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## Future-Proofing the Manufacturing Workforce: The Role of Industry in Education

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This article first appeared in [Quality Magazine](#).

The role that automation plays in the future of our country has never been more relevant.

As companies strive to bring production back home to strengthen economic resilience and ensure operational stability, reshoring manufacturing is becoming increasingly important. But the success of this movement hinges on one critical factor—a highly skilled workforce ready to support the future of advanced manufacturing.

Results of last year's Deloitte and The Manufacturing Institute Talent Study[1] provide deeply concerning estimates on the challenges we may face. According to the study, an estimated 3.8 million manufacturing jobs will need to be filled over the next decade, yet half of those positions are likely to remain vacant.

Across the U.S. and around the world, preparing the next generation with the education and training necessary to excel in the era of automated manufacturing is not just important—it's essential to ensuring long-term innovation and competitiveness.

And the very first step in doing that is introducing today's students to automation before they've chosen an alternative career path.

In theory, this task may not seem challenging. Simply introduce students to robotics at younger ages, right? That's certainly one component. But in my 30 years focusing on automation education at robotics manufacturer FANUC America, I've learned that progress requires much more than that.

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To effectively future proof the manufacturing workforce, both industry and education need to join forces and rewrite the rules.

Here are four factors that I believe we as an industry need to closely study, honestly evaluate our contributions to, and commit to work towards—today.

## **Rebranding manufacturing**

Ask a high school student what they've learned about manufacturing in their current classes and it's not unlikely that you'll hear anecdotes pulled from history textbooks. Black-and-white images depicting the Industrial Revolution and implementation of the assembly line spring to mind.

While automotive assembly line automation is at the heart of much of the work done at our headquarters, located on the outskirts of the Motor City, it barely scratches the surface of the breadth of current innovation and opportunity that exists across every industry and application.

From e-commerce to pharmacy to the food and beverage industry, the need for consistent throughput, increased productivity and high-quality output is a common goal. And thankfully, a competitive automation landscape made up of innovative robot and cobot manufacturers and integrators continues to push out new and noteworthy systems that are working to change the narrative formed from out-of-date perceptions of manufacturing.

Recently, we asked students about their perception of careers in automation. While our sample group came from the floor of a manufacturing tradeshow, likely indicating an existing interest in robotics, we were surprised by the overwhelming positive response. Students described the field as innovative and exciting—words that reflect the rapidly evolving, high-tech nature of the industry.

Their enthusiasm is exciting. Now we just need to spread the word.

Events like National Manufacturing Day and other STEM-driven initiatives provide an invaluable opportunity to further shape students' perceptions by offering up-close experiences with real-world automation technologies. By welcoming students into industry facilities, including our headquarters in Rochester Hills, MI, we offer an immersive learning environment that highlights the vast career potential in robotics and automation.

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## **Getting hands on robots in high school**

Immersion in automation tradeshow and manufacturing facility tours is one way to pique interest in advanced manufacturing, but our research shows that the game-changing factor in pursuing a career in it is the age at which a student can work with a robot themselves.

According to a recent FANUC America study, 40 percent of students interested in automation discovered their passion for the field while still in high school.

The days of “shop” class may be antiquated, but there’s plenty of evidence that bringing a hands-on manufacturing course back into the curriculum can help spur interest in automation at a time when a student’s post-graduation path can be planned accordingly.

And that’s one of the really amazing things about a career in advanced manufacturing: Whether a student is seeking a four-year degree, a two-year degree or even a one-year certification, automation offers flexible solutions that lead to well-paying and in-demand roles.

To ensure that students have visibility and a hands-on opportunity to experience automation at work, we’ve spent years developing and rolling out a program that has brought more than 7,500 real-world robots and Computer Numerical Controls into over 1,700 classrooms at high schools, colleges and universities to offer certified education programs and industry-relevant training.

By working directly with the same robotic systems used in professional settings, students gain invaluable experience and earn industry-recognized certifications that open doors to exciting career opportunities.

## **Funding the future**

Another area in which we as an industry can do more is in the financial support of students pursuing an advanced manufacturing career path.

For many aspiring automation professionals, financial challenges pose a significant obstacle. FANUC’s study revealed that 58% of students rely on scholarships to fund their education, with 12% indicating that their ability to continue learning hinges on financial aid. Additionally, 38% of students work while attending school, while 22% depend on family support.

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Providing scholarships that directly address these needs and offer flexibility in education offerings are a critical step in promoting these opportunities to students that show potential in the field.

Whether automation companies choose to launch their own scholarship funds, partner with industry organizations, or simply further the continued education of their own employees, a commitment to supporting education is imperative.

Oftentimes, in this industry, we see individuals begin work in an entry-level shop role before taking on the increased responsibilities of operating a robot, then programming it, and eventually, being promoted to an automation management position. With the right financial assistance programming in place, we're able to nurture lifelong learning within the industry and keep great talent.

## **Building the Future Through Industry Collaboration**

Education alone cannot solve the talent shortage—industry needs to play an active role in preparing the next generation of automation professionals. To keep driving forward, we need to make industry-education partnerships an ongoing and strategic component of our efforts.

By uniting both academic institutions and manufacturing businesses in regions across the county, we can find unique ways to best reach local students and create impact close to home. The key, of course, is engaging one another in insightful, informative ways that create a win-win-win scenario for all parties, most notably, students and future professionals.

Our certified education program has made this an integral component to our process—facilitating these conversations and as a result, enhancing competency-based training and expanding certification opportunities into the most-needed markets in the U.S.

By joining forces, we're not just fueling innovation and growth—we're creating a steady stream of skilled professionals ready to take on the future of Industry 4.0. Investing in education, financial support, and mentorship isn't just about solving a problem; it's about shaping a thriving and sustainable future for advanced manufacturing.