BRIDGING THE GAP

KEEPING KC MANUFACTURERS COMPETITIVE

A Regional Survey and Analysis of the Needs of Modern Manufacturing

aimKC

ALLIANCE FOR INNOVATION IN MANUFACTURING KANSAS CITY

NAM National Association of Manufacturers

THE MANUFACTURING INSTITUTE

INTRO

In February 2005, the **Alliance for Innovation in Manufacturing-Kansas City (AIM-KC)** launched the **Dream It. Do It.** campaign in partnership with the **National Association of Manufacturers** and **The Manufacturing Institute**. The campaign is a national grassroots effort designed to attract young people into manufacturing careers and to expand education and training programs to meet the growing shortage of highly skilled workers.

By serving as the pilot for the campaign, the Greater Kansas City Area is at the forefront of a movement that will help ensure our nation's competitiveness and provide our region with a path for economic growth and unprecedented opportunity.

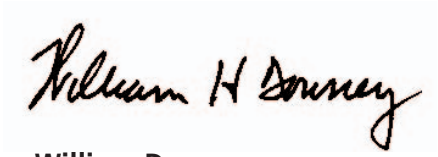
AIM-KC includes representatives from manufacturing, education, business, government, and the civic community who understand the importance of manufacturing and the role it has in the future of our region and our nation. We are working together to:

- **Create an awareness of the broad range of highly paid, interesting careers offered in today's manufacturing**
- **Align educational and workforce training resources with the most pressing demands of area industry**
- **Ensure a competitive environment for area manufacturers and expand the size of our region's manufacturing community**

Bridging the Gap provides the foundational blueprint necessary to accomplish many of our goals. To our knowledge, it is the first report that specifically addresses the primary issues facing KC-area manufacturers. It comprises the results of a survey of area manufacturers, an inventory of manufacturing-related education and training programs, and an assessment of manufacturing's workforce needs (compared to the current capacity of regional education and training providers to respond to those needs).

We have identified **six primary gaps** that – if bridged – will make a significant difference in ensuring that area manufacturers have access to the talent they need to grow their businesses. This report also contains preliminary recommendations that are being considered by key stakeholders being organized into various task force groups. An addendum will be published once these groups make their final recommendations and establish specific action plans.

Paul Scianna
Executive Director
AIM-KC



William Downey
President and CEO, Kansas City Power & Light
Trustee, The Manufacturing Institute

One of the primary goals established by the Alliance for Innovation in Manufacturing – Kansas City (AIM-KC) is to ***close the skills gap for regional manufacturers by aligning educational and workforce training resources with the most pressing demands of area industry***.

To support this goal, AIM-KC, in partnership with the National Association of Manufacturers, initiated a three-step skills gap analysis process:

- **Manufacturers Survey** – Identify the current and projected workforce needs of manufacturers through an on-line survey

- **Program Inventory** – Catalog manufacturing-related programs available from education and training providers at the secondary, two-year and four-year program levels

- **Gap Analysis** – Map current and projected workforce needs identified by the manufacturing survey against the capacity of regional education and training providers to respond to those needs

KC BRIDGING THE GAP

THIS REPORT

This report summarizes the findings of the manufacturers survey, manufacturing-related program inventory and gap analysis, prepared in conjunction with **Key Links Inc.**, an independent workforce development consulting firm. The full report of the manufacturers survey and the manufacturing-related program inventory is available through AIM-KC at **www.aimkc.org**.

OPPORTUNITY KNOCKS!

Over the next two years, 72 percent of Kansas City area manufacturers responding to the survey expect to expand their operations, and 68 percent expect to hire new workers, due to expansion, retirements and/or turnover. These numbers represent a tremendous opportunity for the Kansas City region.

This Gap Analysis identified six major gaps that, if closed, will make a significant difference in ensuring that area manufacturers have access to the skilled workers they need to grow their businesses.
Note: These are not listed in any particular order.

Gap 1: Secondary/high school programs do not support career pathways into manufacturing, and partnerships between schools and manufacturers appear weak.

Gap 2: Current education and training programs are not placing enough emphasis on such workplace basics as problem solving, decision making, team building, etc.

Gap 3: The region lacks a short-term training program in manufacturing "foundation" skills to move new employees into production jobs quickly.

Gap 4: Post-secondary programs may not be geared up to address expected hiring needs in high-demand occupations over the next two years.

Gap 5: Manufacturers need low-cost, customized training programs to upgrade the skills of their current workers, especially in supervision and workplace basics.

Gap 6: Many manufacturers in the Kansas City area are not familiar with and are not utilizing workforce programs and services available from education/training providers.

MANUFACTURING SURVEY: WORKFORCE NEEDS

An online survey was developed to help identify the current workforce needs of the manufacturing industry in the greater Kansas City area today and the projected needs over the next two years. The survey was distributed to manufacturers via several key business and education organizations.

