

How a Rural BioTech Manufacturing Program Grew from 1 Woman to 13 in One Year & Dramatically Increased Retention of ALL Students

Female Enrollment Grew to 69% and Retention of ALL Students went from 50% to 100% in BioTech Manufacturing After One Semester

SUMMARY

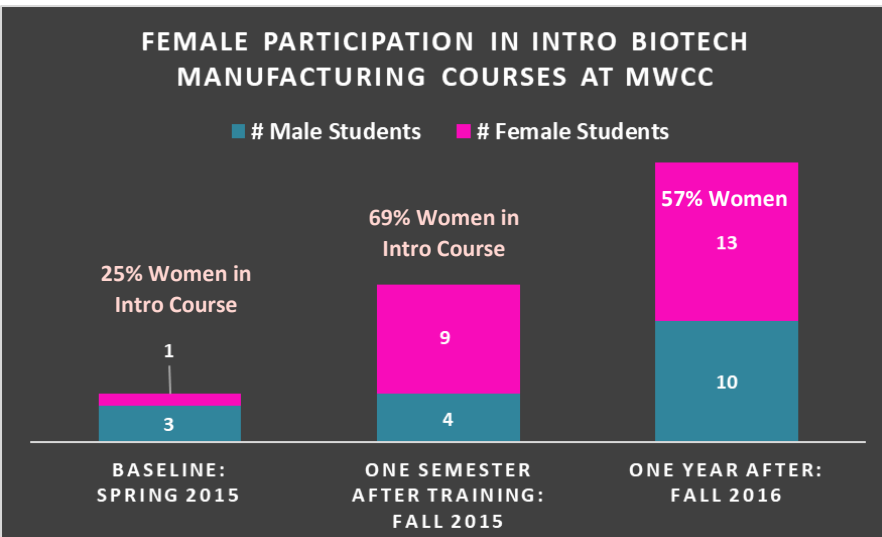
Mount Wachusett Community College’s (MWCC’s) Introductory Analytical Lab Quality Systems (BioTech Manufacturing) course went from only one female student to 9 out of 13—an impressive increase from **25% to 69% female enrollment**—the very next semester after participating in a WomenTech Educators Online Training. A year later, there were **13 women out of 23 students** in the introductory course—marking **57% female enrollment**. Retention of both female AND male students also increased from a baseline of **50% to 100%** in one semester. How did MWCC see this kind of success so quickly?



MOUNT WACHUSETT COMMUNITY COLLEGE
 Devens, Massachusetts (Rural Area)
 Certificate in Analytical Lab Quality Systems
 (BioTech Manufacturing)

RECRUITMENT & RETENTION RESULTS

- ☑ After 1 semester, female enrollment increased from **1 to 9 women** in a BioTech Manufacturing course
- ☑ After 1 semester, female AND male retention increased from **50% to 100%**
- ☑ 1 year later, female enrollment was 13 women



KEY ACTIVITIES:

- ☑ Presentation by a female role model instructor to a noncredit BioTech Manufacturing Course at MWCC: 70% of female students that enrolled in the Intro BioTech Manufacturing course came from this source
- ☑ Including female role models in recruitment activities and outreach materials
- ☑ Retention: Increasing confidence



“The WomenTech Educators Training was very eye-opening and it provided a vehicle and framework to focus our efforts. [...]

When our team first participated in the WomenTech Educators Training, we were focused on the BioTech Manufacturing program, but we built that up and **we’ve now translated the training to our other Manufacturing programs with a similar approach.”**

~ Dr. John Henshaw, Dean of Workforce Development at Mount Wachusett Community College and Project Director for Massachusetts Advanced Manufacturing TechHire Collaborative

CHALLENGES

Only one woman enrolled in MWCC's first Introductory BioTech Manufacturing course when the new certificate program started. Dr. John Henshaw, Dean of Workforce Development, saw an opportunity to get help with the challenge of enrolling female students in this new program when he found out about the WomenTech Educators Online Training held by the National Institute for Women in Trades, Technology & Science (IWITTS). John had a secondary goal of creating true institutional change by developing strategies to broaden sustainable female participation and applying those strategies to other STEM programs at the college.

ACTIONS THAT MADE THE DIFFERENCE FOR MOUNT WACHUSETT

- ☑ **WomenTech Educators Online Training**
- ☑ **Bringing a TEAM together**
- ☑ **Developing a Recruitment and Retention Plan**

MWCC participated in the WomenTech Educators Online Training hosted by IWITTS in September 2015 with several other colleges.

