Increasing Female and Male Retention by 50% in Biotech Manufacturing

Host: Donna Milgram, Executive Director, Institute for Women in Trades, Technology & Science

Presenter: Dr. John Henshaw, Dean of Workforce Development, Mount Wachusett Community College

Interview Transcript:

Donna: Hello and welcome to the ninth session of the *STEM Success for Women Telesummit.* My name is Donna Milgram, Executive Director of the Institute for Women in Trades, Technology and Science, and I'm so glad you could join me, 15 amazing speakers, and over 1200 educators for this online conference funded by the National Science Foundation.

Dr. John Henshaw

Our guest today is Dr. John Henshaw, Dean of Workforce Development at Mount Wachusett Community College at the Devens Massachusetts campus. He's also the project director for the U.S. Department of Labor-funded Massachusetts Advanced Manufacturing TechHire Collaborative, a consortium of four Massachusetts community colleges focused on providing young adults aged 17 to 29 with advanced skills required for local employment. All programming is developed to meet employer needs and to align with credit program content to provide career and educational pathways to participants.

Dr. Henshaw also assists with the recruitment and placement of participants, and has successfully incorporated women in technology best practices into these efforts. **His college's Introductory Biotech Manufacturing class went from only one female student at baseline to nine out of 13 the very next semester after a WomenTech Educators online training. A year later, the introductory course had 57% female students. Retention of both female and male students also increased from a baseline of 50% to 100%, again in one semester.** Welcome, John, and thank you for joining me for the *STEM Success for Women Telesummit.*

Dr. John Henshaw (John): Thank you, Donna.

Donna: I want to start out by asking you to talk a little bit about your community. I know your college is located in a very rural area.

John: Yes, which of course, being from Massachusetts, people would say, “how can it be rural when it's the size of a postage stamp?” But it is. Everything is just compressed here compared to, say, Wyoming or perhaps Australia or something. But anyway, we're located in north central Massachusetts. So, we're in-between the Berkshires out to the west and the 495 and 128 beltways to the east which represents the bulk of the population in the state. Our service area includes both small mill towns with long history of manufacturing throughout the history of Massachusetts, and a lot of rural communities, very small four or five, six-thousand people, and as well as the twin cities of Leominster and Fitchburg, which are adjacent to each other and they have a combined population of about 100-thousand people. So, that the population center of our service area. We also serve a lot of students from southern New Hampshire, which is pretty rural area, too.

Manufacturing has been a big part of the economy always. It has reduced over the years as some jobs have lost their way to other parts of the world, but processes have needed to become more efficient to be competitive. You've got to automate and do things like that. So, manufacturing is still a big part of the economy in terms of the revenue. The workforce is still strong but it's a changing skill set. This area is much less affluent than communities towards Boston, which is east of us, or Worcester area to the south. We do have diverse population that we're serving, and a lot of first-generation college in that demographic.

Donna: Is it very different for them to get a job in your community? Do they have to travel out?

John: I've found talking to colleagues across the country, community college students oftentimes like to stay close to home as a generalization. Many of them, of course, are happy to move onward and outward. Because we are in a compressed area, they may need to commute to get to higher paying jobs, but they can still generally not move. As we've seen the economy strengthen, wages have increased locally and there has been strong employment. Of course, the other issue related to having to travel or move for work is their connection to the community and the family. We have seen many of students be able to gain employment in their local area. Some of them, of course, have to commute a little bit but not necessarily move out of town.

Donna: I've found that's really important especially to female students. In our CalWomenTech Project, 50% of the female students that were surveyed across 10 colleges had children, and about half of them were single parents and so they don't want to leave their support network. So, being able to get a job in their rural community where they don't have to move is really important to them.

I know manufacturing is still a very male-dominated area, even Biotech Manufacturing, and I'm sure that everyone listening wants to learn how your college increased female enrollment. **Can you tell us what the biggest change was to the way that you did recruitment?**

John: Certainly, the Women in Technology online program that you delivered got us thinking because I came to education from a career where I was involved more with industry many years ago. And then when you get into the educational field, you realize, especially at a smaller institution community college, that you have to wear a lot of hats. You really need to strategize on how you're going to be successful taking all these different aspects that a college will have as you find students, as you educate them, and as you retain them and then see their successful leaving of the nest, if you will, on to jobs and further education.