During a two-month period (from January 28 to March 30, 2005), 190 manufacturers responded to the survey, representing approximately 10 percent of potential respondents (i.e., those who received the survey by e-mail) and approximately six percent of the manufacturing base in the surrounding 16-county area based on data from the Harris Directory. Responding to the survey took approximately 20 minutes; and responses – in almost all cases – were extremely thorough and thoughtful.

Profile of Respondents

- More than half of those responding to the survey were managers, while the owner/president/CEO completed almost one-fourth of the surveys. The balance was completed by human resource staff, supervisors, skilled-trade workers, production workers and others.

- The majority of respondents were small- and mid-sized manufacturers, with about 30 percent having fewer than 50 workers. The largest grouping of firms (39 percent) employ between 100 and 499 full-time employees, with few having more than 500 employees.

- Approximately one-fourth of those responding to the survey represent fabricated metals, with automotive/transportation and machinery comprising about 10 percent each. The balance of the 190 respondents represent chemical; computer, electronic and electrical; food; paper, printing and publishing; plastics and numerous other sectors as reflected through the indication of a primary Standard Industrial Classification (SIC) code.

- More than three-quarters of the respondents operate from a single site, with just under a fourth operating multiple sites. Companies reflect sales in all markets, including local, statewide, regional, national and international, with the majority of firms targeting national and international markets.

- **Seventy-two percent of companies responding to the survey expect to expand their operations in the Kansas City region during the next two years**, with 182 companies responding, while fewer than three percent expect to decrease or cease operations.

- The No. 1 factor identified in support of business competitiveness was improving production processes, followed closely by U.S. and global competition. At least one-fourth of the respondents cite maintaining or improving workforce skills, adding new technology, and improvement strategies and practices.

> **"The U.S. Department of Education estimates that 60 percent of all new jobs in the 21st century will require skills that are possessed by only 20 percent of the current workforce."**
>
> "Before It's Too Late," National Commission on Mathematics and Science Teaching for the 21st Century, U.S. Department of Education, 2000.

Current Workforce Needs

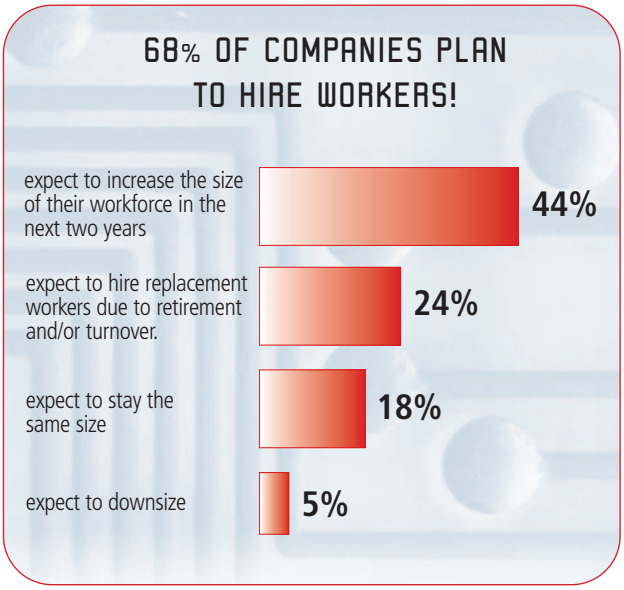
• ***Sixty-eight percent of companies expect to hire new workers over the next two years***. Forty-four percent of the respondents expect to increase the size of their workforce in the next two years, and 24 percent expect to hire replacement workers due to retirement and/or turnover. Approximately 18 percent expect to stay the same size; five percent expect to downsize; and the balance do not know or cannot predict.

• Companies expect to replace workers in a variety of occupational areas because of retirements or turnover in the next two years. These positions include, but are not limited to, area management, CNC machinists, customer service, electricians, engineers, laser operators, management, quality assurance, sales, tool makers, and welders.

• Companies expanding their workforce over the next two years will add an array of positions in a number of areas, including accounting, fabrication, foundry molders, graphics, hydro-forming, logistics, marketing, and multiple-axis laser cutters.

• The vast majority of respondents report that more than half of their workforce is involved in plant operation/production. All other major functions engage much smaller percentages of the total workforce, with computer technology and scheduling/logistics involving the smallest percentage of workers.

• The vast majority of respondents cite ***"job readiness" and "workplace basics" as the top skill deficiencies identified in the current workforce***. "Job readiness" was defined as attitude, reliability, workplace ethics, etc. "Workplace basics" includes such skills as problem solving, communication, and teamwork. Supervisory skills and shop floor management were cited by almost half of the companies. Manufacturing setup and processing and technical skills for production were identified as deficiencies by more than 40 percent of companies. Other deficiencies identified by employers include CNC machining, multi-crafting, lean manufacturing concepts, procurement/purchasing, new product development, innovation, truck drivers, and English as a second language.