The WomenTech Training required MWCC to participate as a team, so that faculty and staff could collaborate, have input and buy-in for the WomenTech Recruitment and Retention Plan they would develop during the training.

According to John, “The WomenTech Educators Training **was very eye-opening and it provided a vehicle and framework to focus our efforts.** It gets you to think about what it takes to be successful. **The most valuable aspect of the training was building our team!** Getting a group of people focused and thinking about retention was a good thing. **Getting the institutional buy-in is critical. While top-level management needs to know what's going on, it's the faculty—the people actually doing the work—that you need to get on board.**”

John strongly encourages other educators to put together a WomenTech Leadership Team and to build college-wide support, so that success broadening female participation at the program level can easily turn into institutional change. As he says, “Getting buy-in and the team approach so that you're leveraging everybody in a collaborative environment and sharing successes and challenges, really helps build the college camaraderie just as it does in the classroom with the students.

One thing that I really need to stress: you need to have buy-in from your colleagues within the college who do those similar functions for the college overall. For example, we have a great admissions team and they're out there doing recruiting for the college credit programs, so when we have a grant to support recruitment, we can co-opt them. People that are in education are there for a reason.



“The nice thing about the WomenTech Educators Training is it gets you to focus and think about what it takes to be successful—it provides a framework.”

In terms of the recruitment strategies, showing somebody in the role that you're projecting the student to be in is so critical. This is true not only for male/female, but other ethnicities, other groups, whatever your demographic might be. People will relate to a career pathway more if they can learn from somebody that looks like themselves. They might say, ‘Okay, that could be me after working here for some time.’”

~ Dr. John Henshaw, Dean of Workforce Development at Mount Wachusett Community College and Project Director for Massachusetts Advanced Manufacturing TechHire Collaborative

INSTITUTIONAL SUPPORT: WOMEN IN TECHNOLOGY LEADERSHIP TEAM

Participating in teams ensures that all the key stakeholders are represented and invested. Here are the job titles of the 6 MWCC Leadership Team members:

- Key Leader = Dr. John Henshaw, Dean, Workforce Development
- Chair and Professor, BioTechnology Department
- Analytical Laboratory and Quality Systems Assistant Professor
- STEM Starter Academy Recruiter
- Senior Learning Specialist
- Career Development Coach

They want to see people succeed, and 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 their buy-in. **That's for admissions, that's for advising, that's for career development/career counseling as well."**

The successful efforts of the BioTech Manufacturing team are spreading, and John feels his teams' work is becoming "part of the culture" at MWCC. An advisor has adopted this same approach with MWCC's Advanced Manufacturing program as well and has also seen more females enroll in that program.

The semester-long WomenTech Educators Online Training combined 8 asynchronous modules with virtual real-time coaching by Donna Milgram—IWITTS's Executive Director. Each team met weekly to work on development of their WomenTech Recruitment and Retention Plans from templates and the Personal Encouragement and Welcoming Conversation talking points. Following the training, the team received 2, hour-long Plan Feedback Calls from Donna, and Coaching Support for Implementation. At 6 months, all the school teams presented their outcomes to each other.

RECRUITMENT STRATEGIES

- ☑ **Female Role Models in Outreach Materials and Strategies**
- ☑ **Presentation to MWCC Noncredit Feeder Course**
- ☑ **Personal Encouragement Conversation**

The Recruitment Plan MWCC developed during the WomenTech Training called for the team to develop a Women in Analytical Lab and Quality Systems (ALQS) Information Sheet that would provide a brief overview of the program and career pathways **along with photos showing at least 50% women in the ALQS workplace** (see Figures 1, 2, and 3 to see these outreach materials).

MWCC's Recruitment Plan also called for counselors, advisors and instructors to share stories of female role models in one-on-one Personal Encouragement Conversations with prospective students. The team wrote the script for these recruitment conversations based on a template from the WomenTech Training (see Figure 4).

MWCC was fortunate to have a female role model working as an instructor on their team. Gretchen Ingvason—a senior learning specialist at MWCC—came from a successful career in Manufacturing and was at a stage in her life where she wanted to give back.



"You need to be transparent with your colleagues, and 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.' You shouldn't be surprised to learn you'll get great buy-in."

Now all of the sudden, you're in their Rolodex, if you will, and they know they can turn to you. Imagine faculty being able to recognize, 'I have this student that prefers to work with her hands,' and help guide their path by suggesting 'This is a good program for you.'"

