

CURRENT ISSUES IN HR

CLOSING THE MANUFACTURING SKILLS GAP

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The Skills Gap Defined

Despite high levels of unemployment in the U.S., many employers today, particularly in manufacturing, are struggling to find the talent they need. Manufacturing jobs have grown by 4.3 percent from 2010 to 2013; however, analysts say that overall growth in manufacturing is being held back by a lingering skills gap.

A Shortage of Manufacturing Talent

A 2011 Deloitte survey of 1,123 executives conducted for the National Association of Manufacturers (NAM) reported:

- 600,000 U.S. manufacturing jobs remain unfilled.
- 82 percent of manufacturers report a moderate or serious shortage in skilled production workers.
- 75 percent of manufacturers say the skills shortage has negatively affected their ability to expand.

Estimates vary on the scope of the skills gap, but according to ManpowerGroup's *2012 Talent Shortage Survey*, vacancies for skilled trades workers are the most difficult to fill across the globe. The survey, which included more than 38,000 employers in 41 countries and territories, found that despite the slow-paced economic recovery, approximately one third of employers say they have trouble filling positions due to a lack of available talent.

The Boston Consulting Group (BCG)'s "Made in America" research series estimates the shortage at 80,000 to 100,000 highly skilled manufacturing workers. This research

shows that the most significant manufacturing skills gaps are concentrated in the following five cities: Baton Rouge, La.; Charlotte, N.C.; Miami; San Antonio, Texas; and Wichita, Kan. Occupations in shortest supply are welders, machinists and industrial-machinery mechanics.

A Deloitte/NAM survey estimates the shortage of U.S. manufacturing workers at 600,000. This shortage, in turn, has a rippling effect on individual companies. It reduces productivity and profit, and affects the overall U.S. economy, hindering job creation and gross domestic product. Using analysis by the U.S. Bureau of Economic Analysis, NAM estimates that filling these 600,000 positions would result in 406,441 additional jobs being created, plus an increase in GDP of 1.03 percent.

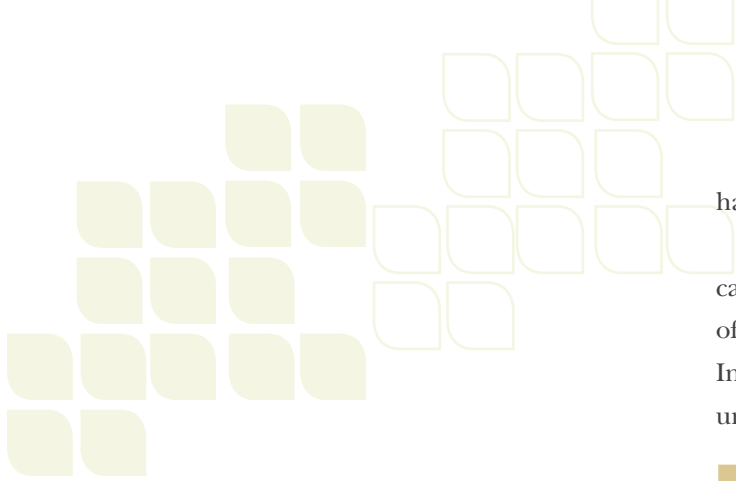
The BCG report warns that if manufacturing continues to expand and the Baby Boomers continue to retire at present rates, the shortage of highly skilled manufacturing workers could grow to approximately 875,000 machinists,

The Aging Manufacturing Workforce

- The median age of the manufacturing workforce rose from 40.5 years in 2000 to 44.1 years in 2011.
- The average age of a high-skilled worker* is 56.

* Workers with technical training and industry certification, or an associate's or bachelor's degree in a manufacturing-related field.

Source: U.S. Department of Labor



welders, industrial-machinery mechanics and industry engineers by 2020. The Society of Manufacturing Engineers predicts that the shortfall of skilled factory workers could increase to 3 million jobs by 2015 due to the aging manufacturing workforce and the resulting retirements of older workers.

Regardless of the exact size of the skills gap, the shortage of manufacturing talent is expected to worsen without public and private sector intervention. To close the gap, organizations must do a better job of partnering with educational institutions and community and government groups to offer training and create a pipeline of workers with skills matched to the industry's needs.

Four Ways to Close the Gap

1. Partner with Community Colleges

Yonnie Leung, senior manager for workforce development at Pacific Gas & Electric (PG&E) Corp. in San Francisco, Calif., is well aware of skills shortages affected by demographic trends. At PG&E, 40 percent of the workforce (about 10,000 workers) is at retirement age or approaching it.

