Skilled labor emerging to meet demand for manufacturing jobs in area

By Matthew Tota, Correspondent
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WORCESTER — Dhalin Lutaaya's thoughts went to a dark place the first time his older brother suggested he enroll in a local community college's manufacturing program.

Mr. Lutaaya pictured oil-stained peons laboring over mindless tasks on a gray, grimy factory floor. And with this image in his head, why would he spend two or more years learning about manufacturing?

On a sort of sabbatical after high school, Mr. Lutaaya knew he loved computers and had picked up a little programming, another reason why the idea of working in a factory — given what he thought about manufacturing at the time — did not appeal to him. But he also looked up to his brother, a mechanical engineer, and respected his opinion, so he decided to give the program at Quinsigamond Community College a shot.

Now in his final semester, Mr. Lutaaya already has a manufacturing job at a shop in Waltham. The QCC program hooked him, along the way instilling a brighter image of manufacturing in his head: The grit and grime wiped away, replaced by him proudly programming a shiny robot to perform intricate tasks.

"Initially, I did have a negative perception of manufacturing; I think most people who don't know a lot about manufacturing do," Mr. Lutaaya said. "But getting to learn about the new technology implemented every day and looking at companies like Tesla or SpaceX — companies leading innovation in America — you realize manufacturing is a lot more than dirty equipment."

Unfortunately for manufacturing companies here, potential employees like Mr. Lutaaya — at the ready with all the skills to jump into a job — have proven harder and harder to find. And in recent years, training more of them has become crucial to turning around the industry's long-running workforce shortage, a crisis that, nationwide, manufacturers expect will only get worse in the next decade.

In Massachusetts, home to about 7,000 manufacturing companies, lawmakers, school officials and manufacturers have met at roundtables and chamber of commerce meetings to discuss the need for a pipeline of skilled workers. The state has formed a Legislative Manufacturing Caucus and spent millions of dollars in workforce development. Last week, the state announced $2.5 million for advanced manufacturing training.

In this region alone, the Central Massachusetts Workforce Investment Board has spent at least $10 million over the last 10 years on creating new ways to train future manufacturing workers.

And for adults, MassHire's Workforce Central Career Centers, in Worcester and Southbridge, have a trove of information on manufacturing for job seekers, directing them to training programs.

Manufacturing employs about 247,000 people in the state, and while that number has ticked up about 2 percent since May 2017, it is well below the more than 490,000 people the industry employed in 1990, according to the state's Executive Office of Labor and Workforce Development.

Recent growth

Still, local manufacturers have said that the industry's recent growth shows no signs of waning. Total economic output for manufacturing reached $50 billion in 2017, or about 10 percent of the state's output, according to the Massachusetts Manufacturing Extension Partnership (MassMEP).

And the focus on building a new workforce has paid off. There have never been more pathways for people to gain the skills needed for a job in today's high-tech manufacturing sectors, experts say, whether teenagers in middle school or high school, college students or adults (those looking for a new career or current manufacturing employees who need retraining).

"We are rich in this area in terms of educational programming around manufacturing," said Rachel Frick Cardelle, Mount Wachusett Community College's vice president of lifelong learning and workforce development.

Many of the pathways developed seek to give rounded instruction in everything from blueprint reading to CNC machining — the platform used to control machines on a factory floor — to lean manufacturing, essentially instruction in how companies become more efficient by producing more, faster, with less.

Two years ago, Gov. Charlie Baker and Lt. Gov. Karyn Polito teamed with 10 vocational high schools and a host of community colleges to provide 300 hours of manufacturing training, on nights and weekends, for adults interested in gaining an associate's degree. The state expected about 300 students in the first year of the program, with them leaving with a vocational certificate worth college credits toward a two-year degree in manufacturing.

In Central Massachusetts, Mount Wachusett's TechHire Grant Program will train about 400 students ranging in age from 17 to 29 in robotics and automation at the Devens campus; Mount Wachusett has even offered training to prisoners, with Ms. Cardelle noting that, at this point, manufacturers "are less than picky."

New manufacturing program

One of the newest local pathways is the Blackstone Valley Education Hub's Advanced Manufacturing Career Readiness Program, funded in part through a $95,000 grant from the U.S. Department of Labor. The hub — decked with miniature versions of many of the same machines

found on factory floors — will serve as a remote classroom for 10 high school districts, with the lessons in manufacturing developed in collaboration with local companies.

Many of these avenues end with participants leaving with at least a certificate and enough knowledge to begin working for a manufacturer. More often, they move on for further education at a two-year or four-year college. (According to a recent Michigan State University study, candidates with a bachelor's degree can expect to see a starting salary of about $53,000 a year at manufacturing companies.)