I think probably the strongest component for us has been engaging with potential students, whether they're coming from a high school or maybe from the career center as a dislocated worker or somebody seeking employment, and even incumbent workers looking to improve their skills to improve their position, is the importance of seeing someone like themselves in the position.

We were very fortunate. We were able to hire somebody, Gretchen Ingvasen, a woman who has a strong background in manufacturing. Her career started in the lab as a chemist and she was working for different food companies, and then she was working in the automotive industry. And then she migrated into quality. She advanced her degree to a quality concentration in an industrial technology Master's program, and then she got all the certifications that are associated with working in quality, the black belts and American Society for Quality credentialing.

She decided that she was looking to give back. So when we had an opening available to bring her on board as a senior learning specialist, she embraced the idea. We were fortunate enough to get her to join us in academics and she's been a great role model to all of those that have come through. She can talk the talk about having gone through working in manufacturing, in support of manufacturing, and that whole focus of having a female role model has been the strongest thing, I would say. Of course, there've been others.

Donna: Sure. And so, let me just check. **Was the time that you had only one female student, was she on board at that point?**

John: She was new. We were really at the beginning stages of developing the program when she came on board. She was getting her feet under her and helping us develop the curriculum, and helping us do the outreach at that time.

Donna: And it was, I think, at that time that your team joined the training, so maybe you can talk about the multiple strategies that you implemented as a result of developing the recruitment plan. And of course, Gretchen was a part of the team along with others in the college.

I just want to mention to our listeners that the research shows that multiple touches are most effective from a marketing and outreach perspective. **I know that many of your strategies capitalized on the fact that you had a female role model such as Gretchen, who herself had that experience. Could you describe those for our listeners?**

John: Sure. Certainly prioritizing where we're seeking our students was important. We have lots of institutional data about our current students, and we have good relationships with our K-12 partners, and the Career Center, et cetera. It was evident that a good source of untapped student potential was in those students who had yet to declare a major. We have always struggled with trying to minimize the amount of changing students do in their programs because we want to optimize their time at the college and their credits, but we do have students who are not certain of their careers.

So we would get from the college the unenrolled, no program students and then we would reach out to them. We held some events. We also targeted some of the core STEM classes that are common to many different STEM degrees and focused on visiting those classes. So, Gretchen would go and speak to the students so they could kind of hear what it means to be involved. And the focus was primarily, at the outset, in support of our Biotechnology/Biomanufacturing degree program where we were creating a one-year certificate that would stack into that degree program that really focused on the quality systems. Quality being the process by which you do what you say and say what you do, and document everything, and the compliance with federal regulations as well as international and ISO certifications, and all the different areas that I'm sure your audience some are familiar with, and others less so, but it's so important to industries across all disciplines.

We just happened to have a degree in biotechnology and so we were looking to add to it this additional technical content. So Gretchen helped us create the Introduction to Quality and Metrology course, and that became a target for us to also recruit women into. We also looked to have it demonstrate how it is of value to students as a science elective in other pursuits because the measurement of things is something that happens everywhere. The use of measurement tools and the contextualized use of math, if you will, by having students take measurements, calculate and see that there are deviations and

that differences exist and kind of get comfortable with numbers. So that's probably off on a tangent there, you know, to get people engaged in the whole process of why you're doing something and where it is going to take you.

Donna: You were talking a bit about also how to make sure to retain them, but what you're describing is that Gretchen did a presentation to potential students who could enroll that were coming from core STEM classes of feeder classes.

Now, my recollection is that a really rich source that 10 out of the 14 female students came from, was a non-credit bridge program, Introductory Biotech Manufacturing. That's where you got 10 out of the 14 female students in this non-credit course. Do I remember that correctly from our presentation together at ATE, Advanced Technology Education Conference for the National Science Foundation? Talk a little bit about that.

John: Yeah. I always need to be brought back to focus. So thank you for that. I'm the Dean of Workforce Development. What we do here is we have programming that is meant for students coming from a variety of different backgrounds. Oftentimes, we'll deliver short-term trainings that will either upskill somebody for a job so that they can then get the job and then come back for more training and education going forward. Many of our students have the economic pressures of needing to get a paycheck or a better paycheck. A lot of our students are already working. Many of them have families similar to what you indicated.