~ Dr. John Henshaw, Dean of Workforce Development at Mount Wachusett Community College and Project Director for Massachusetts Advanced Manufacturing TechHire Collaborative

QUALITY SYSTEMS TRAINING

OVERVIEW
The Quality Systems Training Program is a short-term intensive non-credit training course to prepare students for jobs in Quality Assurance and Quality Control, for a variety of manufacturing industries including biopharmaceutical processing, medical device manufacturing and others.

COURSE CONTENT

- Concepts in Quality
- Professional Framework
- Quality Systems
- Measurement/Inspection
- Quality Operations
- Validation
- Root Cause/CAPA
- Lean Six Sigma

CERTIFICATION

- Knowledge toward American Society for Quality (ASQ), Quality Improvement Associate (CQIA) or Quality Process Analyst (CQPA) Certification exams
- Aligns with MWCC Credit Coursework

CAREER OPPORTUNITIES
Students who successfully complete this training program will be prepared to seek positions requiring knowledge of regulated and international quality systems, continuous improvement techniques, and understanding of the tools used to have a positive impact on an employer's bottom line. **Quality Analyst; Quality Inspector; Regulatory Associate and Document Control Specialist**

FAQs

Am I a good fit for the Quality program?
A Career Development Coach will meet with you one-on-one to discuss your interests and skill levels to determine whether or not the training is a good fit for you.

What is the cost? The training is free to qualified individuals.

When will the next session begin? New classes begin every 8 weeks.

How long is the training? The training encompasses 40 hours in the classroom and is typically offered in a 2-week format scheduled as Monday-Thursday from 8:30am-2:00pm.

Do I need to take an admission test?
You will take the Work Keys Assessment, which is an adaptive assessment that will gauge your proficiency in reading, math and locating information.

I currently receive unemployment benefits. How will this affect the process?
You will want to speak with your Career Counselor to determine whether or not you are eligible for the Section 30/TOP program. Either way, you are still eligible to enroll in the training.

Contact Us
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mwcc.edu/manufacturing

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AAEEO Institution

This program is sponsored by a \$15.9 million grant from the U.S. Department of Labor, Employment and Training Administration. The AMMOC program is an Equal Opportunity program. Adaptive equipment is available upon request for individuals with disabilities.

Figure 1. Noncredit Program Course Sheet

She started her career in the lab as a chemist where she worked for different food companies, then moved over to the automotive industry, and eventually migrated into Quality. Along the way, she entered a master's program in Industrial Technology with a concentration in Quality and proceeded to obtain all the black belt certifications from the American Society for Quality.

Gretchen had done outreach for the first cohort for AQLS in a general way in the past, but now the Recruitment Plan called for her to target prospective female students via presentations and Personal Encouragement Conversations.

As John said, "I think the strongest recruitment tactic a school can use to engage potential students is having them see someone like themselves in a Manufacturing position. Whether they're coming from a high school or the career center as a dislocated worker or somebody seeking employment, they need to see female role models."

☑ Presentation to MWCC Noncredit Feeder Course

MWCC's Recruitment Plan identified the noncredit BioTech Manufacturing course as an important target audience for recruiting female students and it turned out to have the highest conversion rate. This intensive 2-week course included 40 hours of content and was provided on campus and, remotely, at local employers. It was designed as a feeder and bridge to the credit course. According to John, "The course focused on these fundamentals that they could use at their current or future job, and helped students build confidence and piqued their interest to do even more." Most importantly, **38% of the noncredit students were female (n=69)**.

Gretchen Ingvason, an instructor and female role model, presented to the noncredit courses and passed out brochures featuring female role models. She invited students to schedule one-on-one conversations (more females than males requested this) and used those conversations to personally encourage the women to enroll in the Introductory BioTech Manufacturing credit course. **Ten female students were recruited from the noncredit to the credit course.**

What were the characteristics of the students recruited into the noncredit course?

Noncredit BioTech Manufacturing Feeder Course Demographics:

- 38% female (n=69, unduplicated headcount)
- 75% were unemployed and 25% were underemployed
- Many dislocated workers, including plant layoffs (2 women from local plant layoffs)

EXPAND YOUR CAREER POSSIBILITIES
Quality Systems 2 Week Intensive Training Program

Are you looking for a new career? Or to increase your knowledge and move ahead in your current position?

