

Colleges, firms connect on skills for engineering

High-skill jobs such as optics and engineering have been on the rise

By NATE DOUGHERTY

As the area's market for engineering graduates with leading-edge skills grows, local colleges are working with employers to tailor programs meeting those needs.

While the overall number of manufacturing jobs in the region has dropped in recent years, the jobs leaving were mainly low-skill and labor-intensive. The number of jobs requiring a higher level of skill in areas such as optics and electronic engineering has been rising, noted Janet Glocker, vice president for academic services at Monroe Community College.

"As companies meet worldwide demand to have more value added in manufacturing of products, they want our curricula to be constantly upskilled, constantly reflecting knowledge of teamwork," Glocker said.

At Rochester Institute of Technology, this takes the shape of programs encouraging more women to enter the field. The Women in Engineering Program at RIT, known as WE@RIT, gives girls in grades four through 12 the chance to engage in hands-on engineering activities and meet women in the field who can serve as role models.

The Everyday Engineering Summer Camp, which ran July 9 through 18, gave these girls a chance to see how engineering affects people in their everyday lives. At the camp, girls split into age groups led by an RIT engineering student and an education student from SUNY College at Geneseo, with girls in 11th and 12th grade taking on classroom leadership roles.

In one session they learned about how bioengineering affects humans by studying a heart pump. In another session they studied how solar ovens could help address energy conservation issues, especially in developing countries.

Getting girls interested at a young age will help bridge the large gender gap in engineering and eventually bring the field the diversity it needs to address larger problems, said Margaret Bailey, endowed chairwoman and associate professor at RIT's Kate Gleason College of Engineering and executive director of the WE@RIT program. Local engineering companies want a more diverse talent pool, she said.

"Some may ask what the big deal is if engineering is 14 percent women," Bailey said. "When we start talking about innovation and design solutions for a diverse population, it's a good idea to have a diverse group designing those solutions. When we're looking at sustainability or large-scale problems, we're trying hard to diversify the group solving those problems."

The program also organizes trips for girls to visit local engineering companies to hear first-hand what they want from students. Harris Corp.'s RF Communications holds sessions where participants can visit a local facility to see what it would be like to work there and go on mock interview sessions with the company.

"These programs are a good recruiting tool because we can get them interested in Harris and what we do earlier," said Sarah Rothhaar, human resources representative for college and co-op programs at Harris. "It helps us build a good relationship with the school and the program, so it's good

for us and it's good for them."

At MCC, both the engineering and engineering technology programs work with students to foster an enthusiasm for engineering and a sense of teamwork, a sought-after but long-ignored trait from engineering companies.

First-year students in the engineering science program—which sends graduates to four-year colleges to continue studies, as opposed to the engineering technology, which sends them directly to the work force—take part in robot-building competitions that develop team skills.

"When they're designing and building they have to work with one another, communicate and put up with each others personal vagaries," Glocker said. "The general portrayal of an engineer is not a very team-loving person, and yet our students have to do all of that on the team."

RIT hopes to get girls interested in engineering at a young age, to help bridge the large gender gap in the field.

By incorporating more design-build early in the curriculum for engineering science and technology, the program helps give students the enthusiasm to make it through the drudgery of memorizing formulas and making calculations. It also responds to the American Board of Engineering and Technology, the body that accredits technology programs, which said graduating students need more interpersonal skills.

"Before, engineering people thought those were soft skills they could pick up on the job, but they found out schools were graduating people who weren't thriving in their environment," said John Wadach, chairman of the engineering science and physics department at MCC.

"And by pushing design-build concepts later into the curriculum, it was like teaching Little League kids baseball by saying you can't play a game until you have all the fundamentals, so the first year you learn to throw, then you learn to hit, then you learn to field and the fourth year you can play the game."

MCC also uses interaction with local employers to shape the engineering technology program. Because students entering the work force are expected to have a wider range of knowledge and the ability to work in electronics, manufacturing and mechanical engineering, MCC is working with an advisory committee of local employers to shape a curriculum.

Local optics companies worked with MCC to establish an optics fabrication certificate, even helping select the courses. While the core classes for engineering students will remain the same, this level of input helps MCC students stay on the leading edge of the industry.

"It's difficult even for those in the industry to predict what will be needed two or three years out, and that makes running technical programs challenging," said Dianna Phillips, dean of technical education at MCC. "If our programs are to be viable and dynamic, we have to be close to industry so our curriculum can be nimble and responsive to those needs."