So we deliver a variety of different training programs to try to engage students and to get their interests. We have a lot of students that may be in a poor paying job, for example, and they're like, “College is not for me”, so the bridge program was enabled through a different federal grant, through the tax grants that I'm sure many of your community college participants utilized over the years, to develop a bridge to get them introduced to the content that they would find of value in employment but also to pique their interest into pursuing a credit program.

Specifically, we had a Quality Systems Training and we would deliver that in a two-week, 40-hour content, so pretty intense, and that would provide an overview and get them really engaged in the role that quality plays in manufacturing. But part of the program also was to engage them into workplace success skills. Everybody talked about soft skills or whatever, you know, the things that you need to be successful in life, in work, in college as well.

One other area of that we delivered on campus and we also brought it to employees at local companies, employees who had gotten jobs and were good performers for the company but didn't have formal training in that. So that was another way we would deliver that. So we would deliver the non-credit training both on campus and then remotely.

Of course, we had to change the scheduling to work with work schedules as well, but both of those different venues brought us students into our credit programs, so it kind of bridged them into that credit course and then continued on in their pursuits of associate degree or a one-year certificate. Sometimes people would take the class and that would be it and they would go off to work. We run the gamut of outcomes but a good way to engage was to provide a college bridge, get people kind of focused on these fundamentals that they could use in the job, if they had one, or in the job that they were going to get, and then kind of pique their interest to do more and to get engaged and to be comfortable, to build

confidence. A big key about everything we do is that when you demonstrate something that people can relate to and they can show or understand that they've gained skills, that helps with the confidence-building. That's something else that we've found helps bridge them into college. So that was a big part, that whole pre-college bridge.

Other things that were successful were the constant going out and meeting people where they were, you know, a community-organization or through career fair/job fairs. We would host a career expo event and we'd try to bring employers in. That was another strategy. There's a lot out there.

One thing that I really need to stress, and everybody's probably aware of this already, it took me a while to figure it out, but when you come into a college situation and if you're grant-funded and you have a grant that's supposed to do all of these different things, you really need to have buy-in from your colleagues within the college who do those similar functions for the college overall. Like for admissions, we have a great admissions team and they're out there doing recruiting for the college credit programs. When we have a grant to try to bring students into our pre-college bridge, we can co-opt them, because people that are in education are there for a reason. They want to see people succeed. They want to be able to support them. So if we can work with them, we can leverage their efforts to help us with our recruitment. That's something that has taken some time but we've been successful more and more as we get the buy-in. That's for admissions. That's for advising. And that's for career development/career counseling as well. When we first started talking several years ago, we were focused on the biotechnology program, but we built that up and did get quite a bit of increased enrollment. We've translated that over to our manufacturing with a similar approach.

Donna: I think those are good points. I'm really glad that you raised it. And so, just for our listeners, when you participate in a WomenTech Educators Training, you participate as a school team with key stakeholders such as the Dean, which John is, as well as actual instructors in the course, and advisors, outreach. It depends upon your particular school. And you focus on just one career pathway because if you focus on six or seven, the strategies are going to be different for a group. You need different role models. The building block skills you might need for attention are going to be different from one career pathway to another.

Once you have success in one career pathway, then you can roll it out to other career pathways in STEM. That's really important. But there's something that you mentioned that I'd like to ask you to speak a little bit more about because I know other colleges, this is the hardest part for them, which is getting buy-in. **Could you share with our listeners maybe three things that you did that you think that have helped with getting buy-in from other key stakeholders?**

John: Sure. Obviously, it can come from two levels. Top down and bottom up. Bottom up being everybody but the top, essentially, the bottom, the middle, the upper tiers. When you understand what the Director of Admissions needs to do, how they are measured in their performance, or the Vice President of Admissions and Advising, regardless of the structure of the organization, and then you see the staff that works to fulfill that mission, you can kind of identify who it is that has a mission that fits what you're trying to do as well. That took me some time when I first came from the outside world into academics even though I spent plenty of time at college, but I hadn't been working for one. Then you kind of see, "Okay, we have similar goals and objectives. What is it going to take to show pathways to mutual success?" Ultimately that is getting students into programs so that they can succeed and move on.