• ***Almost half (49 percent) of the companies responding had partnered with a broad range of local or regional employment and training providers to provide training to address their skill shortages.***

• ***The reason cited by the most companies (39 percent) for not partnering with local providers to do training is that they were not familiar with available services.*** This was followed closely by not needing training (32 percent), concerns about time (22 percent) and concerns about costs (22 percent). Other reasons cited for not partnering to address skill shortages include personal time restraints, use of existing training programs, low-tech needs, and not offering any training.

New Hires

• Word-of-mouth and newspapers are the two most popular techniques for recruiting entry-level workers. By comparison, nearly 80 percent of the responding companies indicate that promotion from within is the most popular technique for recruiting technical or skilled labor and managerial or professional talent.

• ***One quarter of respondents use One-Stops* or high school partnerships for recruiting. Approximately 40 percent use community college or university career centers or employer associations to recruit new workers.***

• Slightly more than half of employers responding to a question on internships indicate they would be willing to serve as a worksite for interns or cooperative education students.

• Employers were asked to identify the two most significant skill deficiencies they see in job applicants. This question produced an expansive list of 50 responses that were organized into four broad categories: technical skills, workplace skills, basic skills and work ethic. ***Technical skills emerged as the top-ranking skill deficiency area for new hires, followed closely by new workplace basics (decision making, problem solving, etc.).*** Together they represent 64 percent of responses. Issues related to work ethic and basic skills comprise the balance of responses.

*The One Stop employment and job training system was authorized by the Workforce Investment Act (WIA) passed by Congress in 1998. The intent is to combine as many federal jobs-related programs as possible under one roof – providing "one stop" for prospective employees seeking career guidance, skills assessment, education and training assistance, and employment placement services.

• ***Plant operations/production and management emerged as the top trouble spots in terms of difficulty finding and hiring qualified workers from the Kansas City area,*** with about 70 percent of manufacturers identifying those areas (if ratings of "severe and moderate difficulty" are combined). Engineering, quality improvement process, and product development/design also were identified by approximately 50 percent of all firms. Only computer technology emerged as "little or no difficulty" expected in hiring.

• The primary reasons for difficulty in hiring include: skill deficiencies in the labor pool, location, image or perception of manufacturing, and maintaining competitive wages.

• Survey respondents were asked to identify the specific job titles for the first- and second-most difficult occupations/positions to fill in their companies and the three most important technical skills associated with each position. The results generated comprehensive tables of occupations and skill sets in the following areas: plant operation/production, engineering, management, marketing/sales, product development, quality improvement, and scheduling/logistics.

• More than 100 employers responded to an inquiry about the need for a short-term manufacturing training program to teach "foundation" skills. The most frequently requested content includes problem solving/decision making, teamwork, job readiness, applied math, manufacturing principles, blueprint reading, basic mechanics, and precision measurement. More than half of the respondents said they would hire graduates of such a program into entry-level positions.

Employee Training

• The majority of respondents view training as a shared responsibility between the worker and the company. The top four reasons for supporting training are productivity, avoiding problems/reducing errors, overcoming lack of skills in new employees, and maintaining competitiveness.

• Time away from the job and money/resources to fund training were cited as the top two barriers to training, followed by difficulty in finding good training providers, low employee motivation, and low employee education levels.

• About one-third of the companies have provided job readiness training (e.g., such soft skills as attitude, reliability, etc.). About two-thirds indicate they have provided workplace basics training (e.g., teamwork, customer service, etc.). More than 60 percent of that same group provided their own training. Just under 40 percent used professional seminars.

• Respondents were asked to identify the most important thing the education and training system could do to help companies sustain and grow their business. Comments were extensive, but they fell into four broad categories:

Career Awareness – Do more to make students aware of the diverse career opportunities in manufacturing

Skills Training – Make sure everyone has strong basic skills, then provide targeted technical training aligned with the needs of area manufacturers

Work Ethic – Reinforce responsibility and a positive attitude as part of the educational experience

Partnerships – Continue to build partnerships with companies to stay abreast of skill needs and find ways to get more students involved in work-based learning

PRIMARY AREAS OF SKILL DEFICIENCIES IN JOB APPLICANTS:

Technical Skills – assembly, blue print reading, CNC operators, design, machine setup, mechanical aptitude, press operators, RF engineering, welding, etc.

"Workplace Basics" – problem solving, decision making, communication, presentation skills, project management, quality, teamwork, etc.

Workplace Ethics – reliability, attitude, willingness to learn, attention to quality

Basic Skills – computer skills, shop math, following directions, English, etc.

INVENTORY OF MANUFACTURING-RELATED PROGRAMS

To gauge the capacity of the supply-side system, an inventory of manufacturing-related programs offered by various education and training institutions was conducted. In keeping with the goals of AIM-KC and the Dream It. Do It. campaign, manufacturing was defined to include broad-based business functions that occur within a manufacturing environment. The only major function not included in the analysis was information technology. This was due to the large number of programs and the variations within manufacturing establishments.

