



A Hawkeye Community College tool and die student grinds a leader pin for his die set. The college uses equipment like this Supertec cylindrical grinder, along with CNC mills, lathes, EDMs and manual machines to train students.

Hawkeye Community College

Youth must be served

Promoting manufacturing careers and educating young workers goes hand-in-hand.

By Bill Kennedy, Contributing Editor

When it comes to job prospects for CNC machinists and programmers, fewer doesn't necessarily mean worse. The U.S. Department of Labor's Bureau of Labor Statistics says increased productivity and foreign competition will reduce total U.S. employment of CNC machinists and programmers by 3 percent over the next 10 years. However, the bureau also says job prospects for those positions will be good to excellent, due to the limited number of candidates to replace experienced workers who retire or move to other occupations.


In other words, while the total number of jobs will decline, the number of workers available to fill them is expected to sink even more.

In this age of virtual reality and the service economy, manufacturing careers have a negative image, especially among American youth. However, some manufacturers and educators are fighting back with training programs and outreach efforts that highlight the clean, high-tech nature of today's manufacturing work, its potentially high wages and manufacturing as a still promising career for young people. These programs not only target students, they focus on parents whose attitudes can shape their children's attitudes toward technical education.

The M Word

"The word 'manufacturing' is a hard

Learn more about training

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sell ... and so is 'job training,' " said Tony Girifalco, executive vice president, Delaware Valley Industrial Resource Center (DVIRC), Philadelphia. Four years ago, DVIRC began to work with Delaware County Community College to develop a manufacturing education

program. "We called it Manufacturing Technology," Girifalco said, "and we had to drag people to it. Then we renamed it Applied Engineering Technology [AET], and now we are getting interest and enrollment." A key influence in the "stigma" connected to manufacturing, he said, is "parents who want their children to get college degrees, which is a good thing, but these kids actually want to do stuff with their

hands. They are smart kids, but are tired of sitting at a desk all day in front of a blackboard. For them, college is not a good fit. You wind up doing a disservice to the kids."

To counter the objections, DVIRC ties its programs to higher education. It has worked with local academic institutions to create a "tech/prep" training path in which the curriculum progresses from junior and senior in high



DTMA

school to a possible bachelor's degree. High school students can earn college credits accepted either directly at 4-year institutions or toward an associate's degree at community colleges. Credits in the associate's degree, in turn, are applicable toward a bachelor's degree.

The AET programs offer associate's degrees in machine tool automation (CNC), process control and industrial systems (maintenance/mechatronics). "We create options for students," Girifalco said. "We keep the bar high; you have to have solid math and science and be able to communicate and read well to get into these programs."

Girifalco said technical education in the Delaware Valley region has diminished markedly over the past 20 years, leaving only a handful of machining programs at the high school level. "It's too hard to get enrollment and invest in new equipment," he said. "We are having some success with getting some of the remaining programs tied into the AET track."

The educational initiatives are part of DVIRC's economic development activities. DVIRC is one of six Pennsylvania industrial resource centers in the National Institute of Standards and Technology's Manufacturing Extension

In fall 2007, more than 50 teams from Dayton-area schools faced off at a regional Bots IQ competition. Students sponsored by local manufacturers designed and built remote-control robots to do battle with robots from other schools. The Dayton Tooling & Manufacturing Association runs the program.

Partnership that provides consulting for small and medium-size manufacturers. Education, particularly that focused on STEM (science, technology, engineering and math) programs, is a key economic development activity, Girifalco said, "because companies will go to and grow where the trained people are."

Robots and Retraining

Angelia Erbaugh, executive director of the Dayton Tooling & Manufacturing Association (DTMA), agrees that "manufacturing is not seen as a 'career of choice' for young workers, partly because parents believe that manufacturing is dying and does not offer long-term career options and partly because U.S. public education promotes 4-year college degrees over other forms of education."

DTMA reaches out to elementary, middle school and junior high school students through career awareness ac-

tivities, such as its Bots IQ program. In that effort, local manufacturers sponsor students who design and build remote-control robots to do battle with robots from other schools. The program exposes students to all facets of manufacturing and hopes to increase their interest in manufacturing careers. In the fall of 2007, more than 50 teams from Dayton, Ohio-area schools faced off at a regional Bots IQ competition. DTMA

will expand the program this year, with competitions in both the spring and fall at high-traffic locations, such as shopping malls, where both young people and their parents congregate.