Quality Assurance and Quality Control Not Just Manufacturing
The quality professional takes measurements, analyzes the data, and interprets the results. Measurements may be physical dimensions, or the amount of time it takes for a customer service representative to answer the phone.

Quality Professionals have opportunities in both service and manufacturing industries. Examples of service industry sectors include: healthcare (diagnostic labs, insurance companies), information services (publishing, archiving), Financial (mortgage companies, banks). Examples of manufacturing sectors include pharmaceutical, medical device, plastics, aerospace, and automotive.

Students will be provided general knowledge on: regulated and international quality systems, continuous improvement techniques, and an understanding of the tools used to have a positive impact on the organization's bottom line.

November 3rd – November 14th
4 hours per day, 4 days/week
8:30 AM – 12:30 PM
MWCC Devens
27 Jackson Rd. Devens, MA

Week	Topic
1	Concepts in Quality Professional Framework Quality Systems Measurement / Inspection
2	Quality Operations Validation Root Cause / CAPA Lean Six Sigma

Candidate Requirements
Prior Work Experience and/or College Credits

Contact Information
Registration and Info Session Information:
Meghan Koslowski: mkoslowski@mwcc.mass.edu
Christian Reifsteck: creifsteck@mwcc.mass.edu
978-630-9144
Additional Program Information:
Gretchen Ingvason: gingvason@mwcc.mass.edu
978-630-9576

Scholarships Available!

Figure 2. Flyer for Noncredit Bridge Program Course

QUALITY SYSTEMS TRAINING (QST)

OVERVIEW
The Quality Systems Training (QST) introduces the functions and processes required to be successful in the production of goods and delivery of services. This applies to employers working in regulated environments (e.g. FDA) and in compliance with industry certifications (e.g. ISO). Participants in the training learn how their current or future jobs participate in the Quality System of an organization. This intensive non-credit training course helps to prepare students for jobs in Quality Assurance and Quality Control, for a variety of manufacturing industries including biopharmaceutical processing, medical device manufacturing and others.

COURSE CONTENT (SEE REVERSE FOR DETAIL)

- Concepts in Quality
- Quality Systems
- Measurement / Inspection
- Lean Six Sigma

CERTIFICATION

- Aligns with American Society for Quality (ASQ), Quality Improvement Associate (CQIA) or Certified Six Sigma Yellow Belt (CSSYB) Certification exams.

CAREER OPPORTUNITIES
Students who successfully complete this training program will be prepared to advance in positions requiring knowledge of regulated and international quality systems, continuous improvement techniques, and understanding of the tools used to have a positive impact on an employer's bottom line.

FAQs
Who can benefit from the QST? The QST is designed to introduce Quality functions and processes to a wide range of professionals. For manufacturing companies, this begins with entry level production and support roles all the way through top level management. The QST will help production and Quality staff understand their role in ensuring Quality Objectives are met.
Supervisors, Managers, and Business Support personnel may especially benefit from modules 6-8, which is available as 15 hour QST-M.
What is the cost? Complete program - \$1650.00 includes course materials and assessments.
QST-M - \$660.00 Modules 6-8
Where/ When is the QST offered? The QST is offered at the MWCC Devens campus and can also be delivered as on-site training. The Devens schedule is set semiannually. Additional offerings can be scheduled based upon demand.
How long is the training? The full training encompasses 40-hours in the classroom and is typically offered in a 2-week format scheduled as Monday-Thursday from 8:30am-2:00pm.

For registration info:
978-630-9569

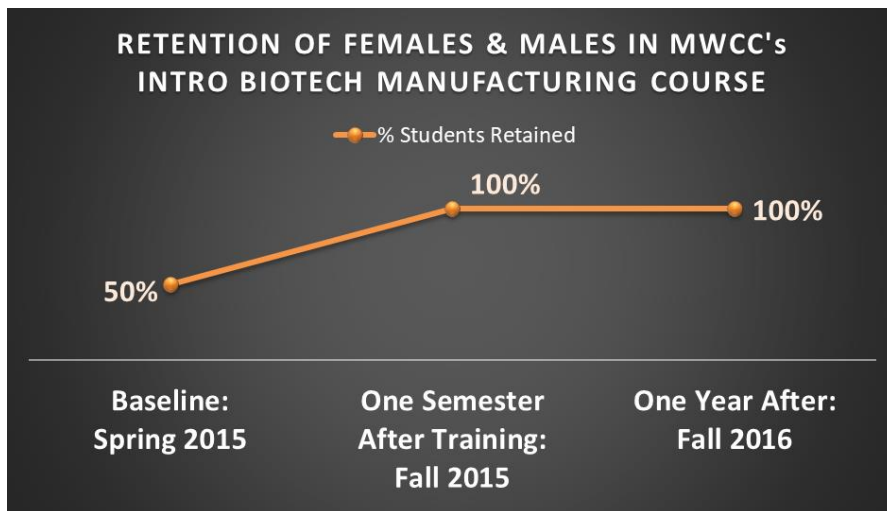
Figure 3. MWCC Noncredit Program Course Flyer

