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**Mike:** From the Center for Occupational Research and Development, welcome to ***Preparing Technicians for the Future of Work***. I'm your host Mike Lesiecki. In each podcast we'll reach out to people who are actually on the front line of the future of work and hear what they have to say. That means interviews with industry, interviews with working technicians, forward thinkers in the field. We'll do some background research, and we'll curate that research to make sure you have the most up to date and relevant information. And in every episode, we'll suggest action that you can take. We want to inspire you to take that action. This podcast is brought to you by the Center for Occupational Research and Development, known as *CORD*, with financial support by a grant from the National Science Foundation's Advanced Technological Education program. Opinions expressed in the podcast do not necessarily represent those of the National Science Foundation. You can find out more about our project and our approach at "[PreparingTechnicians.org](https://PreparingTechnicians.org)."

Our guest today is Jennifer Oddo. She's the Executive Director of the Division of Workforce Education and Innovation at Youngstown State University. And prior to that she had a stint at IBM. Welcome, Jennifer. Would you tell us a bit about your time at IBM and what you're doing today at the Center?

**Jennifer:** Yes! And thank you, Mike, for having us here today. We are very excited to talk about some of the important initiatives that are emerging in the industry. And, as you mentioned, I am currently the Executive Director at Youngstown State University's Workforce Education and Innovation division. And under a Division, I lead three pillars of work, one being the Excellence Training Centers, which are state-of-the-arts advanced manufacturing, robotics, automation, computer software training centers, as well as our workforce education offerings and workforce initiatives for the community.

And, as you had mentioned, I had spent a significant amount of time at IBM prior to coming to Youngstown State University. And really proud of the work that we did at IBM to really reinvent how we hire into these organizations.

So, back in 2016, IBM CEO Ginni Rometty had coined a new term called "new collar." New collar is about taking what has historically been a blue collar approach to what have historically been white collar jobs. And we created new collar jobs. And the first pillar of work around new collar was standing up IBM's competency-based IT apprenticeship program.

Many know apprenticeships in the trades and construction industry. And they've had a lot of success in those areas. But what many don't realize is that IBM, along with other companies like Amazon, Microsoft, Bosch, T-Mobile, and other organizations have really dusted off this program to reinvent them in the IT world, and taking that competency-based approach. And the reasons we did this is, number one, we knew that universities were only producing about 10% of the talent that's needed for these jobs. Secondly, we also recognize that many of our academic institutions, frankly, can't keep up with the pace of change and the pace of skill changes that are happening in the industry.

There are some research out there that actually states that the half-life of a new skill earned today is only about three to five years. So, think about that. What colleges are teaching today, those skills are going to diminish in their value in less than three years. So, we really had to come up with different strategies to get more people participating in the future of jobs and industries and in advanced manufacturing, and IT, cybersecurity, and other related industries.

**Mike:** Jennifer, today, you're right on the beam here. As you know, there's such a renewed interest and—let's call them work based learning opportunities, including apprenticeships and internships, and all of that sort of thing. So, it's interesting that your focus is there.

I hadn't thought about that half-life of three to five years. But it really does make sense.

And, Jennifer, as you look at these emerging skills—I'm going to ask you to focus on IT and cybersecurity for a moment if you could—as you look at these emerging technical workforce needs, what sort of gaps do you see? That is,

people entering the workforce: what are they lacking? What is industry looking for? Particularly the technical skills?

**Jennifer:** Well, I do think, Mike, we have a couple different gaps that I'm going to address. One inverses the opportunity gap. Companies need to think differently on their approach to how they develop talent pipelines and their communities. So, from who we're recruiting, to how we develop them to do the jobs of the future. So, having the employers thinking differently around their hiring requirements is really what we need to do to address that opportunity gap. Because we know many of the technical jobs...right? We have many flavors of technicians, whether you're coming from advanced manufacturing or in the IT world to cyber analysts, IT support, software developers.

Many of these jobs, these new collar jobs, don't necessarily require an advanced degree for entry. But we learned that we can teach these skills through community college programs, career and technical centers, and again, apprenticeships. So, thinking differently about the job requirements is one of the gaps that we have right now. We need to really work on reducing what I like to call "degree inflation."