DTMA's workforce development efforts are not limited to courting youth. In cooperation with DTMA, Dayton's Sinclair Community College offers a 1-year CAM STEP II certificate training program. Program graduates who wish

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DTMA has worked with Sinclair on STEP II for more than 20 years to ensure the curriculum is relevant. Most recently, DTMA helped Sinclair develop a co-op track for the program intended to increase enrollment. Students can combine work in the industry with their

college studies, providing them with experience, wages and college credit.

For experienced workers, DTMA partners with Sinclair on the Top Gun Tooling and Machining Academy to improve machinists' skills and develop top performers. Another DTMA effort is a retraining program for displaced, unemployed and underemployed workers in the Dayton area. DTMA also works with the National Tooling and

Machining Association (NTMA) on "Precision Jobs for American Manufacturing," which targets military veterans for training in manufacturing.

Powerful Programs

Cooperation between educational institutions and manufacturers can produce powerful results, with the former enrolling students and the latter getting access to trained graduates. Paul Osborn, Ed.D., dean of applied science and technology at Hawkeye Commu-

cludes about 25 local manufacturers. "They have the expertise to tell us what works and what doesn't," said Osborn. "From the get-go, the intention was to have a CNC tool and die program designed to meet the needs of industry. We have graduates who know how to program, set up and run CNC operations." In addition to academic guidance, the advisory board supports the school financially. "We have a multimillion-dollar shop," Osborn said, "Most schools don't have the kind of equipment we have."

Lyle Michels, president of Hawkeye Tool and Die Inc., Jesup, Iowa, is on the advisory board. His company produces prototypes and one-off repair parts as well as custom fixtures. "We target the food processing industry but serve whoever wants things done," he said.

"If manufacturers want the community colleges to supply certain kinds of training, they should participate," he continued. "Community colleges are an extension of the local school system, and every student is not going to [a 4-year]

SGS Tool's employee recruitment program includes a DVD created to reach a number of generations, with junior and senior high school students its first audience. For those students, the DVD cover features a superhero. A tabletop display, brochure and posters also follow the superhero theme.

college. Some of them can't afford to and some of them aren't interested. You need some kind of training after high school, and the community college fills that gap." Michels said the Hawkeye Commu-

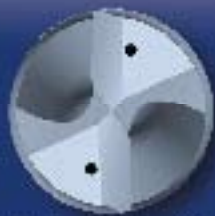
In this age of virtual reality and the service economy, manufacturing careers have a negative image, especially among American youth. However, some manufacturers and educators are fighting back with training programs and outreach efforts that highlight the clean, high-tech nature of today's manufacturing work.

nity College, Waterloo, Iowa, said the institution's CNC machining/tool and die programs "have the luxury of being close to full capacity. Every student we graduate is hired immediately. If we doubled the size of the program, we still wouldn't fill industry needs. But we need to grow it and are out looking for dollars from the federal government and anywhere else to add faculty and staff so we can recruit more students."

The Hawkeye training programs evolved from a relationship with Deere & Co., Moline, Ill., the region's largest employer. The agricultural equipment maker sponsors a 2-year scholarship at the school, after which students go to work for Deere.

The college's training curriculum is guided by an advisory board that in-

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nity College program is “excellent,” noting that “through a program the advisory board established there, I’m currently employing five students part-time.” The students run machines to produce parts and deburr, heat treat, set up and inspect under supervision.

Manufacturers must team up with schools to encourage students to consider vocational training. “I’m talking all trades,” said Michels. “We have a shortage of electricians, welders and truck drivers. I’d like to see some kind of video program that can be shown to high school students.”

Video Initiative

SGS Tool Co., Munroe Falls, Ohio, has done just that. For its own recruiting efforts, the solid-carbide rotary cutting tool manufacturer’s human resources and marketing staff created a video that presents the attractive aspects of a career in manufacturing in general, while promoting the benefits of making that career at SGS. (To see the video, go to www.ctemag.com and click on Interactive Reports).