- Some high school graduates with no career direction
- Referrals from community-based organizations
- Referrals from Career Center (Workforce Development)

MWCC has continued to follow the successful practices for these noncredit Quality technician trainings and continues to see strong participation by women in these programs.

☑ Personal Encouragement Conversation

A survey of the female students enrolled in the Manufacturing Certificate Program found that the Personal Encouragement Conversation was a key factor in their decision to enroll. See Figure 4 for an excerpt of that conversation from MWCC's Recruitment Plan.



RETENTION

- ☑ Boosting Student Confidence in Their Ability to Learn Bio-Manufacturing
- ☑ Helping Students Overcome Their Fear of Math
- ☑ Collaboration and Teamwork

MWCC increased female and male retention from a baseline of 50% to 100% in the 2 subsequent Manufacturing Program cohorts. The team developed an 8-page Retention Plan in the WomenTech Training from a plan template. These were the top strategies:

- **Boosting student confidence in their ability to learn Bio-Manufacturing** from the beginning of the course and reinforcing that confidence as the course continues, so they know this is a career pathway they can succeed in. Since a high percentage of students in the Bio-Manufacturing Certificate came from the noncredit Quality feeder course many got a head start on confidence before their first day of class.

MWCC PERSONAL ENCOURAGEMENT CONVERSATION SCRIPT EXCERPT:

Female Student: That's a good starting salary, please tell me more.

You (Instructor/Counselor): Quality career professionals provide a variety of functions—anything from testing products and materials to validating procedures and processes to collecting and reporting results and much more. Employers need to comply with regulatory agencies such as the Food and Drug Administration, as well as certifying bodies whose standards must be followed. Quality is a really important role in a company—making sure systems are in place so products perform to industry standards. This can be a life or death matter in the case of the medical products industries.

Female Student: That sounds pretty interesting. I wonder if I would be able to do it?

You (Instructor/Counselor): Of course, you could! You've already taken science and math courses. I think if you have the motivation you can make this happen. This is a good field, and there are women working in it. Our instructor, Gretchen Ingvason, has worked for years in this field and chose to work for us at the Mount to help women gain access to this great career track. I know some women working in the field that we could refer you to—Would you like to speak with someone who has experience working in the field?

Female Student: Yeah, I'd definitely be interested in speaking with someone.

[...]

Figure 4. Excerpt from MWCC Team's Personal Encouragement Script

- **Helping students overcome their fear of math.** According to John, “Math is a big challenge, the students that are acing math are not coming here, but if you can find a way to engage them so that they’re actually using the math in a real-world context then all of a sudden, average standard deviation, percent, and conversions become a little bit more real, less abstract. For example, 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 2 different users of a device, as well as looking at the difference between parts and understanding tolerances. Engaging students in that manner helps.”
- **Collaboration and teamwork.** According to John, “Asking students to do research and a presentation, work in a team, collaborate with each other, dialogue within a group face-to-face and online, getting students to relate to each other helps with their retention. The cohort model has been very strong in producing a ‘we’re-in-this-together’ mentality among students. It’s not a competition mentality. They’re working together to succeed and helping each other as they learn and grow.”

STUDENT SUCCESS STORIES

John was able to share several student success stories:

- “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 with 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 also bilingual. They actually created an internship slot for her. After the 3-month internship, they found a place for her, 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—Rupal—had been laid-off by Intel when they closed a big plant that had made small wafers. Rupal had a lot of experience working in the semi-conductor industry but there were fewer jobs in that area as many had migrated away. A former co-worker of hers had enrolled in the Bio-tech Manufacturing Certificate program and she convinced Rupal to join her. Upon graduation she was hired by GE Healthcare, first as a temp working in the operations department, then full-time in document control—which is a part of Quality Assurance. She’s continued to rise up in the company. Often in the manufacturing industry they want a new employee to be in operations so they can see how a company works and then they migrate them into the quality department.