Leung says that employers must work with educational institutions to bridge the skills gap that exists currently and will persist if organizations don't act. "It's up to us as employers to make sure that the people come out of those institutions trained and ready for the manufacturing jobs that are unfilled," she says. "You can't expect your vendors to provide you a product without them knowing what the specs are."

In 2008, PG&E created a training program in connection with community colleges, universities, workforce training boards and other organizations to provide training for entry-level jobs. About 71 percent of graduates from the program find work either at PG&E or in the industry as utility workers, apprentice electricians, gas service representatives, materials

handlers and underground technicians.

PG&E illustrates that community college partnerships can work. However, community colleges are a resource often overlooked by businesses, according to the Aspen Institute. Community colleges make up almost half of all undergraduates who may be open to manufacturing careers—

Benefits of Community College Partnerships

- **Access to students.** Community colleges are well-suited to address the lack of well-trained, skilled and certified workers across the country.
- **Location.** Community colleges are located in all 50 states and the District of Columbia. Regardless of their location, businesses can find a community college partner nearby to help them with their job-training needs.
- **Flexibility.** In many cases, community colleges are more flexible than other educational institutions in changing their class offerings, class times and even class locations to meet the needs of local employers and workforce.
- **Open admissions.** Community colleges generally have open admissions. The overwhelming majority of potential workers are eligible to take classes at community colleges.

Source: *The Aspen Institute*

if they knew about the opportunities and were trained for them.

Providing community college students with the skills they need to meet the needs of employers requires more employer-community college partnerships, states the Aspen Institute.

2. Create an Apprenticeship Program

Despite the fact that many manufacturing jobs require a high school diploma with additional training and certification, only 16 percent of respondent companies recruit in high schools, a June 2012 study by BCG found. About 30 percent of high school graduates don't go on to college, according



to the Bureau of Labor Statistics, leaving them with limited career options. Meanwhile, the college graduation rate in the United States plateaued at 38 percent from 2005 to 2010, according to the report *A Stronger Nation through Higher Education*, released by the Lumina Foundation in 2012.

These young people foregoing four-year college degrees present a potential and trainable labor pool for manufacturers. Apprenticeship programs, more robust in European countries, are one way to train that workforce. But only 0.3 percent of the U.S. workforce is classified as apprentices, according to a 2010 report by the Urban Institute in Washington, D.C.

Apprenticeship2000 in Charlotte, N.C., is one of the few. Created in 1995, the four-year technical training apprenticeship program is available to high school juniors, seniors and graduates. They train at one of the eight area partnership firms to earn mechatronic technology degrees and apprenticeship certifications. On days when the apprentices aren't on the job, they study a curriculum designed by partnering companies at the Central Piedmont Community College in Charlotte. The training costs, shared among the participating organizations, total about \$160,000 per student. Students who complete the program are guaranteed a job earning at least \$34,000 a year as tool and die makers, technicians, welders or machinists.

3. Work with a Nonprofit Coalition

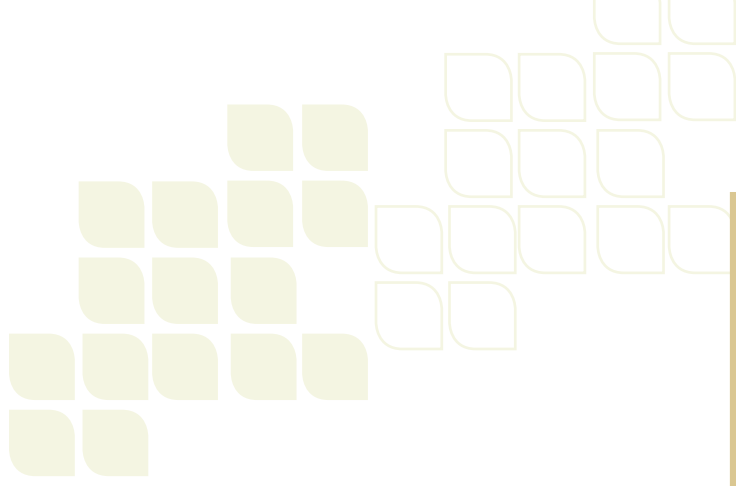
Local government partnerships can help connect manufacturers to training resources. For example, the California Manufacturing Technology Consulting (CMTC) is a coalition of southern California industry associations, community colleges, economic development agencies and workforce investment boards. The coalition is part of the U.S. Department of Commerce Hollings Manufacturing Extension Partnership (MEP) Program. In 2012, the CMTC served 741 manufacturers by identifying areas of

Manufacturers Train Military Veterans

In October 2012, the Manufacturing Institute launched a coalition with manufacturers, including General Electric, Boeing and Lockheed Martin, that aims to train military veterans for jobs in advanced manufacturing. The Get Skills to Work coalition will focus on accelerating skills training for U.S. veterans, helping veterans and employers translate military skills to in-demand advanced manufacturing positions, and empowering employers with tools to recruit, onboard and mentor veterans.