**Mike:** Yes.

**Jennifer:** So, the second gap that we need to address is, just to your point, is that skills gap. Many underestimate the importance of what I like to call "power skills." And I know a lot of organizations like to focus: "Do you have the technical capabilities?"

But skills like teamwork, communication, collaboration, to some of the new emerging jobs requiring things like problem solving, critical thinking. I have often seen hiring managers choose people that are stronger in these power skills area—sometimes more so than their technical capabilities.

I think we're learning that a lot of these foundational technical skills can be easily taught through these work-based learning programs like apprenticeship, pre-apprenticeship, internships, and other sorts of earn-and-learn programs. So, when we think about technical skills, though, I mean, foundational IT skills, understanding how the network components work, to understanding what a command line is, to basic programming.

As my role as an HR leader, as a workforce leader, I've had to learn HTML. So, we sometimes underestimate the value of some of these basic programming skills that are emerging. Skills like troubleshooting, problem solving—you're going to start seeing them emerge as important skills for a lot of the technician roles that we see emerging.

**Mike:** Jennifer, following up on that, I liked your mention of the "degree inflation." Sometimes there's the impression that in the IT and cybersecurity world, that formal degrees are less important. These technicians tend to learn on their own. Is that true? Are they going towards formal education? Are they learning on their own? What's your sense of that?

**Jennifer:** We have seen, through the work at IBM, when we started the program back in 2018, we started off with a small cohort of software developers who were coming from different backgrounds. They were coming from maybe a potential boot camp. They could have been self-taught. Believe it or not, we have a lot of career re-inventors out there that are getting access to really great training that's available online, through our community colleges, went through other means.

So, we recognized that there was a really untapped treasure chest of talent sitting there that could come in and do these jobs with the right program. Right? You just can't wake up and be a software developer or a cyber analyst. So, building these programs like apprenticeship, where you have a structured approach to competencies and to skills training was really an essential way of how IBM went about developing this, what we call, this new collar talent.

So, when you look at areas like cybersecurity, we had great success at IBM. I often look back at our first cohort that included a recent veteran, a professional poker player, and other non-traditional backgrounds that we were able to bring in. We found that they had, number one, the learning agility. They had the interest. And they had the aptitude. Those are some of the three essential ingredients to bring on this new collar skills and new collar talent into an organization. And building a structured earn-and-learn program, pairing them with mentorship within the organization really helped these individuals to achieve wild success.

And I look back at IBM... We had a shoe salesman who's working at a Skecher store. His name was Josh. And he found out about IBM's program, had gone through some community college classes, but hadn't finished. He tested into our program. Got an opportunity to be a software developer. And wouldn't you know, three months later, he had a patent pending at IBM!

**Mike:** Wow.

**Jennifer:** Think about that! Working in a shoe store. No degree. Had some education. And came in and had a patent pending.

I also love to talk about the story of the Starbucks barista who came into a software developer program at IBM. Another great story. He was always wanting to be a software developer, but just didn't have a pathway. And we brought him into the apprenticeship program. And Tony ended up being one of the most successful individuals into the program.

So, the point is many of these, what we like to call "new collar" jobs, those jobs that maybe don't necessarily require an advanced degree for entry, but they do require some form of alternative education. And so, these individuals coming into these programs: we've seen success—whether it's at IBM, whether it's at the Microsofts of the world, the Boschs of the world. Using stackable industry credential programs and apprenticeships are really emerging as this new alternative pathway to building a new talent pipeline for these employers.

**Mike:** And I appreciate your comments on those pathways. Those alternative pathways. That's certainly something that we see emerging across the country, as we look at our own program, **Preparing Technicians for the Future of Work**. Micro-credentials. Alternative pathways. Just an important thing.

Let me ask you this, Jennifer. It's sort of a technical question, in a way, but let me put you on the spot. Does today's IT technician need to be knowledgeable about artificial intelligence? So, do they have to have AI skills? Is that becoming a requirement? What do you think?

