A New U.S. Industrial Strategy to Maximize Manufacturing Workforce Talent

Kindle the Passion, Build the Pipeline, and Stay Ahead

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Last month, a new U.S. industrial strategy for competitiveness was introduced by Keith Nosbusch, Chairman and CEO of Rockwell Automation. It focuses on innovations to enable smarter, safer and more sustainable manufacturing in the future. These terms can also describe the 21st Century workforce in advanced manufacturing: people will be valued for their knowledge; they will be safer; and more highly educated workers will drive sustainability in both their enterprises and their career paths.

America enjoys a proud tradition of world leadership in the process of doing things better over time. Fueled by bright ideas and a strong value placed on education, productivity gains in agriculture and manufacturing have helped create a very high, durable standard of living. To rise to the challenge of a global manufacturing marketplace driven by productivity and flexibility, and the need to develop workers able to lead in such an environment, our industrial strategy must address three key attributes of workforce development:

- **Lifelong Learning:**
- **Competency-Based, Multi-Media Instruction; and**
- **Partnerships between Learning Centers and Manufacturers.**

To prepare workers for the technology-infused, high productivity workplaces of advanced manufacturing, Science, Technology, Engineering and Math (STEM) skills must be a key focus of our nation’s educational system. Employers must invest in job-specific, sustainable training programs to ensure workers can continue to advance with the evolution of new business processes. And, the investment of taxpayer-dollars in workforce development through the Workforce Investment Act and other federal programs must be focused on training to manufacturing skills in demand.

Educational pathways in secondary and post-secondary schools must be aligned to the competencies and skills required in the workplace, using tools like the National Association of Manufacturers (NAM)-endorsed Manufacturing Skills Certification System, resulting in credentials with real value in the workplace. Technology must infuse education as it has the workplace, and job training programs must continually evolve to accommodate emerging needs, such as the need for more workers with Certified Energy Manager credentials.

Finally, more collaboration and partnerships between manufacturers and our educational institutions are critical to the success of both workers and manufacturers nationwide. However, building a smart, safe, sustainable workforce is everyone’s responsibility. The stakes are so high that nothing but a coordinated effort will suffice.

Rockwell Automation has a long history of providing technology enabling U.S. Manufacturing productivity and sustainability. The Manufacturing Institute provides the solutions and services most critical to the American manufacturing workforce. Together, we propose the following ways to develop this competitive workforce.

Sincerely,

**Blake Moret**  
Vice President  
Rockwell Automation

**Emily Stover DeRocco**  
President  
The Manufacturing Institute
A smart, safe and sustainable manufacturing sector relies on the knowledge, skills and innovation of its workforce. A cohesive workforce development plan is essential to an effective U.S. industrial strategy for competitiveness that will advance the economic recovery and strengthen our nation.

The manufacturing workforce is crucial to our economy, a fact made clear in President Obama’s recent “Framework for Revitalizing American Manufacturing.” It states, “America’s manufacturers are at the heart of our country’s economy, providing good-paying jobs for millions of American families. The U.S. manufacturing sector is today the world’s largest; indeed, by itself it would represent the ninth largest economy in the world.”

Three components are vital to successful workforce training as part of a new industrial strategy:

• Attract students early, feed their interest in manufacturing and benefit their professional careers.
• Take a broad view of manufacturing workforce development and accommodate diverse learning styles.
• Encourage close cooperation between industry and academia to keep focused on results.

Technology Equalizes the Workforce, Sustains Jobs and Strengthens Manufacturing

It’s getting harder to tell the workers from the managers in today’s plants. Production workers, engineers, and managers all spend a significant part of their working hours using advanced technology to configure, control, and monitor processes. In addition to technology used for very specific applications, “general purpose technologies” such as intelligently controlled electric motors and data communication networks are now an indispensable part of smart manufacturing plants.

Productivity increases enabled by technology and a more educated workforce will sustain these advanced manufacturing jobs. As productivity rises, each worker produces more output and becomes more competitive in our global economy. Higher manufacturing productivity, enabled by technology, generates greater profits to increase American wealth. It leads to higher real wages and sustains these advanced manufacturing jobs while lowering consumer prices for manufactured goods. This also insures that the manufacturing core remains strong, providing the technology and investment foundation for jobs in many other economic sectors.

To realize the full potential of the manufacturing workforce and create advanced, sustainable jobs that attract students on a long-term career path, we need a U.S. Manufacturing Talent Strategy that focuses on three initiatives:

1: Lifelong Learning

The best trained workers are provided continuous learning opportunities throughout their adult lives. Because of advancing technologies, evolving company processes, and increasing knowledge requirements for factory jobs today, modern manufacturers often place a premium on mature, reliable, longer-term employees, and favor a more highly-trained and educated labor force.

But the opportunity to cultivate people talented in the science of making things starts early. With Lego MINDSTORMS®, young people create systems that contain most elements of an automated production line. Sensors, actuators, power supplies, design and
data-logging software; they’re all there. In high school, FIRST® inspires student interests in science, technology, engineering and math (STEM) by building and competing with a robot of their own design. Programs such as the Race-To-The-Top federal grant initiative should be used to strengthen STEM education as part of required school curriculum.

As students progress from high school to post-secondary education, multiple pathways can contribute to successful jobs at companies that build products. Four-year universities have a critical role in preparing a competitive manufacturing workforce, and community colleges play an increasingly important role, aligning their curricula to the skills that manufacturers need. Postsecondary credentials matter in the manufacturing workforce, and we have to create a system that encourages enrollment in college, takes full advantage of technology-driven instruction, and provides more “on and off” ramps to higher education.