Partnering with community and technical colleges in 10 U.S. cities in 2013, the coalition has a goal to help 15,000 veterans translate military experience to corresponding advanced manufacturing opportunities and gain the technical skills needed to qualify for careers in this growing sector. With more corporate partnerships, the coalition says it can train 100,000 veterans by 2015.

“Based on our experience recruiting and training veterans to work at Boeing, we believe the Get Skills to Work initiative could have a major impact on the hiring of veterans nationwide,” says Rick Stephens, senior vice president of human resources and administration at Boeing, and a U.S. Marine Corps veteran. “Using many of the same tactics and tools, we have hired and trained nearly 3,000 veterans in the past 21 months for jobs at Boeing. It’s a proven approach for matching the skills of those who have served our country to the hiring needs of American businesses.”



improvement in capability, process and systems to create financial impact.

Santa Ana, Calif.-based Johnson Precision Products sought the help of CMTC in January 2010. Over the next 18 months, Johnson Precision Products and CMTC conducted a Blue Print Reading, CNC training, Lean Process Training and a class on problem solving. As a result of CMTC's programs, the company reported strategic restructuring changes within its system, drastically increasing its workflow and overcoming production delays. Johnson Precision Products was able to realize \$20,000 in cost savings. Improved processes led to increased customer satisfaction, retention of \$150,000 in sales, two new employees and the creation of a new position.

To find an MEP program near you, visit <http://www.nist.gov/mep/>

4. *Make Credentials Portable*

Certification is becoming an effective way to gauge workers' skills and to make them more portable among different jobs. The Manufacturing Institute launched the NAM-endorsed Manufacturing Skills Certification System, which provides a series of portable, industry-recognized credentials based specifically on employer-identified skills. These credentials, and the training required to obtain them, certify that an individual possesses the basic skills necessary for a career in manufacturing and ensures that they are useful nationwide and across multiple manufacturing sectors. The system also can be used to upgrade and hone the skills of current employees to meet the changing demands of new technologies, processes or job descriptions. Skills certifications reduce the risk in hiring and promotion and can save employers time and money, according to the Institute.

Bison Gear & Engineering Offers Online Training

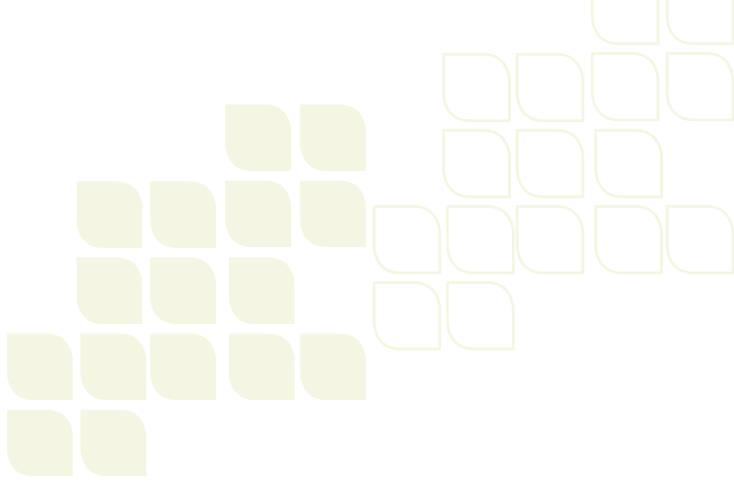
St. Charles, Ill.-based Bison Gear & Engineering has a goal of employing a 100-percent certified workforce. The industrial/commercial power transmission and motor control manufacturer with about 250 employees relies on its LEAN manufacturing system. Hiring and retaining workers with the required skills, from production workers to engineers, is an ongoing challenge for the manufacturer. In 2008, Bison began offering current workers the opportunity to improve knowledge through an online curriculum to earn one of the certifications—the Certified Production Technician (CPT).

- Four critical areas are covered: safety; quality practices and measurement; manufacturing processes and production; and maintenance awareness.
- Workers are rewarded with \$100 for each of four modules they pass and an additional \$100 if they pass all four and earn their CPT.
- Workers typically spend 16 to 18 hours of self-study to complete each module.
- Since the focus on certification, Bison's productivity has improved by 31 percent. The 2011 quality level set a new standard in the history of the manufacturer. Bison credits the certification with fewer accidents, increased quality improvements, and a more self-directed, confident and engaged workforce.