**Jennifer:** We have gone through this awesome experience, especially during this pandemic, Mike, where we know that the future of work has accelerated overnight: changing the way we work, changing the workplace, and changing our workforce. Right? This is now a time where individuals coming into these fields need to be prepared for the essential skills in this new era of digital and AI.

Many often say that machine learning/AI is going to replace the workforce. But really, we need humans running these machines and humans working side by side these machines. So, having those digital capabilities and knowledge of digital technologies, digital tools, AI, is going to be an essential tool needed for anybody coming into the workforce.

And great example, I'll use myself and some of my graduate assistants here at the university, who, by the way, do not have an advanced degree or any formal education in any of these computer science fields. But I will tell you, I've had the awesome opportunity to learn how to build a chatbot using IBM Watson AI.

So, being comfortable with the tools, understanding the tools, is going to be essential. Being an AI developer, I think understanding the core essentials of what makes AI work is going to be very essential to the technicians coming into these new fields.

**Mike:** Good. Okay! That's the message I'm going to take home: know the core of AI and you should be okay—for now. Heh!

Here's another question. It's related to AI and coding this time. So, you think AI and machine learning techniques—the new approaches that are coming out there—are reducing the need for people to know how to code. That is, more of the coding is being done by the AI and machine learning systems. Am I making sense? Have you found that to be true?

**Jennifer:** I think what we're finding is that this digital era of AI/machine learning is going to change the face of our jobs. It's not going to eliminate the jobs, but we're going to work differently with the technologies that are being created. And so, when we talk about digital literacy, it's one of the emerging trends that we're starting to see. Especially when you see the advanced manufacturing environments, which here in the Youngstown Mahoning Valley region—we like to call it now "Voltage Valley with the emergence of energy storage electrification—we know that

even in advanced manufacturing, understanding of digital tools, digital technologies, is going to be essential for some of these jobs that maybe didn't need those skills before.

So, when we think about digital literacy, we think about comfort level with computers, understanding command line, understanding the basic elements of computing are going to be essential as we continue to move forward.

**Mike:** All right. Cool. You mentioned advanced manufacturing. You've talked about it several times. That's sort of my background. I think about automation as automating a production line, automating a tool, automating materials handling system. But what does that mean to an IT technician? Can you give us an example of what an IT technician would do to automate, let's say, a business process? How does that work? I'm sorry, I'm a little bit out of my comfort zone there.

**Jennifer:** No, and I think that a great example of advanced manufacturing, and there's Ultium Cells is a joint venture being created here in the Youngstown region in Lordstown. And it's a joint venture between General Motors and LG Chem. And this is where they're going to manufacture battery cells. So, it is an emerging industry. There's lots of growth in the sector. And what we're finding is as we look at our own university students who are going over to that new manufacturing plant, is that the operators who are coming in, doing the new collar work, they're not your traditional manufacturing, where they're conducting a task every 50 seconds on the production line.

**Mike:** Right.

**Jennifer:** These are complex systems that are being run by the operators. And if there is a shutdown, or something happens, they need to have the engineers on site, being able to troubleshoot, to problem solve, and work with the operators to understand how do we get it back up to production. So, these systems are getting more complex. And so, the need for engineers and software developers are going to be essential to making sure that our production lines stay operating.

**Mike:** Okay, excellent. Suppose I am an IT technician. I'm working in the banking industry, let's say. When I try to automate a process there, what does that mean? What sort of skills does that technician need—away from the

manufacturing area—more towards "Let's talk about finance for a minute." Is there a role for IT technicians in that area? What do they do?

**Jennifer:** Well, I think as we emerge into business processes, the most successful way we're going to automate and create great experiences for customers in any sector—whether it's banking, whether it's insurance, or any other industry—having the technicians as part of the design of these business processes is critical, right?

Now think about "design thinking" and the emergence of that as a new skill in the industry. IBM has really led the way with their IBM design thinking. It's really about bringing co-creation to the forefront, where you're not just creating a business process with the business leaders in the room. You're bringing everybody into that process who's going to touch the process. From the initial support, the technicians, to the developers, to the business users, to the business analysts, and even the customers. Bringing everybody together to develop these automated tools is going to be a new critical strategy that's going to help companies really compete and get their product to market sooner.