The inventory focused on:

- Secondary programs offered by area career/technical centers
- Post-secondary, public and private two-year institutions
- Post-secondary, public and private four-year institutions

Note: The complete inventory of manufacturing-related programs can be obtained from AIM-KC.

Summary of Findings - Secondary

Nine career/technical centers offer 27 programs in eight different occupational areas: business computer technology, drafting/CAD, electronics, industrial mechanics, industrial maintenance, marketing/management, machine technology, and welding/metal fabrication.

The following general observations are based on the results of the inventory and interviews with selected individuals in the Kansas City area who are familiar with secondary education programs:

- ***Career/industrial technology education has declined.*** While Career Centers offer many excellent programs, interest in and support for career/industrial technology education in general has declined in the Kansas City region in recent years, particularly in the urban core. Numerous reasons are cited, including:

- Students do not see the value of technical training
- Most parents want their children to go to college
- It is difficult to find and retain qualified teachers
- Maintaining state-of-the-art labs is expensive
- Districts are emphasizing reading and math; career education is not viewed as supporting achievement

- ***Few "manufacturing-related" programs exist***. Even when broadly defining manufacturing-related functions to include business, computer technology and marketing/management, the number of programs is low, particularly in skill areas with growing demand, such as machine technology and industrial maintenance. Pre-engineering programs are not part of the regular instructional programs at most high schools.

- ***Students lack information about career opportunities in manufacturing***. In most instances, instruction in manufacturing-related areas is being provided through specific occupation-focused courses, which are often taken more as electives than as part of a comprehensive career pathway plan of study. With few exceptions, school districts in the Kansas City region have not created "career clusters" in manufacturing or industrial/engineering technology, resulting in a fundamental lack of information (and often misperceptions) about career opportunities in manufacturing.

• ***Linkages with community colleges are strong***. While the number of manufacturing-related programs is relatively low, linkages with community colleges are strong in several ways. Many school districts and community colleges have signed "Tech Prep" agreements. These agreements allow high-school students in many programs to exercise a "dual enrollment" option, simultaneously enrolling in career programs in both their high school and a community college. School districts and community colleges in various regions also have formed consortia to support coordinated program planning and increase articulation.

Promising New Directions

Several new developments have occurred in the Kansas City area in recent years that hold promise of new direction for secondary manufacturing-related program activity.

• **The Summit Technology Academy (STA)**, part of the R-7 School District, provides a multiple exit program that prepares students for entry into high-tech, high-wage careers immediately upon graduation, or entry into associate-degree or bachelor-degree programs in technology or engineering. Rigorous coursework includes instruction in engineering and electronics. The STA is a cooperative project of the Lee's Summit R-7 School District, the Blue Springs R-4 School District, Central Missouri State University, Metropolitan Community Colleges, FabTech Inc., Townsend Capital, the city of Lee's Summit, and many other business and school districts. For more information, go to http://sta.leesummit.k12.mo.us.

• **Project Lead The Way:** Several school systems are exploring adoption of Project Lead the Way (PLTW), a four-year sequence of pre-engineering courses. When combined with advanced math and science courses in high school, PLTW exposes students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. Introduction at this level helps build critical math and science skills, attract more students to engineering, and allows students, while still in high school, to determine if engineering is the career they desire. Students participating in PLTW courses are better prepared for college engineering programs – reducing the attrition rate in these college programs, which currently exceeds 50 percent nationally. See www.pltw.org/overview.shtml.

• **Career Clusters:** A number of school districts and community colleges within the Kansas City region are organizing curricula and instruction around key "career clusters" or "pathways." While slight variations exist among regions, career clusters of relevance generally include: (1) business, management and administration; (2) marketing, sales and service; (3) manufacturing; (4) science, technology, engineering and mathematics; and (5) transportation, distribution and logistics. Several districts also are restructuring large schools into Smaller Learning Communities (SLCs) or academies, creating core groups of teachers and students organized around interest or career areas. While no manufacturing career clusters (per se) have been implemented in the Kansas City region, interest appears to be growing.

Summary of Findings - Post-Secondary (Two Year)

Nine post-secondary two-year institutions offer 36 programs in 15 different occupational areas. Based on the results of the inventory completed, and numerous interviews with individuals in the Kansas City area familiar with two-year post-secondary programs, the following general observations are offered:

• **The breadth of manufacturing-related programs is strong**. Generally all major work functions within a manufacturing environment are covered in the mix of programs offered by the two-year, post-secondary institutions. They address a broad range of areas, including production, production planning and design, business management, sales and marketing, etc.

• **The depth of program offerings appears weak in some areas**. Perhaps the most striking areas of potential development include pre-engineering/ engineering and manufacturing technology (i.e., machining), with only two schools offering each of these programs. Each of these areas was ranked high in current and future demand by area manufacturers, but few programs are offered. Only one formal program is offered in both environmental health and safety, and logistics management. Similarly, programs in entrepreneurship and sales/marketing are offered by only a few schools, although some of the content is covered in other related business administration and business management courses.