Manufacturers must incorporate the need for lifelong learning into their business plan, right down to utilization targets for direct labor and provision for initial on-the-job education for new hires. The 2005 Skills Gap Report of The Manufacturing Institute, in partnership with Deloitte Consulting, calls for employers to invest at least 3 percent of payroll to provide training.

During the recession, many companies accelerated the trend to highly customized, role-specific training, as an alternative to laying off capable, yet underutilized, workers. The American Recovery and Reinvestment Act (ARRA) doubles funding for the public workforce system. However, we must improve industry awareness of how best to access these resources. We need to ensure federally-funded job training programs target industry-needed skills and competencies, while strengthening performance metrics in areas such as worker retention, with funds to reward educational institutions that produce manufacturing talent.

"It is important that education institutions work with industry vendors and training providers like Rockwell Automation, to ensure current and rigorous training," says Robert Clancey, Director of the Corporate College at Polk State College in Florida. Technology suppliers can also augment manufacturers’ workforces by providing contingent labor in the form of design assistance and modeling, commissioning support, remote technical support, and maintenance. This contingent workforce allows both the manufacturer and the technology supplier to concentrate on durable jobs in their respective areas of expertise and to avoid the need to shed non-core jobs during downturns.

2: Competency-Based, Multi-Media Instruction

Training a workforce for the smart factories of the future is difficult, and most businesses express concern about the ability of their people to meet these demands, especially as many experienced workers are reaching retirement age.

The NAM -endorsed Manufacturing Skills Certification System provides a framework of stackable, industry-recognized credentials to describe the breadth of skills necessary to succeed in entry-level jobs in today’s manufacturing
workplace and to create a competency-based education system. The first release of this Skills Certification System focuses on core or foundational skills necessary in any production environment. The Manufacturing Institute is now building the next tier of higher-level skills credentials. Integrating nationally portable, industry-recognized skills credentials into high school and college programs of study is a striking new approach to workforce development.

Training standards also are under development to address emerging concerns such as energy efficiency and environmental sustainability. About one-third of America’s energy usage is concentrated in industrial processes; demand is increasing for employees trained in identifying ways to deliver operational and environmental savings through reductions in energy use. The U.S. Council for Energy-Efficient Manufacturing (U.S. CEEM) is a voluntary partnership between industry, government, and other organizations focused on improving energy efficiency and reducing greenhouse gas emissions through the development of standardized assessment, management, and certification techniques. Systems that aim to standardize performance expectations must also include a variety of training delivery techniques to maximize effectiveness. As Mercedes Fisher Ph. D., Associate Dean of Academic Services, Milwaukee Area Technical College (MATC) says, “The workforce needs to be problem-solvers, creative thinkers, and self-directed learners to be successful. Techniques such as: cooperative learning, simulations, instructional and tool software, field experiences, demonstrations, guest speakers, videos of real-life manufacturing situations, hands-on projects and class discussions can provide workers with opportunities to reflect on practical experiences and apply the theories being studied in ways that change their perspective on the workplace and productivity.”

3: Partnerships between Learning Centers and Manufacturers

Broader and more sustainable links must be forged between educational institutions and businesses to ensure the alignment between a wide variety of sources of learning, including community colleges, universities, and industry-sponsored continuing education programs. Industry and educators need more formal and frequent communications to refine curricula to meet current and emerging needs.

Dr. Bill Wepfer, Chair of the George W. Woodruff School of Mechanical Engineering at the Georgia Institute of Technology, emphasizes that current technology must be taught. “We need to continue to provide strong underpinning engineering principles while also providing students with the opportunity to connect with the physical world and current technology. This is why many universities are strengthening their high-value-add ‘design-build’ activities in the design spines of the curriculum.”

Industry associations and technology providers can also provide valuable input to this dialogue. Ron Bullock, CEO of Bison Gear and Engineering Corporation and a member of the President’s Economic Recovery Advisory Board, stresses the importance to workforce development of an integrated educational system.

“Employers and the public sector must join forces to ensure an educated and skilled workforce for manufacturing in America. Manufacturers are deploying the NAM-Endorsed Manufacturing Skills Certification System and investing in their workers’ training. The public sector must now collaborate with us to align investment in workforce training to produce the best opportunities for first jobs and ongoing careers in manufacturing. Effective public/private partnerships will help us create the industrial athlete of the future.”
America Needs...

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Government has a major role in rewarding individuals and businesses that invest in education.

The AMERICA Works Act (HR4072) would give priority to “programs that provide a national, industry-recognized and portable credential.” It would amend existing education and job training programs such as the Workforce Investment Act, the Trade Adjustment Assistance Act, and the Carl D. Perkins Career and Technical Education Act.

The National Manufacturing Strategy Act of 2010 (HR4692) calls for a strategy that increases collaboration among government, labor, industry and academia, consolidates workforce development programs to improve the viability of best practices, ensures continued ties between training and results, and accommodates emerging needs.

Your Call to Action

What can we do to provide the educational and training infrastructure American manufacturing needs to compete successfully in the global economy? Here are a couple of immediate actions:

As a legislator:
- Your support of HR4072, the AMERICA Works Act, will give priority to programs of study resulting in nationally portable, industry-recognized skills credentials.
- STEM weighting in Race-to-the-Top grant application reviews will build the pipeline of technical workforce talent.
- Re-authorization and re-tooling of the Workforce Investment Act (WIA) should be focused on investments in job training for skills in demand.

As a business leader:
- Make your budgets for job-specific, sustainable training programs a priority.
- Learn about the National Association of Manufacturers-endorsed Skills Certification System.
- Get to know the four-year and community colleges that provide many of your workers – they need your input.

Building a smart, safe, sustainable workforce is everyone’s responsibility.

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See the full story inside...