Preparing the next generation

By Meg Fry, June 29, 2015 at 3:00 AM

Gale Tenen Spak grows anxious when she walks into a manufacturing facility that looks as if it hasn't changed much in 30 years.

“I walk into a company that makes parts for defense contracts, and they’re using a machine that’s 100 years old, with the only one who knows how to operate it in his 70s and living next door,” said Spak, associate vice president for continuing and distance education at the New Jersey Institute of Technology in Newark.

“Manufacturers not only have to invest in changing their processes and updating their equipment, but also the ways that men and women can be professionally developed for such careers,” she added. “This is not your grandfather’s manufacturing anymore.”

Not when the average employee, according to the National Association of Manufacturers, is making about $90,000 a year.

“It’s all robotics and automation these days on complex machines that could cost $2 to $3 million — which requires additional knowledge that Rosie the Riveter did not need,” Spak said.

“You wouldn’t let just anyone with a general high school degree work on these sophisticated machines anymore.”
Still, the manufacturing sector’s image problem persists, creating a major headache for the state.

With 10,978 manufacturers in New Jersey and some 400,000 employees, the sector accounts for nearly 90 percent of the state’s exports and about $40 billion of annual output.

Yet thousands of jobs are still unfilled.

“The biggest fear of New Jersey manufacturers is the aging of their workforce,” Spak said. “They simply cannot find young, new technologists and trades to ensure their companies stay in business.”

According to the New Jersey Department of Labor and Workforce Development, less than 25 percent of the total workforce in the state is under age 35.

And with the average retirement age being between 55 and 65 in the industry, the manufacturing sector is soon set to lose at least 25 percent of its remaining workforce.

The state knows it’s a problem.

That’s why, four years ago, it put Spak in charge of leading New Jersey’s Advanced Manufacturing Talent Network — aka ManufactureNJ — out of NJIT.

Directed by Ray Vicarrio, ManufactureNJ strives to stabilize and develop a highly trained workforce for New Jersey manufacturers by operating in partnership with educators, manufacturers and trade organizations.

Since its creation, the network has helped facilitate important conversations on how to ensure younger generations embrace manufacturing as they move beyond college and into the workforce.

One such discussion tackled how to change curricula to reflect industry-driven knowledge, including Andrew Campbell, CEO of Eastern Millworks in Jersey City, as well as representatives of High Tech High School in North Bergen and NJIT.

The result? Force21 in Hudson County.

“This program focuses exclusively on an education pipeline for middle and high school students in design, engineering, fabrication and mechatronics, and, more specifically, on a workforce for Eastern Millwork,” Spak said.

High Tech High School in North Bergen opened the doors to its new Academy of Architecture and Engineering last fall and unveiled its newly created curriculum, completely aligned with the needs of Eastern Millwork and other manufacturers brought into the discussion. In its first year, 70 ninth-graders signed up.

“High Tech High School” — in conjunction with Hudson County Community College — “will be the first in the state to award an associate degree to students by the time they graduate high school,” Spak said.

“They will also concurrently earn an industry-vetted certification in mechatronics.”

This, in turn, creates a clear pathway straight to NJIT, which changed courses within its bachelor’s of science in engineering technology degree so students might continue their education in manufacturing.

When word got out about Force21’s curriculum, the calls came rolling in from other counties, Spak said.
“Community colleges can adapt to their local circumstances and companies,” Spak said. “New Jersey educational institutions have a guidebook now with a curriculum that we know manufacturers want.”

It’s why Spak hired Executive Director Ian Trammell to head a similar statewide program called MechaForce, open to all ages and currently in nine counties.

The first applicants will start this fall and be ready to work after four months of education and on-the-job training.

Also, MechaForce has applied for a federal “American Apprentice Initiative” grant to prepare 500 New Jersey men and women to become mechatronic apprentices in nearly 55 manufacturing firms.

