

Editorial: Engineering innovation

There's a national debate on whether the shortage is real. But there is no debate locally for an economy that still depends heavily on manufacturing.

From the Journal Sentinel

Posted: Nov. 10, 2007

They are the invisible heroes in business, the men and women who make innovation possible.

They are people like Mary Ann Wright at Johnson Controls in Milwaukee, the former chief engineer for the Ford Escape hybrid who is leading a team bent on establishing world leadership in hybrid battery systems.

Or Werner Zobel, a Modine Manufacturing engineer working in Germany who hatched the idea for a new cooling system that the Racine-based company believes could be revolutionary. The system uses ultra-thin layers of aluminum to dissipate heat, a breakthrough that has potential for car and truck radiators and air conditioning condensers.

Intellectual candlepower will fire the regional economy, the Milwaukee 7 regional economic development group believes. Its strategic plan relies on innovation-driven manufacturers that are heavy with engineers.

But across the region, those companies say they can't recruit enough engineers, and they worry that shortages will worsen as baby boomers retire. Complicating the picture is a shortage of visas for foreign-born engineers and increased competition from rapidly developing economies in China and India for those students even when they complete their studies in the United States.

The University of Wisconsin-Milwaukee, Marquette University and the Milwaukee School of Engineering are racing to fill the pipeline. Marquette and UWM are promising expansive new buildings and increased enrollment of both undergraduate and graduate students.

But both schools will need a hand to reach those goals.

In Marquette's case, it's mostly cash that is required. The school has raised about \$45 million of the \$100 million it needs to build its ambitious new Discovery Learning Complex on W. Wisconsin Ave.

UWM needs both money and a key vote of confidence from the Milwaukee County Board to make its new \$149 million innovation campus on the County Grounds a reality.

Other steps are needed as well. The federal government should increase the number of visas available for international students who get job offers from U.S. companies. Businesses should boost support for Project Lead the Way, which promotes engineering among middle and high school students, and look for other ways to sell science and math to kids. And both businesses and universities should do a better job of recruiting women and students of color to be engineers.

While there is a dispute nationally over whether there is a shortage of engineers, State of Wisconsin figures predict double-digit growth in the profession over the next few years. Federal statistics show rising salaries.

Dave Rayburn, chief executive at Modine and himself an engineer, says companies are so hungry for talent that Modine has occasionally been shut out of career fairs. It's no coincidence that Frank P. Incropera, former dean of engineering at the University of Notre Dame, sits on Modine's board.

"The best of what is coming out now are very talented," Rayburn says. "They are very well-prepared in terms of hitting the ground. We just need more of them."

The number of students enrolled in engineering has declined in recent years at both UWM and UW-Madison, although the number of graduates has remained relatively constant. Marquette and MSOE report gains.

Job openings requiring expertise in science, technology, engineering and mathematics were expected to increase by 18.3% through 2014 in the state, compared with 11.5% for all other occupations, according to a February report by the Center on Education and Work at UW-Madison. Yet only 21% of the degrees awarded by the UW System and technical colleges focused on the fast-growing science, technology and engineering fields, the report states.

And M-7 data shows that the Milwaukee region has a smaller share of engineers, computer technicians and scientists than other faster-growing regions like the Twin Cities and Charlotte, N.C.

UWM, Marquette and MSOE are moving in the right direction. MSOE, in particular, has long been adept at linking up with companies to both help them solve problems and supply them with new talent.

"We have a number of students, undergraduates primarily, under the tutelage of staff or faculty who deal with the technology and directly with the companies," says Tom Bray, dean of applied research at MSOE. "I can tell you the number of companies coming on campus is at an all-time record."

Marquette's new school will focus on multidisciplinary learning and teamwork. The aim is to produce what Vivek Wadhwa, a professor at Duke University, has called "dynamic engineers," leaders capable of fostering innovation across international borders.

MU engineering Dean Stan Jaskolski argues that knowledge workers are the key to America's lead in innovation. "That's a major driving force, to continue to sow the seeds of innovation, and clearly, that requires manpower."

UWM has made the same argument, and it's a convincing one. The school is in negotiations with Milwaukee County to buy land at the County Grounds and with its donors to raise the money to pay for it. The County Board should move quickly to cut a fair deal for both sides and ensure that this important project doesn't stall.

Milwaukee's future innovators should be educated here and encouraged to remain in the region after graduation. Stronger programs at all three engineering schools are the key.