

Reshoring remains an uphill battle until we find and train more workers

MEET YOUR NEW APPRENTICE



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Jimmy was a crusty old machinist and part-time farmer from Belle Plaine, Minn. He knew more about cutting metal than anyone I’ve ever met. He was also my friend. I was 17 years old and starting a new job as a handscrew operator in nearby Chaska when Jimmy took me under his wing, showed me the ropes and corrected my many mistakes.

I was fortunate to have a mentor. Many of my generation did not. And in

the years since then, many more young people were told that the trades are dirty and the best way to succeed in life is with a college education. As a result, tuition rates skyrocketed and young people accrued colossal amounts of student debt as they flocked to universities.

On top of this came the North American Free Trade Agreement in 1994, stringent regulatory policies, low-cost goods from China and aging infrastructure, all of which drove manufacturing elsewhere and contributed to the gradual decline

South Carolina Lt. Governor Pamela Evette congratulates the first class of BMW Rising Scholars, a one-year pre-apprenticeship program that allows high school seniors to work part-time at BMW Manufacturing while earning a high school diploma. (Provided by BMW Manufacturing)

of America's industrial sector. But times are changing, thanks to a new generation of leaders.

FAME Works

Tony Davis is the national director for the Federation for Advanced Manufacturing Education (FAME USA). It's a workforce development organization with nearly 40 chapters throughout the United States that falls under the purview of the Manufacturing Institute (MI), which is the workforce development and education partner of the National Association of Manufacturers (NAM) in Washington, D.C.

"NAM is the country's largest trade group and represents well over 13,000 manufacturers of all sizes," Davis notes. "It is the voice of manufacturing at the federal policy level. The MI, on the other hand, runs a series of programs that help companies meet their workforce needs. Unfortunately, that need is acute in many places."

It's an impressive list of educational initiatives. There's the nationwide Manufacturing Day held on the first Friday in October each year, designed to bring together students, parents, educators and community leaders to promote the industry's many opportunities.

Heroes MAKE America works with community colleges to help prepare transitioning service members and military reservists for careers in manufacturing, while Women MAKE America is building a strong network of honorees and mentors that continue to support women and close the gender gap in manufacturing. And FAME USA aims to provide "global-best workforce development through strong technical training, integration of manufacturing core competencies, intensive professional practices and intentional hands-on experience to build the future of the modern manufacturing industry."

As Davis can attest, one of the best ways to achieve all this is through apprenticeships, which allow students to earn a living wage while learning the vocational skills they and their employers need. "The

apprenticeship model is very impactful," he says. "The ability to learn a skill in the classroom, go to work and utilize those skills, and then head back to class to reinforce the real-world experience, over and over again. It's powerful."

Neither he nor NAM can take credit for FAME's creation. That was Toyota Motor North America, which



The Siemens Empowers Education and Startups program is designed to create a more innovative and sustainable future. (Provided by Siemens Digital Industries Software Inc.)

began developing the program about 30 years ago in response to the growing labor crunch. The program was so successful and the results so crucial to the U.S. economy that the automaker agreed to transfer FAME's management to MI in 2019. Davis and his colleagues have since taken the educational ball and run with it, and the program now stands poised to go nationwide. "We're serving well over 400 employers across the network of 14 states and nearly 40 chapters, with more on the way."

Automotive roots notwithstanding, FAME isn't about teaching people to build cars. As apprentices in the Advanced Manufacturing Technician (AMT) program, students learn about various topics, from welding and PLCs to electricity, robotics, fluid power and mechanical skills. But they also pick up less hands-on (though equally relevant) skills such as problem-solving, safety awareness, workplace organization and lean manufacturing.

With that are the soft skills, Davis adds, listing learning to speak to groups, making eye contact and

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even simple things, such as tucking in your shirt. Students learn teamwork and communication, responsibility, diligence and initiative—all the personal attributes an employee needs to succeed.

“We had more than 1,000 students in 2022 and expect even more this year,” he says. “I’m very proud of where we are with this program and all that NAM and MI bring to the table.”