• **Many degree and instructional options exist for students**. All schools offer a variety of degree options, including certificate programs and degree programs. Most schools offer technology-based, online courses for certain programs, and many have creative "packaging" options (e.g., having students take only one course per month to focus attention on a particular area).

• **Articulation with four-year institutions is operational**. Most schools have existing articulation agreements with area universities, so students can negotiate a smooth transition (if interested) in an upper-level degree program, particularly in pre-engineering and areas that might feed into an engineering program, such as electronics.

• **Linkages with industry-based certifications are inconsistent across schools and across programs**. A few schools have made a significant effort to cross-walk their instructional programs to the requirements of industry-based certifications, but many have either not taken this step or have only focused on certain instructional areas. Industry-based certifications are gaining strength in the marketplace as a validation of skills learned. As a result, more employers are putting a value on them in combination with other earned degrees.

• **Little evidence exists that "workplace basic" skills (i.e., problem solving, team building, etc.) are imbedded in the curriculum of most programs**. Except for the private, for-profit schools, which clearly outline the workplace skills reinforced as part of the instructional process, content related to SCAN-type skills* was generally missing from material describing programs of study at the public institutions.

*The Secretary's Commission on Achieving Necessary Skills (SCANS) was appointed by the Secretary of Labor to determine the skills young people need to succeed in work. The commission's primary purpose is to encourage high-performance.

Summary of Findings- Post Secondary (Four Year)

Ten post-secondary four-year institutions offer over 45 programs in more than 20 different occupational areas. Based on the results of the inventory completed, and numerous interviews with individuals in the Kansas City area familiar with four-year post-secondary programs, the following general observations are offered:

- Both the range and depth of manufacturing-specific four-year programs is weak. Central Missouri State University appears to be the only institution offering a range of degree programs tailored to the needs of area manufacturers, and enrollment levels in those programs with "manufacturing" in the title reportedly is down.

- Several unique programs exist. Missouri Western State University offers northwestern Missouri's only manufacturing engineering program, a two-year program leading to an Associate of Applied Science Degree. The program also is offered as part of a "two-plus-two" bachelor degree in partnership with several areas universities. William Jewell College offers a "three-two" dual degree in engineering with Washington University in St. Louis in which students can earn either a B.A. or B.S. degree in engineering.

- Numerous institutions offer general business programs. Many institutions in the Kansas City area offer programs in support of general business administration, management, and marketing. One has developed a unique, customized program in manufacturing management. Another institution offers a technical management program designed to develop supervisory and management skills needed to effectively lead and support others in technical specialty areas.

- Four area institutions offer traditional engineering programs. Kansas State University, the University of Kansas, the University of Missouri-Kansas City, and the University of Missouri-Rolla all offer comprehensive programs with traditional engineering curricula. Graduates can enter a wide variety of occupational fields, many of which might be related to manufacturing.

Manufacturing-Related Programs (Two- and Four-Year Combined)

- **Accounting (many)**
- **Business Administration (many)**
- **Business Management (many)**
- **Drafting/CAD (4)**
- **Electrical Technology (3)**
- **Electronics Technology (4)**
- **Electronic & Computer Tech (1)**
- **Electronic Engineering Tech (3)**
- **Engineering (many)**
- **Engineering Technology (1)**
- **Entrepreneurship (1)**
- **Environmental Health/Safety (1)**
- **Industrial Maintenance (3)**
- **Industrial Technology (1)**
- **Logistics Management (1)**
- **Manuf. Engineering Tech (1)**
- **Manufacturing Management (1)**
- **Manufacturing Technology (2)**
- **Marketing (many)**
- **Millwright Technology (1)**
- **Pre-Engineering (4)**
- **Technical Management (1)**
- **Welding/Metal Fabrication (2)**

THE GAPS

To complete the gap analysis, findings from the demand-side (manufacturers survey) were mapped against the supply-side (inventory of manufacturing-related programs offered by regional education and training providers). Six primary gaps were identified, and are listed below – not in any particular priority order. A brief analysis of the issues related to each gap is offered, followed by several key recommendations that are being considered by AIM-KC.

Gap No. 1: Secondary/high school programs do not support career pathways into manufacturing (i.e., science, math, pre-engineering, technical skills, etc.) and partnerships with manufacturers appear weak. Manufacturers were asked to respond to the question, what is the single most important thing that the education and training system could do to help companies sustain and grow their business? The vast majority of their responses dealt with improving the image of manufacturing among young people, infusing rigor and relevance into public school education, and helping both students and teachers better understand expectations in the workplace.