So when we did join your programs, we reached out to advising, admissions. Of course, there is turnover in positions over time, but you get that first core group involved and you kind of learn how they operate on a regular basis. What are their challenges? What are the things that they keep coming up against when they try to do their outreach? What are the important groups that we have as an access and transition team that gets all the gear up and the different federal programs to support college ventures for underrepresented populations or whatever the demographic might be? They're trying to find pathways for the people they're working with, and if they don't understand what you're doing, they have a hard time convincing somebody else to join them.

So, you need to be clear and open, transparent with your colleagues to let them know, "This is what we're trying to do. These are the jobs. These are the outcomes. These are the advanced educational pathways that we are going to be sponsoring or working towards in our program." And then you won't be surprised to learn you'll get great buy-in. Now all of the sudden, you're in their Rolodex, if you will. Like, "Okay, we've gone to this program. I have this student that prefers to work with her hands", for example. "Okay, well this is the program for you." Or, she went into healthcare and found out that she didn't like blood. That happens, too. It's oftentimes just as important to find out what you don't want to do. But then how quickly can you find something you do? So, developing the relationships with the people that actually do the work is very important, recognizing that they have to answer to a hierarchy that has their mission in what they do-

Donna: And it sounds like you put them into a problem-solving position, and I think some of them were actually part of the team making the plan.

John: Yes. One of the other issues that we have is that we are a satellite campus out at Devens. Our main campus is about 20 miles away. So we were very fortunate to have an advisor who served this area keeping us on their radar. She was comfortable working with us, had some familiarity with us. So she was a very valuable member of the team, but we were also able to get some people to say, "Hey, this is how we can make our satellite campuses successful because they have a program that serves the industry locally, and there's nothing better than getting people to pathways to employment and prosperity." That was key. Having a multidimensional team. And then if you have somebody if questions come up, even if it's somebody on your team doesn't know, somebody on your team likely knows where to find that answer. Doing the collaborative thing, and it doesn't have to be meeting every week, but to keep touching base, and what's new, what's changed, what's your challenges, that dialogue is very helpful. So finding the right pathway or the wrong pathway for individuals so that they can get what they need or are best suited for.

Donna: So going back to the students who were actually in the Biomanufacturing training that were female, I understand that 75% were unemployed and 25% were underemployed. And there were also two of the women came from plant layoffs. You had some high school graduates with no career direction. **What kinds of jobs and what kinds of salaries were they able to get once they actually got the certificate?**

John: Yeah. As our economy has changed, we now have more people. That was true of that bridge program a few years ago. Now, where employment is much higher, a lot of the students that we're working with are more underemployed than unemployed because they're working at Dunkin' Donuts or something. I've got a few examples for you.

One is Marcy. She had a varied background of entry-level employment, wasn't presently working, and she had no college. She took that bridge program with the fundamental basics and the quality training and that helped her get an interview at a local employer. They didn't have a position that was a good fit for her at the time, but they liked her so much because she presented herself well and she's very friendly and outgoing, and she was also bilingual, which is important. They actually created an internship slot for her. She went to work for them as an intern and then they kind of found a place for her. After the three-month internship, she was brought on full-time and she's continued to move up in the company and is now in the quality department.

Another woman who was one of those that you referred to as having been laid-off, Rupal. She worked at Intel. Intel had a big plant over in Hudson that had been around since Digital Equipment Corporation, and they eliminated it because they made small wafers and so. She had a lot of experience there working in the semi-conductor, but the semi-conductor industry in the Northeast is much, much smaller than it was in its heyday as jobs have migrated away. Tina, who also worked with her, she had been separated earlier and she had taken one of our programs and she got Rupal engaged to take it as well.

She jumped right in and went right into the certificate program. Then she finished that one-year certificate and then she got hired by GE Healthcare, first as a temp working in the operations department. Oftentimes in the manufacturing industry, they want people to be in operations so you see how a company works and then migrate into the quality department. So that was how it worked for her because they then hired her full-time in document control, which is a part of quality assurance, and she's now in the quality control department. So she's continued to rise up in the company.

