

GW: Hi. Welcome to the podcast series from the Global Opportunity Initiative. I'm your host, George Westerman. Today's topic is apprenticeships. We have two guests who know a lot about this topic from having studied it in the advanced manufacturing space. I'm delighted to introduce you to Bill Bonvillian and Steve Nelson. Can you just say a little bit more about yourselves?

BB: Thanks, George. I'm Bill Bonvillian, and I teach science and tech policy courses at MIT and do a lot of research on workforce education, including with the two of you. Steve.

SN: My name is Steve Nelson, and I am the program manager for the Global Opportunity Initiative. Part of my background is in corporate education, where I ran teacher education programs at the corporate level as well as K-12 education and workforce education.

GW: Well, thank you. This topic is really relevant right now because, just two weeks ago, the US Department of Labor announced a \$50 million grant program for Apprenticeship Building America to build hubs where organizations can help employers design, develop, and deliver their programs in this apprenticeship area. So the learning from this research project we did is directly relevant to this project, but it's also relevant to other people trying to set up apprenticeships around the world.

But the first real question I have is, what's the big deal with apprenticeships? Here we are at MIT, we do this amazing course work on these topics. Why do we need to do more?

BB: Well, George, let me comment on that. Apprenticeships offer real opportunity to both students and employers. From the student point of view, many students entering the workforce are looking for opportunities. And they're looking for a combination of education and pay. So the opportunity for hands-on paid job training that really complements their classroom education is very beneficial to them in many ways. They're learning skill sets, and they're learning education content.

So apprenticeships can lead to both industry credentials as well as college, community college, technical college credits. And a good-paying apprenticeship allows students to be able to afford the education, make that cost barrier manageable. And it's a way to be in the workforce, where you're earning college credit. So it's a very attractive option there.

And then, from an employer point of view, apprenticeships can really assist employers too. So companies really face-- in many parts of the world and certainly in the US-- a significant gap in obtaining the workforce they need with the skills they need. And many sectors are facing real skill shortages. As new technologies keep coming on, upskilling is really needed. So apprenticeships are a way that companies get to cope with that skill gap problem they've got. Steve.

SN: Thanks, Bill. And to follow up on your point, I think it's important that students have a pathway. We're not just looking at this will be helpful for industry partners. But I think the students really need to know that what they're learning in the classroom translates to something that's going to eventually pay them and get them on a path to financial success.

So for me, when I was in college, all I would think about was, why am I taking all these courses? Where do these credits go? What does it all mean?

But if you're already in a job, and that job is giving you benefits and giving you pay, but it's also paying you to study what you're eventually going to do for the rest of your life, that's really, really important. That pathway opens up your eyes to say, OK, maybe this isn't what I want to do the rest of my life, but it's one way to get my foot in the door, to make that traction to get from point A to point B without all the muddled mess of taking too many courses that will eventually not be meaningful once you graduate. I think that's one of the main things I think about.

GW: Yeah, that's really interesting, this idea that, yes, you're earning money while you learn, but you're also reducing the risk. What I hear you saying is that taking a two-year or a four-year program, investing all that tuition money or taking those loans upfront on the chance that you might actually enjoy this job and do well in it, that's a big risk. And this apprenticeship reduces that issue, and especially for people who may not have loved school in the first place, to make it be part of what they're doing. That's interesting.

And the other side, I think one of the things we've heard in our manufacturing research is that you can hire a person with the skills, but do they have the attitude? And Bill, what you are saying is you can fill these skill gaps. But also, you know who you're hiring at that point because you've gotten to know them on the apprenticeship program. So an interesting opportunity there. So if these things are so good, why don't we have more of them?

BB: Well, George, there's a lot of barriers to setting up apprenticeship programs. In the first case, in the US and in many countries, neither the students nor employers are familiar with these and what they might amount to. But in addition to that, there's a real issue that employers feel, if they put on a group of apprentices, get their skills up, aren't they going to be hired as soon as they've got their skills together by some other employer? This whole poaching problem is a really deep, underlying problem in employment in the US and in other places.

The lack of awareness of apprenticeships means that companies and schools just aren't ready to start planning new programs. The administrative burden of managing apprentices, which is not simple. It requires time, and regulatory paperwork, and some red tape. Those are real issues for institutions like employers and schools to manage.