The majority of companies indicate they would be willing to serve as a worksite for interns or cooperative education students, implying they were not already involved in such partnerships. Many employers feel that high-school students were not aware of career opportunities in manufacturing. They also believe schools are pushing most students into college, as opposed to ensuring all students have the skills for both work and college. Employers stressed the need for secondary schools to build strong basic skills, foundation technical skills, and sound work ethic.

The inventory of secondary manufacturing-related programs reflects a general decline in career/technical education in the Kansas City area over the past decade. Area districts – much like their counterparts nationwide – have increased their focus on improved academic achievement in reading and math. Unfortunately, this has resulted in a decreased emphasis on career preparation.

At the same time, there is increasing data on the relationship between applied learning and improved achievement. As a result, more school districts are adopting new models of Smaller Learning Communities (SLCs) within high schools. SLCs are often formed around career themes as a means of engaging students in the learning process. Curricula is developed in cooperation with industry leaders to ensure students graduate with the foundation skills employers need, as well as courses required to enter college.

Recommendations

- Support adoption of Project Lead the Way to enhance math and science courses at both the middle- and high-school levels.

- Establish more Smaller Learning Communities in area high schools, such as those enjoying success under the renowned First Things First model in Kansas City, Kansas, including SLCs focused on manufacturing, technology and engineering. *Note: Smaller, more personal learning environments help instill the type of work-ethic-related behaviors employers want.*

- Encourage existing area Career Centers to model programs based on the successful Summit Technology Academy approach, which provides rigorous programs of study – not just elective courses. The academy is fully integrated in an industrial setting and is responsive to area employers.

• Implement more school-business partnerships with manufacturers, including review of curriculum, sponsorship of internships, plant tours, service on advisory boards, etc.

• Conduct awareness training for teachers, guidance counselors and parents on the world of modern manufacturing, including field trips, externships, information on career opportunities, etc. Consider such proven models as summer institutes, immersion programs, plant tours, awareness breakfasts, etc.

Gap No. 2: Current education and training programs are not putting enough emphasis on workplace basics (i.e., problem solving, decision making, team building, communication, etc.).
A common theme expressed by manufacturers was the need to build such workplace skills as team building, communication, decision making and problem solving. The issue was among the top two concerns regarding skill deficiencies for both new hires and current workers.

Findings from the inventory of manufacturing-related programs suggest that while such topics are likely addressed in many programs, there needs to be more emphasis placed on them as part of the instructional process. These types of skills can be taught, but are best learned by integrating them with specific subject matter – as opposed to being taught in isolation. In addition, these "process" skills should be practiced over time, beginning in elementary and middle school, and reinforced throughout secondary and post-secondary education.

Several private, post-secondary schools have very structured workplace skills curricula imbedded in all course outlines. Topics include: team dynamics, creative problem solving, communication skills, customer service, business presentations, etc.

There is no evidence that public secondary and post-secondary institutions emphasize the importance of these workplace basic skills, even though – by their own admission – they have been aware of the SCANS report for the past decade and have been hearing repeated requests from employers.

Recommendations:

• Reevaluate the importance of workplace basics skills in instructional programs at all levels. Most institutions interviewed for this report believe they are teaching students skills in problem solving, decision making, etc.; and they probably are. The issue, therefore, is one of emphasis and continued reinforcement throughout the educational continuum.

• Conduct audits of existing programs at both the secondary and post-secondary levels, prioritizing those highlighted in the inventory of manufacturing-related programs conducted for this report. Infuse more instruction and activities related to building workplace skills to fill the needs identified in the audit.

• Identify, share and adopt best practice programs and curricula for effectively teaching workplace basic or SCAN-type skills at different instructional levels. Numerous professionally developed programs offer both curriculum and instructional practices for teaching workplace skills, as well as assessment tools for evaluating student progress in mastering such skills.

• Consider the adoption of an employability certificate program. Several workforce investment boards and community colleges across the country have implemented employability certificate programs in partnership with their area employers and education and training providers. Such a certification could be offered at different levels by different institutions, and they would essentially validate to employers that individuals could demonstrate critical workplace basic skills.

Gap No. 3: The region lacks a short-term training program in manufacturing "foundation" skills to quickly move new employees into production jobs.

The vast majority of manufacturers responding to the survey report that more than half of their workforce is involved in plant operation/production. All other major functions engage much smaller percentages of the total workforce. In addition, plant operation/production emerged as one of the top trouble spots in terms of difficulty in finding and hiring qualified workers, with about 70 percent of manufacturers expecting to have "severe and moderate difficulty" filling vacancies over the next two years.

Small- and mid-sized manufacturers need entry-level workers who have a broad set of "foundation" skills in manufacturing and are able to perform multiple tasks in the constantly changing manufacturing workplace. While specific occupational programs are offered by all levels of institutions, most are a semester, a year, or two years in length. The region does not have a short-term, skills-based training program that teaches manufacturing-related skills.