The third example I have is Jodi. She had worked in biopharm over the years but then she stepped away from employment, and came back to us. She was having trouble getting a job but she took our training, and not only the training but the support that we have. We upscaled her and got some more credentialing and then she was able to get a job at Bristol-Myers Squibb. Now she's working as a quality assurance associate.

As far as the wages go, there's certainly been a change of late. When we were in the heart of the recession, many of these entry-level jobs, they would pay 9, 10, 11 dollars an hour. That has certainly gone up from there. Right now, we're seeing entry-level wages creeping up towards 15, 16 dollars an hour in many manufacturing operations. And then we're seeing a three to five dollar increase per hour when they transition into the quality. So, they're getting up towards the 20, 25 even.

We're seeing now a lot of what we're doing is focusing on automation and robotics because we have a huge growth in that need. Now they're hiring people at $25 an hour. Of course, it varies with experience. Some people have gotten higher wages even if they had higher skills to come in and then get a little training. So there is a trajectory, and that's one thing that is important, to work with the employers because they don't always do a good job of describing the career pathways. They say, “This our job”, when it would really be beneficial for them to say, “This is the job where you could come in under this skill set. We will invest in you.” Companies really want to invest in their good employees because they bring great value, “And then you do this, and now you're up to here, and this is the commensurate increase in wages that goes with that. And then this could be the supervisory path or maybe you're going to go off and become an engineer, who knows what?”

In the economy where you have high employment, it's very competitive, so these employers need to bring their A game to let students or participants in training, whatever you want to call our folks, you know, “This is what it's going to be for you”, and it's been very positive.

So, wages are looking good and yet they always need more training and more skills. So the next step we're moving towards is trying to define apprenticeship opportunities and things like that where you can really see, “Here's the additional training you'll need and here's how you can get it to keep moving up the ladder”, and emphasizing the career pathway nature of the workplace.

Donna: So what I'm understanding is that students with a certificate and perhaps no strengths in this area, are maybe starting around 15, but then some students have more specialized skills prior where the certificate can start at 25, and you're looking and seeing robotics at 25. And so, you're helping a number of students that really were having a hard time getting a good job in your community be able to get on a career pathway and a trajectory where they will have a career and be able to stay with a company that will invest in them. Now, I know that your program not only increased female enrollment, you started to talk about this a little bit earlier and I just wanted to come back and revisit this before we close, which is your retention rate really shot up for both female and male students from 50% to 100%. **Can you just talk about some of your top retention strategies for our listeners?**

John: Sure. And everybody will know that you can't maintain 100% retention regardless, but that certainly was the case from that semester to the next. As your program builds, there's always going to be some attrition, but we have kept a very high retention rate. One of the outcomes is that people leave before they get their credential because they've got a job opportunity, which does not reflect well on a program's retention yet it achieves the goal of the education. That's something that's a system residual, if you will, but we all have to deal with that. It's first identifying the students that are well-suited to the program, so that kind of up-front, this is what we're doing. This is what you've indicated to us that you have this interest, and you have some experience. You're coming into this with some knowledge that it is of interest to you and that you can succeed in the program. So coming in the door, you're poised to succeed. Now, we have to make sure that we maintain your interest, show you the connection between what we're teaching you, what you are learning on our own externally, to how that relates to the career path you will embark on or continue on for the rest of your life.

Math is a big challenge. Many times, the students that are acing math are not coming here, to be frank. So that is a barrier and it's oftentimes phobia-based as much as people get it into their heads that they can't do it or they don't like to do math. But if you can then find a way to engage them so that they're actually using math, just like balancing their checkbook would be, but also taking a measurement using a tool that gets you a number and then having somebody else use that tool and looking at the difference between two different users of a device, as well as looking at the difference between parts and understanding tolerances and things like that. Engaging in that manner helps. So all of a sudden, average standard deviation, percents, and conversions become a little bit more real, less abstract. So that's been very good on the math side of it.

