

Dr. Peterson

National Competitiveness Forum: Deriving Value from our Investments in People and Ideas

3:45 p.m. Wednesday, Oct. 30, 2013, Newseum

Manufacturing Q&As

provided by Tracy Heath, Communications Manager for the Georgia Tech Manufacturing Institute

Q: How do we ensure that in the manufacturing sector we have a matchup between skills and opportunities in the marketplace?

A: At Georgia Tech, we approach this a couple of different ways. First, our research laboratories provide hands-on experience for students to work one-on-one with industry partners on real-world problems. Students can fully understand from lab concept to mass production and distribution the newest technologies being used in manufacturing, as well as the products being produced. There is no better way to develop the workforce of the future than to have that workforce developing and enhancing the manufacturing processes and technologies that will be prevalent in the factories of the 21st Century.

Also, the Georgia Tech Manufacturing Institute has developed a unique partnership with the Technical College System of Georgia. This year, the two organizations formed the TCSG-GTMI Manufacturing Competiveness Committee. The committee met bi-weekly throughout the year to identify possible collaboration opportunities for improving Georgia's manufacturing skills. In May, the group held a workshop that resulted in nine realistic and long-term potential projects. Those projects included new certificate programs, internships, new curricula, and continuing education for faculty. The first pilot program kicked off this fall, and it is an internship collaboration between the West Georgia Technical College and GTMI. The goal is to roll this program out statewide to TCSG's 25 technical colleges and 31 satellite campuses around the state.

GTMI is also using this program to build relationships with Georgia's world renowned

QuickStart. QuickStart has been named the top workforce development program in the country by a numerous publications, and it is operated by the Technical College System. Quickstart provides free, customized training for new and expanding manufacturers in Georgia. Classes are sometimes set up within the manufacturer's facility or in a technical college classroom.

Q: The administration has placed a focus on manufacturing. It once was the way for low skills and good wages. Now, the required skills are higher, and there are fewer jobs than before. Should we focus on it if not as many jobs will be available?

A: Yes, we should absolutely focus on manufacturing for several reasons. First, manufacturing is critical to the United States' economy. It makes up 70 percent of U.S exports, including everything from automobiles to medical devices. More than two-thirds of US scientists and engineers work in manufacturing, and 90 percent of all patents come from manufacturing. And, because the skill level that is required, manufacturing wages on average are higher than many other types of occupations. If we lost manufacturing, it would have a devastating impact on our economy.

Also, in terms of jobs, manufacturing does not only create jobs at the plant itself. For every manufacturing job created, other jobs are created in the supply chain and additional jobs in the broader economy. And for each \$1 invested in manufacturing, another \$2.48 in additional economic activity is generated. In fact, manufacturing has one of the greatest multiplier effects of any industry sector.

It is important for a community, state, region or nation to maintain a diversified tax base to survive economic ups and downs. When a location is too dependent on one industry or one business, then that location will suffer if there is a change that eliminates that industry from its tax base or otherwise drastically changes it to the point of layoffs. Take Georgia for example. In the 1990s and early 2000s people moved to the state in droves, creating some of the fastest-growing counties in the nation. Construction was

boon to Georgia's job market. However, when the housing bubble burst, so did Georgia's economy, and we have struggled more than many states in recovering from the recession because of that dependency on fewer industries. Recent wins in manufacturing locations, such as KIA's expansion, Baxter and Caterpillar, along with Georgia's increasing port activity, which is also heavily tied to manufacturing, has helped the state stay afloat economically speaking. Industry diversification is absolutely necessary to survive from an economic standpoint, and with manufacturing's multiplier effect, it needs to be a part of that mix.

Q: How will energy impact manufacturing?

A: Energy costs have always played a large part in manufacturing. It is part of the reason the United States was a leader in the sector for many, many years. Our costs are one-third of the energy costs manufacturers experience in Europe and one-fourth of the costs of energy in Japan, for example.

We have a huge advantage over other countries as well in terms of our availability of shale gas. It burns cleaner and offers a viable alternative energy source, creating a lower cost and more sustainable energy mix. According to a 2011 PriceWaterhouseCoopers report, robust shale gas development through 2025 would benefit the US manufacturing sector and the broader US economy by:

- Reducing natural gas expenses for US manufacturers by as much as \$11.6 billion annually
- Driving demand for certain manufactured products, as reported by 17 chemical, metal and industrial manufacturers in 2011 SEC filings
- Increasing manufacturing jobs, resulting in 1 million more workers employed by 2025 due to the benefits of affordable energy and demand for produced used to extract the gas.

According to an October 2013 Washington Post story, the natural gas boom will raise US GDP by about \$70 billion each year over the next several decades.

The challenge of shale gas and oils, however, is the environmental impact of extracting it. But there is a balancing act at play or a tradeoff, if you will, with shale gas and oils versus other energy sources. Natural gas has helped displace coal-fired power plants, and significantly reduced carbon dioxide emissions. Burning natural gas for electricity produces about half the carbon dioxide of burning coal. The Washington Post also reported on a Stanford study that shows natural gas is expected to displace coal, nuclear and renewable energy between now and 2035.

By replacing coal, shale gas and oil also removes other types of harmful air pollution such as sulfur dioxide and nitrogen dioxide, which are expected to drop considerably as shale gas becomes more plentiful. The Stanford study noted that cleaner air will make the country richer by improving health and extending lives, “Average emission damages decline by \$1 billion each year for sulfur dioxide and by a \$0.25 billion each year for nitrogen oxide.”

Q: The cultural aspect: How do we get young people to consider careers in manufacturing?

A: The Georgia Tech Manufacturing Institute is working with the Society of Manufacturing Engineers to capture the potential work force at an early stage. SME has many programs and initiatives targeting k-12 students as a way to replenish the talent pool of engineers in the United States.

Also there are national initiatives that we sponsor each year, including the national Manufacturing Day. Manufacturing Day is designed to empower manufacturers to come together and address their collective challenges and help their communities and future generations thrive. Manufacturing Day is made up of manufacturers across the country opening their doors to parents and children to show how manufacturing has changed and why it is such a viable occupation for their child. Manufacturing Day took place in Oct. 4 this year. More than 800 manufacturers hosted events and thousands of students and other visitors got first hand exposure to the new and improved world of

manufacturing.

On a more local level, many states, like Georgia, have made great strides in introducing young people to manufacturing. The Georgia Department of Education recently launched the Georgia Career Clusters/Pathways Programs of Study that allows students to choose an area of interest in high school from 17 clusters. Students take classes tailored to their cluster, which helps them navigate their way to greater success – no matter what they choose to do after high school graduation. Each cluster includes multiple career pathways. One of those clusters is manufacturing. The aim of the program is to show students the relevance of what they're learning in the classroom, whether they want to attend a two-year college, a four-year university or go straight into the world of work. Students will begin to learn about potential careers in elementary and middle school so that they are ready to choose a pathway once they reach high school.