More than 100 employers responded to a question about the need for a short-term training program to teach foundation skills to entry-level workers, and support was very strong. Consistent with other responses, employers would want such a program to have a strong emphasis on workplace skills such as problem solving, decision making, and teamwork. Applied math, blueprint reading, basic mechanics, and precision measurement also were stressed (which were the same skill deficiencies employers listed in their new hires).

Such a program is viewed as a cost reduction to employers, who often spend valuable time and resources teaching these manufacturing fundamentals once someone is hired on the job.

Recommendations:

- Convene a task force of education and training providers, area workforce investment board staff, and manufacturers to:
  - Study the responses of the manufacturers regarding skill requirements for a short-term program
  - Gather additional input from area manufacturers (if needed), through focus groups or interviews
  - Design a short-term model that meets employer needs, building on successful best practices already operational across the country
  - Cooperatively identify sources of funding to support the program and the most qualified provider(s)
  - Identify area employers interested in hiring program graduates
  - Run a pilot program and modify the program (as needed) based on results
- Build linkages for graduates of the short-term training program with other area institutions to ensure continual skill building after job placement.
- Ensure improvement of the program model over time by evaluating the program's effectiveness on a regular basis.

Gap No. 4: Post-secondary programs may not be geared up to address expected hiring needs in high-demand occupations over the next two years – specifically those in plant operation/production and management, as well as engineering, quality improvement, product development/design, and marketing/sales.

Plant operation/production and management emerged as the top trouble spots in terms of difficulty in finding and hiring qualified workers from the Kansas City area to fill vacancies over the next two years. About 70 percent of manufacturers expect "severe and/or moderate difficulty" in recruiting for these positions. Engineering, quality improvement process, product development/design, and marketing/sales also were identified by approximately half of all firms as areas where they expect to experience challenges in hiring.

The primary reasons for the difficulties in hiring include skill deficiencies in the labor pool, location, image or perception of manufacturing and maintaining competitive wages.

Survey data also suggests that most manufacturers use the newspaper and word-of-mouth to recruit for entry-level workers, and promotion from within and the Internet to recruit for technical/skilled labor and managerial/ professional positions. Few report using the available public workforce system to recruit new workers.

Moreover, the inventory of post-secondary programs at both the two- and four-year levels suggests little depth of program offerings in some of the expected high-need areas. Only two community colleges offer a manufacturing technology program, and only one offers a millwright program. Both programs address the critical machining, equipment setup and operator functions identified by the majority of manufacturers in the survey as the most critical skills gap for new hires.

Similarly, while many schools offer general management programs, only one has developed a manufacturing management curriculum tailored to the specific needs of the industry. In addition, the pre-engineering/engineering pipeline is weak beginning at the secondary level up to the four-year institutions.

Two areas of strength appear to be in design/CAD and marketing/sales, where numerous institutions at all levels offer programs. Articulation agreements also are in place to ensure smooth career pathways.

All of these factors speak to some major disconnects in the current education and training delivery system at all levels – especially as it relates to filling the skill needs of area manufacturers.

Recommendations

- Convene area two- and four-year schools to consider the results of the survey in light of their current program offerings. This effort needs to be a **systems approach**. That is, the schools should do it collectively in order to see the totality of resources available. The group also may identify additional gaps that need to be addressed.

- Analyze the information provided by manufacturers in the survey regarding the most difficult occupations or positions to fill in their companies and the three most important technical skills associated with each position. The results generated expansive tables of occupations and skill sets that may provide great insight into employer needs.

- Map identified skill sets against the actual content of current programs to determine if current curricula address employer needs.

• Conduct additional quantifiable analyses that go beyond the scope of this study. For example, institutions should quantify the number of students enrolled in each of the expected high-demand areas. At the same time, those manufacturers indicating expansion needs should be asked to quantify expected new hires in critical areas. Relevant data from state employment and economic development agencies should be collected and analyzed. Such additional analysis would help quantify the prospective pipeline versus the expected supply, and help guide decision-making processes regarding programs for individual schools and the group.

• Market existing recruitment services more effectively to area manufacturers. In many areas of the country, businesses do not use local government and education resources (e.g., One Stops, Career Placement Centers at colleges, etc.) because they have had bad experiences with them. That does not appear to be the case in Kansas City. The issue seems to be one of a lack of information, which should be a relatively easy problem to fix by involving manufacturers in the discussion of effective communication strategies.

Gap No. 5: Manufacturers need low-cost, customized training programs to upgrade the skills of their current workers in areas of workplace basics, supervision, and technology application. Employers face similar workplace basics issues with incumbent workers as they do with new hires. But the concerns are broader and deeper regarding incumbent workers, because they are already on payroll and are responsible for company production.

Shop floor management and supervisory skills training needs were identified by more than half of the companies as lacking in the current workforce. General upgrading of skills related to production, preventative maintenance, setup processes, and quality assurance also were identified as very important. More strategic issues such as market development, business planning, and engineering also were raised.