SGS President Tom Haag said parents generally have a negative image of manufacturing careers, recalling the dull, dirty and dangerous working environments of their fathers or grandfathers. “We spend a lot of time, energy and money making our manufacturing plants clean, and now we have to send that message to people who still have a negative perception,” he said.

Jackie Schulte, director of human resources for SGS, said a company survey of local eighth and ninth graders confirmed that students’ perceptions of manufacturing mirrored those of their parents. SGS realized it needed to make a positive impression on those youngsters. “We wanted to get our name out there as they move through the school system,” she said.

Schulte said the video’s intended audience spans generations, but junior and senior high school students are its main audience. “You have the millennials coming in and the baby boomers moving out of the market. We needed a message that helps us bridge that gap.” The video has a cover featuring a superhero, “a diversified superman so he reaches different nationalities, allowing SGS to convey a local and global presence,” Schulte said. A tabletop display, brochure and posters also follow the superhero theme.

The video’s second audience is “someone who is more seasoned in the industry,” Schulte said. So, after an opening sequence in which a high school student tells his father about the excitement and challenges of work in a modern manufacturing environment, the video introduces SGS employees who joined the company from elsewhere in industry or who rose through the ranks at SGS.

The video gets national and international exposure through Canton, Ohio-based CareerMarketplace, a profession-specific Internet employment network. The site features clips of the video that make job seekers aware of opportunities at SGS. The clips also raise awareness about SGS high-performance tooling products among purchasing agents and others involved in choosing cutting tools.

Schulte said upfront investment in recruiting provides a worthwhile return. The efforts generate sufficient inquiries

to create an applicant pool that enables SGS to be selective in its hiring process. “We received over 1,000 applications and resumes for 22 positions [in 2007],” said Schulte.

With its dual focus on recruitment and career advancement, Haag said the video is “the invitation to an education.” SGS mandates every employee receive 50 hours of training yearly, including cross training to cover other employees’ jobs, attending seminars or conferences and listening to business audio tapes. The company provides off-site CNC training sessions and Web-based e-learning via Tooling University (toolingu.com).

SGS also sponsors employees in a journeyman toolmaker’s certification program at Stark State College of Technology, North Canton, Ohio. Completion of the 1-year program puts an employee more than halfway towards an associate’s degree in industrial technology. “We pay for all the journeyman toolmaker’s education. Then if they or anybody else



Daman Products

At manifold-maker Daman Products Co. Inc., employees take responsibility for their own education by seeking out the resources and people needed to reach a specific training goal. Here, a shop-floor mentor discusses a process with a machine operator.

within the company decides to pursue a degree beyond that, we reimburse them \$4,000 a year for 4 years to go to college,” Haag said.

Haag added that SGS and its associated companies employ about 375 people. Annual turnover is low—about 8 percent. “But that still represents 30 positions you’ve got to fill every year,” he said.

The SGS video came to the attention of the NTMA, which asked Haag to address a meeting in February 2008 about the employment situation and tactics to handle it. Haag agreed, calling the manufacturing recruiting issue “a national problem.”

Getting and Keeping

Promoting a better image for manufacturing jobs helps create awareness, but companies with worker-friendly, teamwork-based environments can add another incentive for recruiting and retaining employees. And one such company—Daman Products Co., Mishawaka, Ind.—has found that the best people to recruit for manufacturing jobs may come from outside the manufacturing industry. Asked about the difficulty



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An advisory board of local manufacturers helps fund the Hawkeye Community College machining program and recommends equipment for it to purchase.

of finding people who want to work at Daman Products, President Larry Davis said, "We're not finding it hard at all."

Daman designs and manufactures hydraulic valve manifolds for machine tools, mining, offroad and construction equipment and other applications. "The way we operate is for people to be responsible for themselves," said Davis. "Shop floor activity is managed by those on the shop floor. No supervisors dictate what to do, when to do it or what material and tooling to use." The result, he said, is a culture of continuous improvement based on responsibility, accountability and helping the customer.

Finding new employees is not hard, Davis said, because "The majority of

said. "If that means you need to shuffle things around to meet their needs, that's what you do. And those things are critical to the way we operate."