**Mike:** Okay, good. Now, as a wrap up today, Jennifer, let me ask you to get out your crystal ball. Look out there a few years. What do you see evolving? Emerging? Especially in the technology area? And, you know, of course, what I'm thinking about is, how do we help our educators, in turn, prepare their students for that? So, what do you see coming? And how can educators best help?

**Jennifer:** I have grown up in the information technology world most of my career. And coming over to higher ed was a very strategic move for me. Because I saw that industry can't wait. The skills of the future are changing. This pandemic has only accelerated the way we work. It's accelerated how we work and accelerated who's doing the work. Okay? So, I think it's really important for any institute of higher education to really understand that. Understand that industry cannot wait.

So, me coming over here to Youngstown State University was really very strategic because I knew that higher education and industry had the same goals in mind. And they want to get there. And they want to be on the same trajectory. But they're not quite there yet. So, what we're starting to



find—and here at Youngstown State University is a great example—is we have just launched the YSU Skills Accelerator. And the Skills Accelerator is an online community of learning where we are working to help our students here at the university. We are bringing stackable industry credentials so that our students at the university could stack those onto their degree. Because we know that, if they can get more access to industry needs and industry skills, that they're going to achieve greater employability in the marketplace. OK?

So, micro-credentials, stackable industry credentials, and really, this next-gen education, is really emerging, where we're going to start seeing more hybrid approaches to how students at the universities, at the community colleges, are getting the skills that they need. And also, how those lifelong learners—so, think about those career re-inventors, the veterans, those who are professionals who are currently in the workplace—Coming back to a two- or four-year program is not a solution. But higher education needs to be at the helm of serving the other needs of the workforce.

And so, again, I go back to we're going to see a lot of these stackable industry credentials really start to merge. And we're starting to see it in legislation within higher education. Within workforce legislation. This is going to be the key to developing an inclusive and equitable recovery strategy for our communities.

**Mike:** Great points, Jennifer. Today, as I was reflecting on our conversation, you talked about—right at the beginning—the half-life of a new technology skill in the three- to five-year range. That's pretty sobering, isn't it, to think about that?

And then you mentioned everything from what you referred to as "power skills;" digital literacy, of course, is a critical thing.

And then, as we wrapped up this focus on—as we move forward in the future—these micro-credentials, hybrid learning, new ways of obtaining skills and competencies. So, I appreciate that, Jennifer.

It turns out the commonality between the IT and cyber world and automated manufacturing world...that wouldn't surprise us, would it? To think about the commonalities there?

**Jennifer:** Every company is now becoming a technology company. And the skills underneath those companies are starting to blend together. Integrate together in new ways. And so, I think, to your point, the alignment of all of our industries are starting to come together.

**Mike:** Great. Jennifer, thank you very much for your time. today, and talking to our audience about **Preparing Technicians for the Future of Work**.

**Jennifer:** Thank you.

**Mike:** As we wrap up today, listeners, I'd like to ask you a favor. Right by the link to the show notes, on the website, you'll see something called a Feedback Survey. It's just a few questions, and most people have been answering those questions in under a few minutes. They'll help us improve the podcast. And thanks very much!

Now today you heard Jennifer talk about reinventing IT career training and skills. She talked about a number of things including apprenticeships and pre-apprenticeships. So, that's your task for today. In the Show Notes, I put links to some of those programs at IBM, so you can see how they're structured. There's even an interesting Career Assessment Tool that's free and your own students might be interested in looking at that. So, bring yourself up to speed and see if you can apply these apprenticeship and pre-apprenticeship concepts to your own programs.

This podcast is produced by John Chamberlain at CORD. And thank you, John, for all of your excellent work. And the project is led by Principal Investigator Ann-Claire Anderson, also at CORD. You can find our podcasts at [PreparingTechnicians.org](http://PreparingTechnicians.org) (that's all one word), or on Apple Podcasts or Google Play. A rating and review is always appreciated. And thank you, our listeners, for **Preparing Technicians for the Future of Work!**

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