“Everybody knows that you can’t maintain 100% retention, but that was the case from that second cohort to the next.”

As your program builds, there’s inevitably going to be some attrition, but we have kept a very high retention rate.”

~ Dr. John Henshaw, Dean of Workforce Development at Mount Wachusett Community College and Project Director for Massachusetts Advanced Manufacturing TechHire Collaborative

“I really like being on the floor—touching the products and seeing what the issues are—that’s what I’m really passionate about.”

Betty Garcia
Manufacturing / Quality Engineer

CAREER QUICK LOOK

Years in Field: Less than 1 year as a Quality Engineer

City/State: North Andover, MA

LinkedIn: None

Video Clips: [Watch on YouTube](#)

Ethnicity: Latina

School: Mt. Wachusett Community College, Instituto Tecnológico de Santo Domingo, Dominican Republic

Degree: BS, Industrial Engineering; Master’s in Management

Career Pathway: Manufacturing

Personal Time: Time with family

How did you get interested in Manufacturing and what has your journey been like so far? What is your background?

I decided I wanted to be a Manufacturing Engineer at age 14. I participated in a 20-hour summer internship for a shoe manufacturer and I was in love. I knew then, “This is what I want!” It was fun because I spent a whole day at the factory, talked to the operators, saw what he was doing and knew I wanted to work in the Manufacturing Industry. So, that’s how I got started.

I’ve been really good with numbers since I was little. I love math and people always told me, “Oh, you should be an Engineer when you grow up because you’re good with numbers and that’s what Engineers do.” So, I had that in my mind. I considered Electronics and Civil Engineering, but I wasn’t really interested in those fields. Then I heard about Industrial Engineering. It was starting to be a popular profession back at the time in my home country of the Dominican Republic. So, I gave it a try and it was just the thing for me.

Back home, there are a lot of women that are engineers. It wasn’t equal—I would guess 60% men to 40% women—but it was still high compared to the U.S. So, I did not feel like I was the only woman doing it.

What is your educational background?

I received a BS in Industrial Engineering at a University in the Dominican Republic—on a full scholarship. When I came to the U.S. several years ago, I started with an English immersion program, took the TOEFL, and then completed a Master’s in Management. Earlier this year, I took a Lean Manufacturing Course at Mt. Wachusett’s Community College to prepare me for my new role as a Quality Engineer. The noncredit course was intensive—2 months, 4 days per week and 6.5 hours per day.

Figure 5. Role Model Profile of Betty Garcia, Quality Engineer and MWCC Quality Training Graduate
([Click to Access Program Graduate Profile](#))

- The third example is Jodi. She had worked in biopharma 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 utilized the Student Support Services we have available. MWCC's BioTech Certificate up-scaled her skills with more credentialing and as a result she was able to get a job at Bristol-Myers Squibb as a quality assurance associate."

RURAL AREAS: SPECIAL CONSIDERATIONS

According to John, **"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. We also serve a lot of students from southern New Hampshire, which is pretty rural area, too.

Students need to understand the career pathways they are considering, how far away the jobs are, what kind of life they're looking to lead, and here's your near-term, here's your long-term. From a career development standpoint, they need a frank discussion because they may not have thought it through. 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.

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 personally I think it's in the best interest of others to do the same, but I also know it's not for everyone. You just have to meet the people where they are and understand everybody has their own perspective. **At MWCC our job is to open their eyes as to what opportunities are out there and then let them decide which path to choose."**

SIDEBAR: LABOR MARKET

According to John, "As far as the wages go, we're seeing entry-level wages creeping up towards 15 or 16 dollars an hour in many Manufacturing operations. And then we're seeing a 3 to 5 dollar increase per hour when they transition into Quality to **\$20 to \$25 per hour**.

MWCC is now also focusing on Automation and Robotics because we have a huge growth in that need. Employers are hiring new employees at \$25 an hour.

Companies really want to invest in their good employees because they bring great value. There could be a supervisory path or maybe you're going to go off and become an engineer, both are possible."

ABOUT IWITTS: CREATOR OF WOMENTECH EDUCATORS TRAINING SYSTEM

The Institute for Women in Trades, Technology & Science has been helping educators nationwide close the gender gap for women and girls in technology since 1994. IWITTS provides tools, resources, and professional development for educators to help them broaden female participation in STEM and CTE programs where they are underrepresented.

To discuss what type of professional development would be the best fit for your school, region, or state please [Contact Us](#). Visit our website at: www.iwitts.org



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