One on One: Betty Lauer, dean of Quinsigamond Community College's School of Business, Engineering and Technology

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Helping students tinker with robots brings Betty Lauer back to her roots in rural Kansas. Growing up, Ms. Lauer, dean of Quinsigamond Community College's School of Business, Engineering and Technology, had very few female role models to follow, but she did have a machinist father who showed her how to use power tools.

That experience jolted in Ms. Lauer a passion for engineering and science that propelled her through community college and, later, Harvard University. After a successful career in information technology, she joined QCC in September 2000 as a professor and discovered a new interest: robotics.

Using that emerging field, Ms. Lauer would create a pathway to fruitful STEM careers for a more diverse group of students. In 2002, she started a K-12 after-school robotics program in the Worcester public schools that has since jumped to other school systems across the state. Students design robots to compete in Vex Robotics competitions, where their projects must perform a series of challenges in a game. Last year, 600 city students, elementary through high school, participated in the program, but some years the number has reached twice that amount.

What inspired you to start one of the largest after-school programs for robotics in the state?

When I came to QCC, I became interested in the students — where they were coming from, what their backgrounds were. I started writing grants for a variety of things, but women in STEM was one of them. I started an after-school club in the Worcester public schools focused on STEM. We did summer programs like build your own computers and other things like that. The robotics thing started shortly after that. It was before robotics became big. This field looked so interesting. The beatify of robotics is that you get to take that one field and use it teach students electronics, mechanics and software. You get to teach them all these different STEM fields with one project.

You were also focused on bringing diversity — including more girls and young women — to this field, right?

Worcester is very diverse, and we want those populations to be a part of the STEM economy. The more diversity you have, the more products you will have built. Sometimes when you have just one demographic inventing, they see what they see, but they don't see what the rest of the diverse population might see, invent and need. One of my goals is to really get those students in STEM and not to exclude them from those great careers.

How does the program work?

We participate in Vex Robotics competitions. Competition is big way for students to get excited about something. Every year Vex establishes this game, played on a 12-feet-by-12-feet game field. It's a different game every year: If your robot does this task you get two points, or another task you get four points. At the start of the season, we pull all the teams together and do a big kickoff. They see the game for the first time, then they go back to their schools, coaches and after-school programs to start to think about what their robot can do and the strategy behind how they're going to gather points.

Where has the program gone since 2002?

We used to really focus on the Worcester public schools. Then five or six years ago, the Massachusetts Department of Higher Education asked us to kind of scale robotics throughout the state. We identified school districts that had students who might be interested in robotics and we started after-school robotics programs in those schools. We even got some industry partners, like Bristol Community College. They now do it Fall River and that whole Southeastern area. We've really grown robotics in Massachusetts.

What do you see from the students who participate in the program?

What's really exciting from the perspective of a teacher is seeing students willing to learn things just for the sake of the game. When you have an immediate need to learn something, like the speed of light for example, you're going to learn it, especially if it furthers your cause. I see students get really excited about this and spend a lot of time learning things that they need in order to move on in the project. In the long term, I see students come through the program and become successful outside of it. They say that this is the program that changed their view of what they thought they could be. We have seen lots of students go through the Worcester public schools, come to QCC for a couple years, then maybe go to WPI for a couple more, and go on to work in the STEM economy. That is huge. STEM fields pay so much more than your average job. There are 26 million STEM workers in the U.S., and the average pay of STEM workers is \$61,000.

Would some of these students have had that opportunity if not for the robotics program? According to the Worcester public schools, about 54 percent of the district's students are classified as economically disadvantaged.

No, I don't think so. Let's face it: for STEM careers, it's about exposure. There's a population of students in the district that don't have their own computers — don't have access to the technology to learn from. And so our goal is to get their hands on that technology so they can be exposed to it.

Can you share any success stories?

Recently I saw a student who used to be our QCC Robotics Club president come back and give a speech. She's working at Raytheon right now. She was a Worcester public schools robotics student. She's from Ecuador, and I think she became a citizen while in the after-school program. She came to QCC for three years after that, then went to WPI for three years. She ended up with a master's degree in robotics.

In a nod to the Marvel Comics franchise, QCC has dubbed you its "Greatest Avenger" and "Iron Woman" for your work with students in the after-school program. How do you feel about those titles?

I was very flattered to be called Worcester's Greatest Avenger. Because of my background and because I'm a minority in STEM fields, I really appreciate what STEM education can do and the opportunities it gives. I'm not really so different from the students in the Worcester public schools: I grew up in rural Kansas, and my dad was a machinist; we were lower-middle class. I really, probably more so than the average person, recognize what education can do for a person — how it changes lives. And I want all those students in Worcester to have those opportunities.

Compiled by correspondent Matthew Tota