The Ultimate Learning Machine

Toyota hasn’t been the only automaker to struggle with worker shortages. BMW Manufacturing Co. in Greer, S.C., launched its apprenticeship program in 2012 to counter this pervasive problem. It has since produced more than 400 graduates who have assumed different roles throughout the 11,000-employee, 8-million-sq-ft (743,000-sq-m) Spartanburg assembly plant, according to Paul Sinanian, manager of the facility’s talent and training department.

“The original program, what we call our Classic Scholars, was designed to develop skills and career paths in information technology, logistics, mechatronics and automotive manufacturing,” Sinanian says. “It’s a two-year program that’s evenly split between hands-on learning at the plant and attendance at an area technical school or community college, which allows students to earn an associate degree and the money to pay for it.”

For those who already have an associate degree, BMW added a Fast Track Scholars program two years ago that gives employees a chance to further develop their careers with one year of on-the-job training (culminating in a bachelor’s degree). And to entice next-generation workers, the automaker is engaging with local high schools by offering two apprenticeship programs—a one-year automotive manufacturing certificate; and the Rising Scholars program, where seniors can work 15 hours per week at the BMW Training and Development Center while earning a high-school diploma.

“Each of these programs presents a career advancement path that, if you choose to continue your education, provides avenues for you to do that,” he says.

The push into high schools is a brilliant idea. Many in this age group are scratching their heads about what to do after graduation, but they’re also less interested in manufacturing than they once were, a natural consequence of the “trades are dirty” mindset the U.S.

fell into several decades ago.

BMW hopes to change this, giving people a path toward a good-paying, rewarding career and paying them to pursue it. At the same time, the company is building a talent pipeline that will help it and their suppliers meet production goals.

Pipeline or not, BMW is making a significant investment. What happens when a student graduates and decides he doesn’t like manufacturing, or maybe would prefer building Ford or Hyundai cars?

Nothing at all, actually.

“We need people hungry to learn, who want to make a career here and never leave,” Sinanian says. “And we’ll do everything possible to achieve that by educating them, keeping them up to date, inspiring them and ultimately making them part of a family that enjoys coming to work and solving problems.

“That said, there’s no financial commitment,” he continues. “The people entering the workforce today have a different mindset about certain things, and we as an industry must adjust to their needs. Some of this is ensuring that, as part of the recruitment process, they understand what’s required for someone working in an advanced manufacturing environment.”

Filling the Leaky Pipeline

That’s good advice, no matter what you manufacture, and is especially relevant when there aren’t enough workers to go around. Dora Smith, senior director of the Global Academic Program at Siemens Digital Industries Software, attributes this to several factors, COVID and the “Great Resignation” among them. Whatever the causes, though, the software developer is taking steps to fill a pipeline that Smith calls “leaky,” explaining that one of the biggest challenges is a shortage of talent going into STEM [Science, Technology, Engineering and Mathematics].

“This is especially true of young girls, who typically lose interest during middle school,” she says. “Add to this the aging workforce and resultant retirement boom, and we’re left with a problem that will take some fairly drastic measures to correct. That’s why we’ve engaged with more than 4,000 partner schools globally and are working hard to do our part in developing a future-proof workforce.”

If it were simply a matter of replacing old workers with new ones, the problem would be far more

manageable. But technology is moving faster and faster. Workers today must not only keep up with this rapid pace of change, but learn “a higher level of advanced digital skills” as they go. Fortunately, the Plano, Texas-based company is tackling this need head-on through its Siemens Empowers Education and Startups program, which Global Strategy Leader Shannon O’Donnell describes as a means to enable lifelong learning.

“The goal here is to create a more innovative and sustainable future,” she says. “Our program provides educators and students with access to the software, curriculum, training and credentials that are focused on solving the challenges of tomorrow.”

One of these challenges is sustainability. O’Donnell notes that during a recent survey of 650 students worldwide, three needs emerged: hands-on learning, student creativity and embedding sustainability into education. Siemens has addressed this last deliverable by creating the Skills For Sustainability Network, a program that “supports educators in uniting towards this common goal of integrating sustainability in a manner that makes sense in their classroom, while simultaneously enabling the global workforce to develop solutions in a more circular economy.”

O’Donnell adds to this, pointing out that there’s much more to workforce development than teaching young people and their instructors how to use advanced manufacturing software. “That would be like handing a kid a soccer ball and telling them to go win the first game,” she says. “You have to give them the knowledge and tools needed to manipulate that soccer ball, as well as the practice to become proficient at it.”