There's also the cost of paying the apprentices, which employers need to bear. And they're going to have to make an investment where they're not going to get a return for a period of time as the apprentice comes up in skills. So that's a risk they've got to be willing to take.

And in the US and in other places, there's a continuing stigma for those who are not doing college career pathways. So students and their parents in particular need to be convinced that there's a real opportunity here for this learning and earning process that can be beneficial.

SN: And to follow up on that stigma that you mentioned, we spoke to a lot of experts in a lot of different states around the country. And one of the things that they did to remove that stigma-- and I thought it was a great idea-- was they had a draft party. And if you can think about what it would be like to be at the NFL combine or at the NFL draft and have your name called. And then you go up, and you grab your team hat.

This is what they do in some states for these students who are not going to college. It's not like they're going to sit down, and grab the hat, and have that whole surreal, where am I taking my game? This is, I'm taking my work, I'm taking my skills to a company, and they celebrate that. And I think that's one of the great things about some of the programs that are happening in this country. And you just don't hear enough about them right now.

And the other thing is, yeah, the red tape, for sure. All the experts we spoke to, there's just a mountain of paperwork to do to get these things off the ground. And the schools don't want to help with it because they're understaffed. The industry partners, while they need the people, they don't really have the time to invest in filling out all these forms. So I really think we need to find a way, with the money that's out there, we need to find a way to simplify the process and make sure that these equitable programs are available to everybody and that you don't have to jump through a million hoops to do it.

BB: And what we've seen, Steve, as you know well, is that, in some states, there's a team that gets set up at the state level that really helps the employers and the schools work through these issues, that really takes on the burden of simplifying the paperwork and making it very straightforward. And it's pretty key for a successful program in a state or a region or an area to have a group that can really manage their paperwork for you. That becomes very key.

So, like any adoption process, then, the people that are adopting it need to understand that it is better for them, and there's some work to do there. But they also need to understand that we need to make it easy for them to adopt. And some of the things you talked about were both in that situation.

GW: Let's talk a little bit more about that. There are a lot of buzzwords that are thrown around about this apprenticeship idea. And we see buzzwords like red tape, and retention, and pre-apprenticeships, and soft skills, and all these other things. If you had to choose your favorite buzzword, what do you think it would be? Why don't we start with Steve?

SN: Great, thanks. For me, it's collaboration. There's just so many stakeholders involved. And like I mentioned earlier, it's not just industry. It's not just education. It's not just the worker slash student. It's all of those together. They need to come to the table. And I guess you could throw in government as well as a fourth pretty big stakeholder. They're the ones who are writing the checks on some of these programs. But they also want to get value for that return. And the value of that is good workers working good jobs and being productive.

And so once you get all of those people sitting down, that's the collaboration level. And that's where you can say, OK, now this red tape is just a little too much. If we cut that back, if we make it a little easier to implement these programs, we can sign up more people. We can afford more people in these programs. And I think it'll be a huge benefit to not only the United States economy, but when you expand these and scale these globally, you've really got something humming.

BB: George, the word words I'd pick would be earn and learn. I think that paints a very clear picture of what the possibilities are for students. I think it's a very attractive option for them and gets them into the workforce, but continues their education opportunities as well. And that combo, I think, is a powerful one that really can help encourage interest in this program.

GW: I have a quick question here. So earn and learn, I see that those students, that's great. Do you see learning that has to happen on the employer side in this process?

BB: Yeah, employers, there's some fields in the United States where apprenticeships are established. That's principally in the construction trades. But for the rest of the world of employment, apprenticeships really aren't known or understood. They're being talked about, but really haven't been decided on yet.

So from an employer perspective, there really are very significant opportunities here. And there are many new technologies that are in the workplace, particularly from the information technology side. And employers are having real issues in finding employees that have got the skills that they need to perform the new operations that are necessary.

And that's true in the manufacturing side. That's true with all the new technologies that are starting to enter the health care field. That's true in any number of areas where technology is starting to enter the scale.

Look in retail, for example. The new retail models are heavily dependent on IT. Whether it's face-to-face retail or online retail, there's a huge merger of those fields going on. So there's lots of territories where I think an apprenticeship program would have real appeal.

And it gives the employers an opportunity to get that education for their employees, but in a collaborative way, as Steve was pointing out. By cooperating with other institutions-- community colleges, technical colleges, trade schools-- can really help manage this transition for the student.