Yet no matter how many new pathways are established, one glaring problem remains: persuading people to commit to a career in manufacturing. To that end, the marketing around the industry — the tagline that this is not your father's or even your grandfather's factory floor — has tried to change old perceptions.

"There are more defined pathways to manufacturing jobs today, but the challenge has been to populate those pathways," said John Killam, president and CEO of MassMEP. "Has the rhetoric taken hold? I believe manufacturing is getting a better reputation, considering a lot of the technology that Massachusetts is involved with, particularly around the innovation institutes and the investments in the life science and biotech sectors. The challenge, though, is getting the word to those potential candidates for manufacturing jobs."

So far, there is no sign that the skills gap for manufacturing is closing; indeed, it may be widening.

By 2028, the skills gap in U.S. manufacturing is expected to increase from nearly 500,000 unfilled jobs to as many as 2.4 million, according to a joint-study by Deloitte and The Manufacturing Institute, potentially costing the industry $2.5 trillion over that period.

It is a grim statistic that has tempered manufacturers excitement over last year's job numbers — 284,000 jobs added in the U.S., the most since 1997, according to the National Association of Manufacturers — and left them worrying instead over how to fill those new positions.

"Right now, the limiting factor to our growth is manpower: finding skilled labor and developing people," said Bob Hellinger, president of Emuge Corp., a German toolmaker preparing to open a new manufacturing plant in West Boylston that will create about 20 jobs.

Overall, the Deloitte study found that five out of 10 manufacturing jobs remain open, including such positions as production workers, engineers, researchers, scientists, software engineers and operational managers. And the top reason why those jobs go unfilled is the negative perception of the industry.

Aging workforce

An aging manufacturing workforce is compounding the struggle to find new talent. Manufacturers often tout how many of their employees have notched long careers with their

companies. In the same breath, though, they acknowledge that their aging staff will soon retire, leaving gaps that cannot be filled.

In Central Massachusetts, the Worcester Regional Chamber of Commerce said it anticipates that in the coming years local manufacturers will see a wave of retirements, leading to more than 20,000 short-term, entry-level openings for CNC machinists, quality control technician and production line workers — jobs that pay an average of $39,000 a year and don't require a college degree.

"The baby boomers, from what I'm seeing, are not in a hurry to get out," said Mr. Killam. "The money is good, and they want to make hay as long as they can. But this is definitely a good time for someone younger to be mentored by them. It's not going to be long before they start to retire, and we'll need to replace them."

Many manufacturers and others working to address the skills gap believe filling the pipeline to jobs will require sparking interest in middle school and high school students.

To that end, the Worcester Regional Chamber of Commerce last summer partnered with the Worcester public schools for a free, four-week program to teach students a variety of skills that manufacturers have said they need to see from potential candidates, including shop safety, basic math and blueprint reading. The 15 students who complete the program will receive a guaranteed interview with a manufacturing company.

The issue of hooking high school students remains, though. And the messaging around how to get them jazzed about manufacturing has been largely flawed, according to Jeff Turgeon, the Central Massachusetts Workforce Investment Board's executive director.

Too much pressure has been placed on young people to pick a career, Mr. Turgeon said, and with manufacturing, the pitch that they will find a high-paying job that can sustain them through the rest of their lives has been ineffective.

"Our operating principle as agencies and others working on this has been about kids having a career plan that we need to influence; we need to get with young people and their parents to get them to change that plan," he said. "But what you find out is most people — even those who go into manufacturing — don't start there. Most people don't have a career plan."

Mr. Turgeon believes the best course involves exposing students to the industry, to the idea simply of making things, without forcing any expectations on them. He has reached out to manufacturers with a plan that would involve them bringing on students for paid internships, providing the opportunity for them to learn a skill while making money. His hope is to work with manufacturing companies to create at least 100 new paid internship opportunities.

"It is the idea of paying for interns as a means to create career awareness and exposure: You know they will not bring a lot of value up front, but it's an investment in the future," he said.

Worcester Tech

At Worcester Technical High School, Drew Weymouth is setting up the internship component of the school's new Innovation Pathway program for advanced manufacturing. The career training program, open to students at the other high schools in the district, will take place during the afternoons after the regular school day.

In addition to a college and career readiness course as well as technical and vocational and college classes, Mr. Weymouth wants to have students complete a two-year paid internship, with at least 100 hours of work in the second year.

While Mr. Weymouth is confident he can line up paid internships in the three other technical fields the program has focused on — allied health, information technology and civil engineering — he is worried about bringing his proposal to manufacturers.

"I'm concerned about the manufacturing field, specifically about them being able to follow through on the paid internships," he said. "We have a backup plan if they can't, but I need to be able to get students into these companies."