They must also understand the context. O’Donnell shares one of her favorite stories, that of a first-year student who would soon be attending the University of Michigan. “I was sitting in an interview with a soon-to-be engineering student when the interviewer asked the young woman to tell us about her experience with CAD software. You could tell by the look on her face that she

had no idea what CAD was, so we explained it to her, and then a few minutes later, she said, “Hold on, I race cars. Could I use CAD to figure out how to manufacture a broken part?” It began to make sense once she put the concepts together in a real-world application, and she’s since gone on to become a mechanical engineer.”



Alamo AMT students collaborate on a hands-on educational project. (Provided by The Manufacturing Institute | National Association of Manufacturers)

A Digital Toolbox

It’s not just part-time racecar drivers who need a leg up into the digital world; there are also those who’ve made unfortunate choices in the past and want to make a better life for themselves and their family. Brooklyn-based advocacy group Vera Institute of Justice seeks to help these individuals by working to expand high-quality postsecondary education in prison. Vera’s Unlocking Potential initiative promotes equal access to educational opportunities and reduces inequities to increase college access and completion, which can be life changing.

“The Bureau of Justice shows that when inmates obtain a credential or degree while incarcerated, they are 43% less likely to re-offend than those without education,” says Gretchen Schultz, director of workforce development for Tooling-U SME, Southfield, Mich., adding that, while such positive outcomes are undoubtedly good for the inmate, they also benefit society

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as a whole. “Thanks to the work of Vera, Community College Prison Education Programs (PEPs) and community-based organizations such as Goodwill Industries, inmates not only have a skillset when they leave, but they have a job waiting for them. It’s life-changing.”

Tooling U-SME plays a role in this rehabilitation through a comprehensive suite of learning materials, training plans, nationally recognized certifications and online classes. Of course, these offerings extend well beyond the prison walls. Schultz and her colleagues work with schools, businesses and workforce organi-

apprenticeship grant from the U.S. Economic Development Administration’s \$500 million Good Jobs Challenge program, money it’s using to establish manufacturing-based apprenticeships throughout the state. And CareerWise USA out of Colorado is “building a nationwide movement that efficiently develops and expands high-quality, modern youth apprenticeship systems by providing best-in-class tools, technology, consulting and collaborative learning experiences.”

There are others. Many partner with Tooling U-SME, some do not, but all share a common goal of bringing workers into the trades.

For example, Workshops for Warriors is designed specifically for veterans transitioning into the civilian workforce, and it provides training and apprenticeships in technologies such as CNC machining and welding.

General Electric’s Apprenticeship Program offers apprenticeships in advanced manufacturing, engineering and IT. Skill-



A bird’s eye view of the Louisville FAME Technical Center. (Provided by The Manufacturing Institute | National Association of Manufacturers)

zations across the country to bring people of all ages into the trades. And as Tooling U-SME Senior Director Chad Schron explains, apprenticeships are one of the most powerful tools available to accomplish this.

“The Department of Labor has put a huge emphasis on apprenticeships as a way to attract people into the industry,” he says. “Further, employee-retention rates are generally higher with apprentices because the company has invested in these individuals and wants to see them succeed.”

Schroen named others seeing similar results, many leveraging the organization’s training materials. These include the Manufacturers Association of Central New York, a regional manufacturing association that “has done incredible things with apprenticeship programs” for small- to medium-sized manufacturers. The Ohio Manufacturing Association received a \$23.5 million

sUSA works with students, teachers and industry to ensure America has a skilled workforce through educational programs, events and competitions that support careers in technical and skilled service occupations, including manufacturing. The list goes on.

“Forbes magazine published an article two years ago that cites an alarming statistic: Less than 60% of college students earn a bachelor’s degree, even after six years of attendance, with community colleges faring even more poorly,” notes Tooling U-SME’s Schultz. “Worse, not all high school graduates go to college, nor do they go into the armed services. So what will this large population of young people do for a living? How will they support themselves, pay taxes, raise families and do all the other things that are only possible with a good-paying job? Apprenticeship is an excellent pathway for these people and many others like them.” ☎

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