SN: And just to follow up on that, I'll say one thing is that when I first heard the word apprentice right before I started studying these and talking to some of the experts across the country, my first thought was, of course, something like electrician, or plumber, or welder. You don't think about advanced manufacturing, health care. It doesn't seem like the quintessential apprenticeship.

But I'll give you one example of a program that we spoke to, Zurich Insurance. You wouldn't expect an insurance company to be running successful apprenticeship programs, but they do. They've got this great program where they pay you to go to school for two years. You get your associate's degree. The whole time that you're in school, you're getting benefits. So you're on their 401(k) program, you've got health, you've got health care, dental. And when you get out, you go right into middle management. You've spent two years studying, and you're in middle management in insurance.

And again, you wouldn't think of that program as apprenticeship-like, but that's exactly what it is. It's a registered apprenticeship, and it's probably one of the best programs I've seen. But that's something, if we could scale it out of just insurance, and scale that to tech, to chip production, to manufacturing, especially advanced manufacturing, then we've really got a winning product.

GW: Thank you. Hey, Steve, you had talked about collaboration. And there are so many moving parts here. Who are the stakeholders in an apprenticeship program? And what have you seen for how to get them all on the same page?

SN: That's a good question. So, as a follow-up, we mentioned government. So the government is a big player, the industry partners, the education partners, and then, of course, the workers and the students, the worker slash student. So those are the four people that you've got to get into the table.

And one of the main things is time. Time is a big crunch. Students don't want to work half a day and then go to school all night. They've got lives. Some of these people have families as well. So everybody's got to give a little bit at the table.

Industry's got to back off on some of the restrictions that they have. The government has to pull back on this red tape, like we were talking about. And education has to be able to work flexibly with industry to make sure that they're tailoring their education programs to the needs and competencies that are required for whatever that industry is looking for. And that's a lot of give and take. But there are certainly programs that are doing work in that realm.

You look at Ohio's TechNet, for example, where they've got all of these people sitting at a table, and they do it very well. They do, I think, quarterly meetings, where the schools get to talk to industry. They find out exactly what they're looking for. They bring in students to talk about how their time management is going, what they're learning, and whether or not that's applicable to their job. And then they go directly to their government overseers, and they talk about, these are some of the things that we'll need to change going forward, or this is the kind of money we'll need to make advances in these programs.

GW: So we spent the last two years working on this really interesting project called Mass Bridge, where we've been-- the three of us and the rest of our team have been looking at best practices for advanced manufacturing education around the country. And certainly, apprenticeships has been a piece of that. What are some of your favorite stories for how these apprenticeships are working in this advanced manufacturing space?

BB: Well, I've been very impressed with the programs in South Carolina and, in particular, in Charleston, South Carolina. South Carolina is one of the very few states that has an all-statewide apprenticeship program at its technical college level. It goes statewide.

And then, interestingly, Charleston has added to that statewide apprenticeship program a new program in youth apprenticeships. So they're really aimed at breaking down the work-learn barrier starting at the high school level, bringing high school students-- typically in their junior year-- into part-time apprenticeships with area companies. And they introduce students to a career field where they can build a potential career.

A typical day for a student in the youth apprenticeship program in Charleston in cooperation with the area community college, Trident Tech, they'll start in the morning at their high school. And their employers tell them they've got to take math and science.

And then in mid-day, they go to the technical college, Trident, and take their technical courses. And they're in with a student body not of 16- or 17-year-olds. They're in with a student body at a technical college in South Carolina who is typically 29 or 30 years old. They're in with a much more mature group. This world is already at the workplace.

And then in the later part of the afternoon, they go to their employer, to their company. And there, the workforce is in their 30s and 40s, typically. So it takes high school students-- and all of us know how disruptive and sometimes self-destructive high school can be-- it takes you out of that world and puts you into a much more mature world with a very different world outlook.

And those folks become their friends, and mentors, and colleagues. And it's just a way of accelerating the maturing process, I think, for young adolescents and moving them into a real opportunity space where they can start to see what the world might amount to and how they might be able to do big things in the world. So it's been very successful. And that whole idea of a youth apprenticeship program really struck me as a particularly valuable one.

SN: Great, thanks, Bill. And some of the things I've seen-- again, I'll go back to Ohio because I think that's one of the exemplar programs. And everyone can agree on that, is what they're doing now is far above what a lot of places are doing.

