these cross-cutting technologies. Over half of this subset of training programs was related to biosciences or biotechnology – the most common cross-cutting technology initiative. This accounts for 17 percent of all respondents. North Carolina provides one example of these bio-tech related programs. The North Carolina Community College System (NCCCS) increased its capacity to support the biotechnology industry by launching the NCCCS bionetwork.[3] NCCCS designed this network to provide an opportunity for colleges to offer specialized training for an array of industries including biotechnology, life sciences and pharmaceutical industry. North Carolina currently has six centers that focus on different aspects of the biotech sector, including bioprocessing, bio-education, pharmaceuticals; bio-agriculture, and bio-business. These centers represent a strategic attempt to coordinate the state's resources in support of an emerging cluster.

Nanotechnology programs represented the next most frequent cross-cutting technology with 7 percent of all respondents. Dakota County Technical College (DCTC) in Minnesota offers an associate degree program in nanoscience technology. The National Science Foundation provided a portion of the seed funds used to launch the program. The program prepares students for careers in fields like nanoelectronics and nanomaterials, and also prepares students for further education through its partnership with the University of Minnesota.[4] Nanoscience initiatives tend to offer alternate tracks for students who wish either to go either directly into industry or to continue their education at a four-year institution.

Another frequently cited cross-cutting technology training program offered by colleges is alternative energy. Almost 5 percent of the colleges indicated that they offer renewable or alternative energy programs. For example, Bronx Community College (NY) offers a Solar Photovoltaic (PV) certificate program as part of a commitment to alternative energy. In 2005, the National Science Foundation (NSF) awarded a $900,000 grant to the college to develop and implement an A.A.S. degree in Energy Services Technology as well as to support a series of continuing education certificate courses at the college. Likewise, Cape Cod Community College (MA) established a renewable energy and training program. The latter was done in conjunction with several other higher education institutions like the Massachusetts Maritime Academy and two technical high schools, in addition to consulting with area research centers like the National Oceanic and Atmospheric Administration (NOAA) Wood's Hole Research Center. The Cape Cod program involves offering both an undergraduate certification for installers of renewable energy systems and short courses designed to 'train the trainers'.[5]

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[3] *More information is available at www.ncbionetwork.org*
[4] *http://www.dctc.edu/programs/nano.htm*
[5] *http://www.irecusa.org/articles/static/1/1091454649_987094287.html*

A fourth area that colleges identified as a cross-cutting technology is geospatial technologies and geographic information systems (GIS). About one percent of all respondents indicated that they offer training in GIS-related technologies. These programs are relatively new. For instance, Harrisburg Area Community College (PA) offers a Geospatial AA degree program. GIS skills have a number of high demand technology applications related to business marketing, transportation planning, construction, logistics, and architecture.

These cross-cutting technology collaborations can be invaluable in raising the profile of community colleges as critical resources for technology-based economic development. These programs train industry workforce in the technical skills necessary to work in many emerging, knowledge-intensive industries.

Concluding Comments

Specialized industry training programs are nearly ubiquitous among America's community colleges. These programs offer an opportunity for colleges to develop a direct relationship with local companies and to generate resources to support training activities. Increasingly, state educational systems are challenging colleges to increase their linkages with industry – to meet economic development goals, to meet statewide training/education goals, and to meet state education funding goals. With state funding increases for education at lackluster level and increased demands from industry, this represents an important tool for meeting local economic development needs.

For the manufacturing sector, these same trends apply. As manufacturing continues to become increasingly technology-oriented, it will also rely on capital-intensive equipment that will need to be continuously updated. Larger companies with the resources available to provide state-of-the-art equipment for training or with sufficient space to allow for on-site specialized training will likely have an important influence on the types of training that will be available for production occupations. The risk is that smaller colleges and smaller manufacturers (without the resources to contribute state-of-the-art training equipment to their local college) may be left behind.

Furthermore, many colleges view lean and quality training as a source of industry-training revenue. Unfortunately, a number of MEP programs are also becoming dependent on these programs for their own funding. Not surprisingly, this has led to a greater sense of competition between the two potential allies. It will be imperative for community colleges and MEP alike to diversify their contract training revenue base to other sources of funds.

With an average budget of about $300,000 per year, specialized training programs are relatively small, but they also help the colleges in tapping a substantial proportion of the US population. As continuous life-long learning becomes an ever increasing part of the American workplace, it is likely that these college efforts will

become an increasingly integral part of local economic development efforts. To be successful in meeting this rapidly growing need, community colleges will need to expand their relationships with public and private sector partners like MEP and other economic development entities. Combined, this more integrated economic development effort will help us ensure that the US has a globally competitive workforce.