The grantees will be announced in September. If NJIT is among them, it will receive $3 million that will be matched by another $2.5 million in state funds.

Still, MechaForce is moving forward regardless. Spak said: “We have support from the industry. It’s real skin in the game.”

Judy Savage, executive director of the New Jersey Council of County Vocational-Technical Schools, agrees that this is the right course of action.

“Our schools are moving to address the skills gap in a pretty aggressive way by creating new programs that begin preparing high school kids for careers in manufacturing,” Savage said.

Successful programs — such as a new program in Bergen County via Applied Technology High School, and another run by Morris County Schools of Technology — have “more than filled their classes for September” by advertising their programs to eighth- and 10th-graders, Savage said.

But she also sees another solution to the skills gap: Across the board, vocational-technical education is becoming more popular than ever.

The statewide average is 2.5 applicants for each available seat.

“Vocational-technical education is very different than it used to be,” Savage said. “It’s not just specifically about getting a job anymore — the programs that are being designed and implemented are much more broad-based now in terms of educating students for a career pathway.”

Trade groups are catching on, too.

According to the New Jersey Manufacturing Extension Program, the most needed positions in 2014 were technical salespeople; CNC programmers and machinists; certified welders; and cost accountants.

So NJMEP created Experience Manufacturing to directly connect and match summer job seekers age 18 and older with such manufacturing vacancies in the state.

“We not only have to re-educate our youth, but also their parents, that there are tremendous opportunities in S.T.E.M. and manufacturing,” said John Kennedy, CEO of NJMEP. “When you hear for the last 30 years that manufacturing is dead, you start believing it.”

It’s up to the employers, Savage said, to change that perception.
“We need employers who are going to roll up their sleeves and help the schools design curriculums that will get students into their facilities. We can’t meet employers’ needs if we don’t know what they are.”

In addition to finding more manufacturers to work with schools and trade organizations to provide opportunities for site visits, mentoring, job shadowing and internships, it’s also important to analyze and cater to the millennial mindset.

Alan Haveson, president of the New Jersey Tooling and Machining Association — which, just last year, invested $200,000 in grant funding from the state to establish a machinist and welder training program with Burlington County College — believes the uphill battle can be won.

“Right now, I think the most pressing concern for millennials is to find a job that they can, at least, support themselves (with) and pay down any loans they may have accumulated,” Haveson said. “But they are also obsessing about future opportunities; the challenge is to reconcile expectations and realities.”

Many students and young workers, however, may not even be aware of just how many high-paying and interesting jobs are available in manufacturing.

“What kind of company is Apple? Most people will tell you it’s a technology company,” Kennedy said. “But don’t they manufacture a lot of the products that we buy?”

“If you ask most young people if they’d love to work for Apple, they’d tell you, ‘Yes.’ ”

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Mobile manufacturing

Maybe the push for manufacturing education is working, or maybe it’s just that millennials believe that training in a 6-ton “mobile lab” sounds like something Batman would do.

Whatever the case, Sivaraman Anbarasan — executive director of the New Jersey Community College Consortium for Workforce and Economic Development — sees the difference the two mobile manufacturing classrooms have made in employment gaps since launching last year.

“Before we begin training, we speak to employers in an area to gauge job openings over the next three to six months,” Anbarasan said. “If there is sufficient demand for manufacturing technicians, we can do the class right in their neighborhood at a local community college using the mobile labs.”

Some 260 people have already completed the 300-hour entry-level curriculum to learn metal fabrication using computer numerical control or mechatronics — with nearly 90 percent receiving job offers with partnering employers after earning their professional certification.

It isn’t easy, though.

“Our extensive application process keeps retention high and prepares reliable employees,” Anbarasan said.

The New Jersey Council of County Colleges and NJCCCWED received a $10 million U.S. Department of Labor grant in October to aid the long-term unemployed in the state over the next four years. In addition, the state of New Jersey will provide $2 million to assist in this effort.
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