And then the communications. Asking students to do a little research and to do a little presentation, work in a team, collaborate with others, discuss, do dialogue within a group face-to-face or something like a hybrid class where you have an online component, online communications, and getting people to relate to each other helps them build. The cohort model has been very strong so much that you have this “we're-in-this-together” approach. It's not an “I'm-against-you mentality.” It's like, “We're going to get through this together so that we will succeed,” because you're not fighting for one job. You're

fighting for a job for everybody as a result of learning and growing. And you see that with the students. So that's very important in our retention to have them relate to what they're doing, how it's going to relate to their future, how to be successful and to build your confidence in the chosen field.

It's not just going to be this one thing. These are transferable skills. We're teaching you, say, plastics injection molding of biomedical devices, what the employer does, so we have this content that addresses those skills but they're transferable to other operations. The IT component of everything, computers, programming, it's ubiquitous. So, if you're teaching them some use of lateral logic for programmable controllers (PLCs), that may spark an interest in IT cyber security or whatever. Getting people excited about what they're learning and relating to how it's going to improve their life is really important.

Donna: You know, I heard several key nuggets that I just want to call out. And the first is that you really focus in the beginning of a course, helping boost the confidence of the students and it's reinforced for them that this is something they can do. We know that confidence is a predictor of success in STEM. So, that's really key right from the start. The other thing that I heard that was really important is that you're showing them how what they're learning relates to what they will need to do on the job, or, in the case of the math, also to their daily lives. And focus as much on their fear around math and overcoming that as the math itself. We just had a speaker on yesterday, Donna O. Johnson Mackey, the inventor of the Guaranteed 4.0 System, who said that actually when there's fear, there's chemicals that are released that are different than the chemicals when you're feeling confident, and it's actually a very important part of brain learning. So, that's something you're doing in that piece.

And then the last piece that I heard was that you really connect the students with each other as a learning community. We know that disproportionately female students really like to learn collaboratively and work in a team. But that also works very well for male students. So you create that community within the classrooms and also help them see the career pathway that will result in them being able to get a job that has really a future for them in your community. So, some really important retention strategies that I just wanted to call out for everybody. Now, last two questions. **Remembering back, what your biggest takeaway from the WomenTech Educators Training?**

John: Well, the nice thing about it is it gets you to focus and to think about the things that you need to do to be successful. So it's that framework that's provided. I think in terms of the recruitment strategies, showing somebody in the role that you're projecting the student to be is so critical. And we find that to be true not only for male/female but other ethnicities, other groups, whatever your demographic might be. People will relate to it more if they can learn from somebody that they can see, “Okay, that would be me perhaps after working here for some period of time.” Also if we can bring in some younger folks so that younger folks are talking to younger folks. That's a key feature we have seen in this 17 to 29 year old focus demographic. It’s so important that if a bunch of old guys like me come in there and tell you all this stuff, you can't keep their attention.

Getting the institutional buy-in is critical. The top-level people need to know what's going on, but it's the people that are actually doing the work, the faculty, if you can get faculty on board. I didn't emphasize that enough. They've got busy schedules but they want to see their students succeed. They are very important to the success as well. Female faculty, obviously, for females is a great correlation. I'm a guy here and I'm doing my best to try to show support, and it makes me think more of nurturing perhaps, or how can I put myself in their shoes. Empathy. That's a key thing.

So, buy-in and getting the team approach so that you're leveraging everybody in a collaborative environment and you're sharing success and sharing challenges really helps build the college camaraderie just as it does in the classroom with the students.

Donna: Great. Now, in closing, what is one piece of advice you would give other educators trying to increase the number of female students in their CTE and STEM courses? And especially those who are in rural communities like yourself.

John: So certainly the rural community is not in isolation, yet it does present a challenge. Students need to understand what there pathway is going to be. And they need a frank discussion because they may not have thought it through. So, it all depends on how far the jobs are, what kind of life they're looking to lead. We are rural but we are not far from more urban areas, so if it was a matter of having to make a choice of leaving an area to be successful or changing your career path to stay local, that's something that we really haven't had to address because you just have to drive a little farther, which is unfortunate but we are seeing jobs closer to home.