Conclusion

Many partnerships and programs are being launched to solve local skills gaps, but there is more that companies can do:

- Reach out to high school students. Most high-skilled jobs require only a high school education in conjunction with on-the-job training.



- Increase visibility at the high school level to create awareness and improve the image of manufacturing—a major problem cited in the recruitment of talent.
- Expand on the strong programs and best practices that exist to develop skilled employees.
- Link community colleges more closely to the needs of manufacturers.

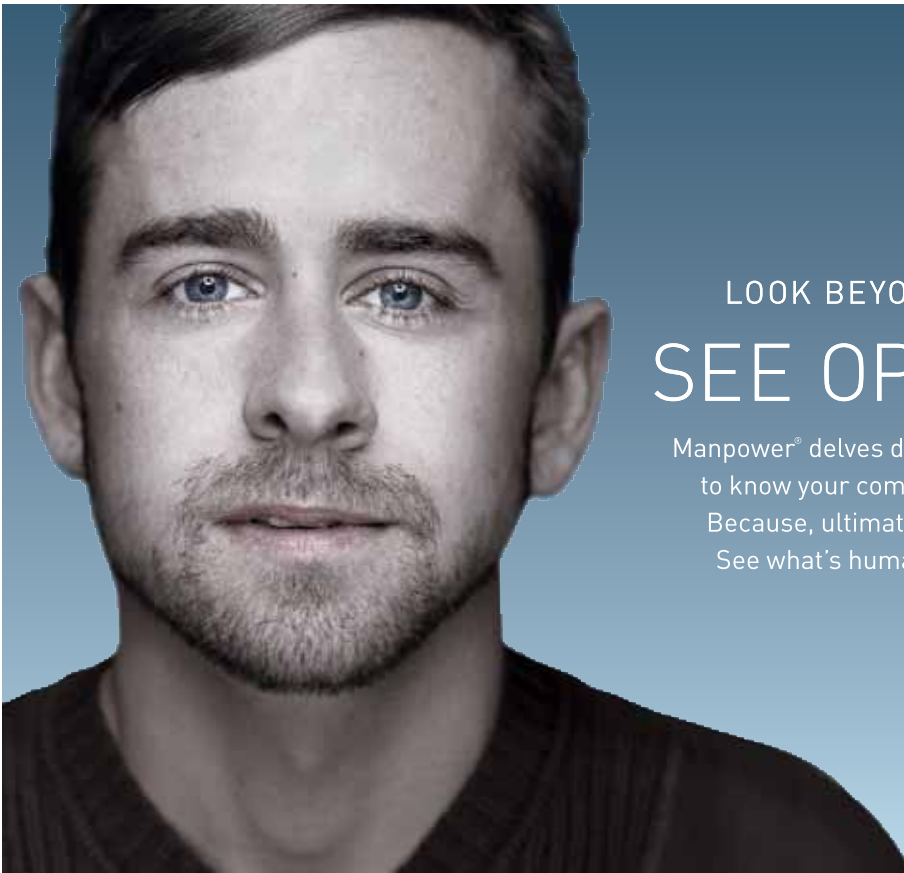
In addition, manufacturing companies should:

- Use demographic risk management and workforce planning tools to anticipate issues and enlarge the pool of potential candidates.
- Reinvest in internal training programs to build required capabilities.
- Anticipate future needs and begin to match younger talent with experienced employees in an apprenticeship model.
- Collaborate with education partners and governments to build programs that focus on developing specific skills.

In summary, though manufacturing may currently be challenged with finding the right talent, there are steps that can be taken to improve the situation. The links below are a good starting point for taking action.

Additional Resources

- Apprenticeship 2000 <http://apprenticeship2000.com/index.html>
- The Aspen Institute www.aspeninstitute.org
- Boston Consulting Group, *Made in America*..... www.bcg.com/expertise_impact/publications/publicationdetails.aspx?id=tcn:12-84591
- California Manufacturing Technology Consulting www.cmtc.com
- Expanding Apprenticeship*, Urban Institute Report www.urban.org/UploadedPDF/901384-Expanding-Apprenticeship.pdf
- Get Skills to Work www.getskillstowork.org
- Manpower's *The Future of the Manufacturing Workforce*... . www.manpower.us/en/Employers/Industry-Focus/Manufacturing.htm
- ManpowerGroup *Annual Global Talent Shortage Survey*: www.manpowergroup.com/research/research.cfm?chooseyear=2012&categoryid=2
- Manufacturing Extension Partnership www.nist.gov/mep
- The Manufacturing Institute www.themanufacturinginstitute.org



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