Worcester Tech has spent thousands of dollars on its manufacturing program, which has seen its enrollment triple in the last five years, upgrading its factory floor classroom with some of the same computer-controlled machines at the manufacturers in the area. And the school has listened to what skills manufacturers want to see from potential candidates and tweaked its curriculum accordingly.

One shift has been to students starting to work on the machines as freshmen, then gradually learning about the technology as they progress toward their senior year. They recently have begun learning about precision measuring, using more and more advanced measurement equipment as they progress through the curriculum.

Yet Worcester Tech students are not landing jobs, said Brian Cummings, head of the advanced manufacturing department.

"The manufacturers have supported each initiative; they'll write letters, and they'll speak at every event. But at the same time, they're working hard to adapt to their retiring workforce rather than replace them with all the talent that's coming out of vocational schools," Mr. Cummings explained. "We're hearing their call to create opportunities and pathways, including an educational model that reflects what they want. But then I have a whole bunch of kids ready to go to work, and those same companies are not hiring our graduates."

High school grads

Manufacturing companies have been loath to hire high school graduates in part because they feel they lack "soft skills," according to Patricia Suomala, Worcester Tech's director of career and technical education.

"They worry about the soft skills, like promptness. Those skills that will make them good employees," Ms. Suomala said. "But if they had students in for an internship or a co-op, they

would see all of those things before they even had to invest in hiring the student. Even for entry-level positions, I think they're concerned about hiring high school graduates."

When it comes to having students get jobs after completing school, Quinsigamond is facing the opposite problem with its two-year manufacturing technology associate's degree program.

"There have been very few examples of people who've come through our program and not found jobs," said Damian Kieran, one of the program's two professors. "We get emails all the time from our career services people, telling us this company is looking for people, and do you have anyone in mind. And we're scratching our heads, going, 'Actually we don't: Most of our students are already employed.'"

Tom Dorman, a senior in the manufacturing program, already has a job he loves at Methods Machine Tools in Sudbury, in the company's automation department. Part of Mr. Dorman's job is programing robotic arms to perform tasks for other manufacturers, such as loading and unloading parts in a machine.

"There is room to grow where I'm working; I've been with the company for two years now, and I've already learned a ton," Mr. Dorman said. "I've gotten my hands on a lot of really cool technology. I'm learning about new systems and machines every day."

Mr. Kieran said he cannot train students fast enough for manufacturers, and the program itself has more room to grow.

"We're trying to increase our pipeline, now reaching out to high schools. But it's a marketing challenge to get people involved in manufacturing," he said. "We're positioned to train them. We have all this equipment. And we're growing, but we could grow faster. We can deal with more students and scale up."

Adult students retraining

Besides inviting high-schoolers to check out the gadgets, like a laser cutter and a 3D scanner, in its QuEST Center, QCC has also brought in adults from manufacturing companies for retraining and certification courses.

Its latest batch of older students included about 26 employees from Karl Storz, a medical device manufacturer in Charlton. The company paid their tuition and allowed them to take the safety certification courses around their shifts at the factory.

Lee Duerden, QCC's other manufacturing professor, said manufacturers have been more willing to make accommodations with their time, money and immense production demand in the hopes of gaining new employees or retraining existing ones.

"There are a lot more companies paying tuition than not, and there are a lot more I'm finding over the last two years offering to work with their schedule and a student's schedule, which five to 10 years ago was unheard of," Mr. Duerden said. "If you were on first shift, you had to be

there. But now we have these companies that realize they have to work with the student schedule, which is incredibly challenging for them, because they have to meet customer demand, as well."

At Wirefab Inc. in Worcester, 10 of the firm's 50 employees have come through a training program or are going through one now, said president James Samsel. Wirefab, which makes products out of metal wire, has been among the region's many manufacturers that have taken an active role in creating pathways to fill vacancies, with Mr. Samsel serving on the advisory board for the Blackstone Valley Education Hub.

"We want to create a path for people to grow and help them to understand that there is a career here," he said. "You just can't bring people in, put them on a machine and forget about them. You've got to work with them to create a career path. We want to provide the education for them to advance in their career."

But Mr. Samsel admitted there is only so much his company can to do woo new candidates and alter their opinions of manufacturing. He hopes to see those efforts coming more from parents and guidance counselors, even from young people themselves.

Even as he's locked into his own path in manufacturing, Mr. Lutaaya, the QCC senior, has not forgotten how his own negative perceptions of the industry were shattered. He's working on a project for high school students: a promotional video to pique their interest in manufacturing, as his older brother did for him.

Through the footage he shot, he said, "I'm trying to give them the idea that there's a lot more to manufacturing than meets the eye. There are a lot of cool things involved, from programing robots to learning how to deal with CNC controls that are so precise and can perform so many different functions. It was a lot of showing off the technology and showing how you can build something from scratch."