Having a manufacturing background does not disqualify an applicant, but is at best a neutral factor. That's because a few years ago, Daman discovered that 34 percent of its employees left the company, voluntarily or involuntarily, before completing 2 years of employment.

After analyzing the problem, Daman found that the short-time employees who left the company had the most manufacturing experience and highest mechanical aptitude.

Shoulders said new employees with long careers in traditional manufacturing can find the Daman environment difficult. "We expect them to do a lot of things that they weren't expected to do in a traditional environment. They

Local manufacturers sponsor students who design and build remote-control robots to do battle with robots from other schools. The program exposes students to all facets of manufacturing.

our new hires are referred by someone who already works at Daman. I was at lunch yesterday with a fellow who has been with us 4 weeks. A longtime employee had been working on this guy for 9 months."

Even more notable than the new employee's entree to Daman was his background: managing a fast-food restaurant. They don't make up a large percentage of Daman's employees, but "over the years we've had some decent experience with hiring fast-food managers," Davis said. "They tend to be overworked, underpaid and certainly underappreciated. The prototypical fast-food manager tends to have a great work ethic."

Krysten Shoulders, Daman's human resources manager, said fast-food managers understand that the customer is number one. "It's a focus on making my customer happy no matter what," she

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assume that's their manager's job, and they believe that their manager is making more money than them to make those decisions."

In many cases, advanced technical skills are unnecessary. Daman recruits people who can communicate, work well on a team and thrive in an environment where they are accountable and work without supervision. Davis said many machine operators today "are not

machinists like they were 40 years ago, where you gave them a blueprint and a block of material. The machines are doing a lot of that technical stuff."

Consequently, Shoulders devised a short shop-floor test to evaluate prospective employees' skills and how they will fit in. She called the test "our hands-on assessment, a mock standard operating procedure [SOP] that we do out in the shop." After a facility tour and

a discussion of Daman's work environment, Shoulders outlines the test assembly procedure, emphasizing its step-by-step nature and the necessity to follow instructions. "Then I let them do it," she said. Some instructions are intentionally vague, offering a chance for the candidate to show initiative and "an opportunity for them to ask a question, for them to communicate a little bit," Shoulders said.

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Promoting a better image for manufacturing jobs helps create awareness, but companies with worker-friendly, teamwork-based environments can add another incentive for recruiting and retaining employees.

Daman recently realigned its training programs with its operating philosophy. Until mid-2006, on-the-job training was inconsistent due to production demands and different personal styles. The company had developed detailed SOPs for all of its processes, but training usually was limited to co-workers showing new employees what was needed in a particular cell at a particular time. "They were being trained, but it didn't feel like training," Davis said.

Daman decided that training should mirror the way the company operates. Lesson plans were developed based on the detailed SOPs, and plans were posted on an Intranet program called Training to Achieve Goals. In the program, an employee is given a goal of completing a lesson plan by a specific time, as well as a list of the people or resources needed to learn the procedure. "It's the trainee's responsibility to find the person who can train them, make an appointment and get that training," said Davis. When finished with the lesson, the trainee logs it on the system.

Daman also offers its employees classes

in life skills. Topics include preparing healthy meals and basic financial management. "Too much of industry is focused on the manufacturing process and disregards the people performing it," Davis said. "We will continue to add learning opportunities. Why not give them skills that can help them here and in their fam-

ily lives? About 5 years ago, we realized that our passion is to help our customers be successful. From that sprung this idea that if we expect our people to be helping our customers, we need to back up and help our employees more."

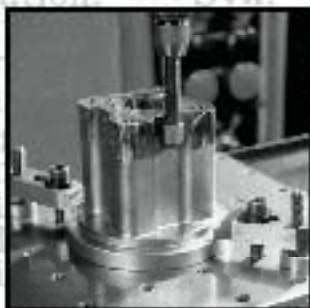
Employees who are comfortable with the Daman philosophy tend to last.

Davis said turnover among those with less than 2 years of employment has fallen from 34 percent a few years ago to 17 percent now; among those with longer tenures, turnover is just 2 percent.

While their approaches may differ, manufacturers and technical educators share the same goal: to recruit and retain talented, technically proficient employees who can operate modern metalworking processes. The future of U.S. manufacturing depends on it. CTE

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