But I'd also like to talk about the New Hampshire program. We spoke to some schools in New Hampshire-- community colleges-- who are really doing the right thing in terms of using the space and the funding that they have to optimize their programs.

So they didn't have equipment at every single school and duplicates because they had a chain of schools that everyone was close enough to so that, if you wanted to study one thing-- say it was CNC-- you would go to this branch. And if you wanted to study welding or electronics, you would find that equipment at a different branch. But all of those branches were close enough to each other so that you didn't have to worry too much about it.

And all of those programs were connected. And so that interconnectivity gives the students a little flexibility. It obviously makes it easier for faculty. They don't have to bounce around from campus for campus, teaching different classes. They can stay at their own hub school. And again, I hate to harp on it, but I love the fact that there are programs out there that are celebrating these things, that are making it like a draft, where you celebrate the fact that you're joining this apprenticeship and take away that stigma.

GW: Thank you for that. One of the opportunities seems to be community colleges. They've already engaged in a lot of this workforce training. And they seem just natural to play a big role in these apprenticeship programs. The study was about what role community colleges can play. Can you share some of the ideas on how community colleges can do a better job of bridging this gap between education and work?

BB: Thanks, George. Community colleges face a series of decisions. Community colleges, technical colleges, trade schools have the ability to bridge the gap between industry and the whole education side by stepping into what's a significant gap in the US into our system by helping with these apprenticeships.

But they're going to have to go through a series of upfront decisions. What role do they want to play? Is the employer going to sponsor the apprenticeship-- the actual apprentice-- and take on the hands-on role, or is the community college? And then the community college, in turn, working with the employers and, obviously, the employers back to the community college.

So there's significant responsibilities depending on what pathway a school will take. A community college is going to need a central coordinating mechanism for their region or for their state to help manage the paperwork, and help manage the registration process in many cases, and then provide guidance and support to help these programs get stood up.

Community colleges are going to need staff to run these apprenticeship programs. They're going to need a dedicated staff that can dig in and really manage these things. You can't run it off the back of the existing administrators. There are going to have to be some specialized folks that take these responsibilities on. And that includes folks that are working with companies to make sure these things are working at the companies, handling the paperwork, and then

coaching and mentoring the apprenticeships, apprentices themselves, to make sure they're coming along and making learning progress as well as work progress.

Another task involves working with employers. And community colleges or technical colleges have got to recognize that the employer has to be upfront in these programs. That's going to be the critical relationship in an apprenticeship program. It's the employer-employee relationship.

So community colleges with successful apprenticeship programs are uniform in emphasizing that employers need to be the focus of successful programs. They're paying. They're hiring the apprentices. So the schools can provide a lot of personalized support, and they can provide engagement with employers and a point person assigned to each company. But the employers have got to be the real focus here.

And look, a lot of community colleges are facing a decline in enrollment in the US. And creating apprenticeship programs is a way out of that demographics dilemma that the community colleges face. It's just creating a new opportunity space for students that's pretty attractive with this earn and learn possibility. So there's a lot of promise here for community colleges.

GW: So we studied US apprenticeship programs. But we know, certainly, there's an awful lot to learn from Germany and their programs, and from the UK and their four-year programs, and these others. If you're outside the US, what can other countries learn about creating apprenticeships based on the work that we've done and this research?

SN: That's a good question. Some of those programs are light years ahead of us, so we might not have anything to teach them. But there are other programs that are up and coming, just like ours are. And I would say that one of the main things, obviously, is collaboration, like we spoke about earlier.

But I would also say is finding ways to reduce red tape and to cut costs. So that's equipment sharing. That's classroom sharing. And that's utilizing the faculty in the right way so that we're not overburdening any part of that system.

And certainly, keeping an eye on future-forward education process. You want to talk about health care. You want to talk about technology. You want to talk about implementing the best programs for the future of work. And that's the best way they can do that.



GW: So, Bill and Steve, thank you for spending time with us and sharing your insights on apprenticeships and how they can work, not only in the US, but also around the world. I hope that you as listeners have gained some great ideas on what's happening, and you can put to work in your own apprenticeship programs as you build them. And as always, if you have any questions or comments, or you just want to talk about this work or any other work, you can write to us at [goi-info@mit.edu](mailto:goi-info@mit.edu). Thanks, and have a good day.