Regardless of where your students come from, having that full discussion, and this is something we're doing at the college as well, is the career development piece that needs to happen from day one so that they can see what they're getting into, that they're not just taking college courses because it's the thing you do after high school, but rather it leads to a career. If they can see themselves in that career, if they see what their trajectory is and understand, "Okay, here's your near-term, here's your long-term." It seems as though people aren't always ready to think about that, just the whirlwind of getting through where they were a week ago rather than projecting out to the future. Engaging with the students and demonstrating a role model that fits their projection for themselves in the future is very important.

As far as the rural student goes, I'm from a rural area. I spent years away. I moved across the nation. I came back to the same rural area where I'm from, and I think it's in their best interests to do similar things like that, but you can't always talk them into that. You just have to meet the people where they are and understand everybody has their own perspective. You need to share yours with them. You're not try to preach to them or convert them, if you will, but just open their eyes to what opportunities are out there and then let them get motivated to follow through on it.

Donna: Great. So now, it is time to take your questions, and one of the questions that I see is, ***"Are there any connections to local colleges like Worcester Polytechnic Institute (WPI) for continuing education?"***

John: Yes. We have a lot of colleges around here, both the state institutions and the private institutions. WPI loves to get transfers in as juniors. They generally are looking for a large cohort. That has to be one example that we worked with where they want a certain number of students. I've been in Workforce Development for a while so this may have changed, but when I was in academics, they wanted five transfers a year, so it is a challenge to go from a community college to a private engineering school. We have a pre-engineering degree, and we've seen some people transfer to engineering programs like WPI, but as far as a formal articulation with them, I don't believe we presently have one. We do have a mass transfer within the Commonwealth, so, like, the University of Massachusetts or Fitchburg State, Worcester State University. That's more formalized, but we have a lot of opportunity.

One of the other things that we're seeing too is because of the high calculus demand of engineering and then also on the flip-side the high need of people in technical skills, for every engineer depending on the industry you're in we're going to need six to eight technicians, we are now hearing from other schools, Northeastern University in Boston, University of Massachusetts in Lowell, that are developing new engineering technology degree tracks that will also be a great place for our students to transfer to.

Donna: Okay. Another question is, ***"Has there been any resistance that the female students have faced in the workplace?"***

John: If you go to a manufacturing company and you go to the quality department, you will see, generally speaking, that there is a higher percentage of women there than in other sectors of the operation. For example, one company that we went to had a lot of females in the quality department who had gotten there because they were good, accountable people that worked hard, were willing to learn, worked well with others, paid attention to detail and they were very successful. They hadn't even necessarily had a lot of formal training, but rather a lot of on-the-job training. They took our training and that kind of empowered them even further, even to the degree where now they were confident that they could reject their internal suppliers with their own people, where in the past they would say, "Oh, you know, they're our own people, you know. I don't know what to do." Now, it's like, "No, you've got to follow this standard." So, in the quality world, we certainly have seen not an issue with that. I can't speak for women but in term of general operations. It's a changing world. I'm not aware of that, but I don't want to say that it doesn't happen.

Donna: But I think what I'm hearing is that your students are very well qualified for these companies. **And so, in a way, it really provides them with a more level playing field because of how prepared they are. It that an accurate interpretation?**

John: Yeah. Yeah. Now we're moving into the automation world, and we're once again lucky. We have a female instructor in that and she's an engineer. So she's the one that keeps our systems going with the PLCs and the robot, and so she's another great role model. We were just fortunate to get her because she also had teaching experience as well in the high schools. So she is a role model. We go to companies and they recognize her value and her skills, and we're starting to see the numbers come up a little bit. We only had two of 15 females in our latest Automation Technician Training Program, so we might have to go back to Donna's class on that one. But we're going to work on boosting that up. We're getting interest now. I think you see more of that now with some of the clubs like automation, robotics, drones, and technology. What I'm seeing, at least with the high schools, is more involvement with women.

Donna: Our first speaker, Mark Evans, actually in Emerging Technologies, they have a big focus on robotics in their community in Atlanta. He's based in Atlanta. The students are coming out and making $70 an hour with just certificates in robotics. So, you and your team may want to listen, and our listeners, to the first interview that we did.

I want to thank you again, John, for your participation today and your excellent interview, and to all of our participants as well.

John: Thanks, Donna.