Approximately half of the employers surveyed had partnered with local/regional institutions to conduct technical skill and professional-level training. The balance have not for a variety of reasons, but the primary one is a lack of information. In terms of training in workplace basic skills and work ethic-related issues, the majority of companies provided their own training in-house or sent workers to seminars.

It is apparent that a number of valuable customized training programs and business assistance services are offered by most area institutions, but cataloging and assessing them was beyond the scope of this study.

Nonetheless, these findings suggest new opportunities for the colleges and universities in terms of forming partnerships with manufacturers and providing additional needed services – particularly in the areas of workplace basics, "customized" supervision, and technology application in the workplace. Ideally, such training would be fully integrated with the types of business consultation services offered by several institutions in the Kansas City region – linking needed training to identified outputs of companies.

Recommendations

• Convene a task force of schools that currently provide (or are interested in providing) customized training for incumbent workers in manufacturing establishments to review and discuss the results of the gap analysis findings.

• Identify and promote federal or state programs available to assist with training incumbent workers. Cost of training was identified as a barrier, particularly by small- and mid-sized firms. Many may not be aware of resources available in support of customized training for incumbent workers and how to access those funds.

• Utilize consortia models for training on generic workplace skills. Many firms experience similar issues regarding skill deficiencies as they relate to communication skills, customer service, team building, etc. Most do not have the critical mass needed to conduct a customized training program. However, national consortia models exist where groups of firms "cooperate to compete." Focusing on workplace basic skills is an easy way to launch such a training strategy.

• Customize supervisory, technology application training, and other high-demand training to the manufacturing environment. Most institutions offer "off-the-shelf" supervisory skills training, but few customize it by industry segment.

• Market existing training programs and services more effectively to area manufacturers. Involve manufacturers in the discussion of effective communication strategies.

Gap No. 6: Many manufacturers in the Kansas City area are not familiar with and are not utilizing workforce programs and services available from education and training providers. Based on findings from the manufacturers survey, the majority of employers do not use One Stops, high school partnerships, or college and university career centers to recruit new workers. Word-of-mouth and newspapers are the two most popular techniques for recruiting entry-level workers. Promotion from within is used most often for recruiting technical or skilled labor and managerial or professional talent.

More than 60 percent of companies that have provided training in workplace basics (e.g., teamwork, customer service, etc.) to their incumbent workforce did the training themselves; the second choice was professional seminars. In terms of customized training to address skill shortages, about half of the manufacturers surveyed had partnered with a wide variety of local training partners. The primary reason the balance of manufacturers did not was because they were not familiar with their services.

In addition, many area manufacturers are not familiar with and are not using programs and services of local and regional education and training providers for recruitment or for customized training to address generic workplace skill deficiencies and more technical skills. It is likely the same disconnect holds true for other types of resources available to area manufacturers not included in this inventory, such as financing, marketing, and technology application.

Recommendations:

• Establish a task force of both manufacturers and supply-side providers to identify effective strategies for promoting existing programs and services to area manufacturers, with a particular sensitivity to the needs of small manufacturers.

• Create a resource guide for manufacturers (organized by major functional areas) that would outline key workforce programs and services, and other areas if appropriate – providing a brief summary and contact information. Widely distribute the guide – both electronically and through area trade and business organizations.

• Establish and promote AIM-KC as a "single-point-of contact" that all area manufacturers can use as a customer-friendly point of reference for workforce issues. Such a contact also would allow AIM-KC to serve as a broker or in a referral role on behalf of the myriad of education and training providers in the region. In addition, AIM-KC could become a catalyst for creating systemic solutions to common workforce problems.

Conclusion

The Greater Kansas City area is at the forefront of an effort to ensure our nation's competitiveness and to provide our region with a path for economic growth and unprecedented opportunity. The findings of this gap analysis suggest a number of areas in which we can better align the education and training programs in the Kansas City region with the workforce needs of area manufacturers.

Like many cities and regions across the country, numerous "pockets of excellence" exist in the form of programs, institutions, and services geared to supporting the manufacturing sector. What is needed, however, is a **"System of Excellence"** that addresses the planned expansion of many firms and the need for replacement workers over the next two years.

AIM-KC will serve in many roles – a broker, a convener, a catalyst – for managing the short- and long-term changes needed to foster better alignment and bridge the skills gap. Focused, decisive action is required by all stakeholders. Education and training providers must embrace the need to collectively analyze their current capacity relative to the needs of area manufacturers, and be willing to make needed changes to support the growth of this critical economic sector. Manufacturers will need to become more engaged in an ongoing effort to clarify their workplace requirements, and assist in steering the change process.

Finally, our region would be well served if it were to adopt a benchmark process to track critical indicators of progress over time. Using the results from the survey, and other key business development indicators, an annual evaluation of progress should be conducted. Such a "progress report card" will assist both employers and providers in their efforts to make continual improvements to the workforce delivery system in support of manufacturing growth.

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