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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 COD, 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 Aaron Osmund. He's the US Lead Education to Workforce Team at Amazon Web Services, and we know that as AWS. Welcome, Aaron! it's a pleasure to have you with us today.

**Aaron:** Mike, thanks for the invitation. I'm just really happy to be here with you.

**Mike:** That's great. Aaron, tell us a little bit about your background. And what do you actually do at AWS?

**Aaron:** Sure. From a background perspective, I am someone who has spent his entire career in the IT education and workforce enablement space. I have been at companies like WordPerfect, Novell, Microsoft, Pearson, and now Amazon. And, in each of those roles, I've spent most of my effort figuring out how to bring IT education and certification tools and educational resources into the higher education and public education space. And the reason I've done that is: at these companies, we have been very passionate about

enabling students to prepare themselves for the emerging technologies in the IT marketplace. And I've loved it! It's been a passion of mine for... I just celebrated my 30th year in this space this year.

In my current role, I lead a team that is responsible for bringing Amazon Web Services education and training into public and higher ed institutions and workforce agencies—kind of a "state level down." Like, we partner with state agency heads and educational experts, and we work with these states to figure out how to implement and integrate cloud education into existing certificates and educational programs within the education system. And, in that, we hope to prepare students for jobs with AWS and our customers. So, that's a high-level summary, Mike, of where I've been and what I do.

**Mike:** That's perfect, Aaron. It's a nice match with our Preparing Technicians for the Future of Work project. So, let me ask you this. You mentioned the cloud, of course. But what are "cloud skills?" And maybe not everyone in our audience might know what a technician does with those cloud skills at AWS. Can you give us a brief on that?

**Aaron:** You bet. Let's talk a little bit about what "cloud" is itself. I think the assumption that people know what "cloud" is can also be an important thing to discuss.

When you consider all the IT work that happens in your typical IT back office, whether that's setting up infrastructure and networking, or enabling software development applications to be available on the net, or anything related to your IT team (in your IT group at your company or your organization) that's happened in the back office, in that closet, or in that room that's always locked... All of that infrastructure, all of those services, are now available from companies like Amazon Web Services for rent. And you connect to it and access it via the internet. And so, "cloud skills" is really about enabling all of the IT skills and networking skills that we used to expect from our IT administrator or support engineer from your office. They now get to do all of those skills and all of that work remotely on systems that they manage via the internet.

Third party organizations (like AWS) provide all of the data centers, all of the equipment, software, and tools that are needed for companies to take care of all of their

IT needs and keep it safe, compliant, scalable. And enable it from a cost perspective at a fraction of what it used to cost to buy and manage all that equipment on site at your company location. So that's really what "cloud" is about. And "cloud skills" are simply enabling all those IT skills that we used to do in that back office through the internet.

**Mike:** Okay, that's a good definition. That's a good anchor point for our viewers. Now, as you think about the workforce, right? I know that's a primary area of your concern. But if you were to look at the emerging workforce that comes to a company like yours, do you see skill gaps? And how do you know what those gaps are? How do you identify where the deficits are?

**Aaron:** Well, we are... As a company, we are constantly struggling. And so are our customers in finding talent that is qualified and ready to manage these cloud applications and cloud services. The bottom line is: there are not enough individuals who are interested in these cloud jobs, or even aware of these cloud jobs that are pursuing educational pathways to be ready for them. So, our biggest challenge isn't even gaps with the current technicians. It's enabling awareness and creating awareness about the phenomenal career opportunities that are available in cloud computing from AWS.

In the US alone in 2020, there were over 1.5 million jobs that were seeking skills around cloud in just the US. And so, we are seeing that the biggest problem that we face is creating interest in and awareness of these potential career paths for future technicians in cloud. So, that's Part One, Mike.

I just want to talk a little bit about that before I move to the "current technicians that are upskilling and reskilling." What we're seeing is that, especially when it comes to underrepresented audiences (students that are from more rural or ethnic minorities and backgrounds), often don't even know about, nor do they see themselves in these IT roles. And so, we are spending a lot of time at Amazon, focusing on helping to create awareness and exposure to cloud education as early as possible in middle school. In high schools. Creating opportunities for them to learn fundamental cloud skills that they will then pursue, and encourage them to pursue additional education in the community college system of the country, to then get the

more specified and important specializations around cloud education that they can find there. So, that's Part One.

And then, for the existing IT professional or emerging technician, we definitely see some gaps. There are strong foundational education resources available in our nation's education system, around core computing skills and hardware skills. But availability of and awareness of "cloud education skills" is very limited. We are actively working on supporting the higher education system to expand their offering to include cloud education topics, so that the curriculum can be more well-rounded and include components of cloud education, just like those cloud services are parts of current IT jobs as they're coming into the workforce, and they just didn't know it.

**Mike:** Sure. That makes sense, Aaron. But thinking about that, what about—let's call them "cross disciplinary skills," at this point. Certainly, you've talked about those IT skills. But what about things like cybersecurity or data science to someone working in this area—the AWS cloud. How much do they have to know about those things?

**Aaron:** This is really the powerful piece, is that cloud capabilities are enabling all of those job areas. And creating new roles in each of those categories that are necessary for the successful utilization and maximization of cloud technology. You see roles in data science, in cybersecurity, in artificial intelligence, and machine learning. You see them in mobile development and applications enabled for Internet access. And at the end of the day, almost every role that you can think of in the IT space is enabled and amplified through cloud technology. So, it's all there!

From a cross disciplinary perspective, the unique part that we're seeing is that "specialization" is actually more important than "cross disciplinary capability." We are seeing companies with significant focus in, for example, as you mentioned, data science. Or cybersecurity. Looking for people that have specific cloud skills in the tools associated with those areas of specialty. They are paid more. They are more valuable. And they're higher demand than a general cloud architect role, for example, in the marketplace. So, while something like a cloud architect that looks across multiple different needs, and administration of cloud services, this specialization is

what's becoming more important in the marketplace to AWS and our customers.

**Mike:** Okay! Now, Aaron, you mentioned artificial intelligence and machine learning. Let's suppose I'm applying for a technician position at AWS. Do I have to have some knowledge or some background in AI and machine learning? Will I get in the door, if I don't? How much do I have to know? I'm really thinking about those programs at community colleges. How much should they be putting in AI and machine learning into those type of programs?

**Aaron:** Great question! I would say that the first thing I would put on the table is that Data. And the maximization, and research, and use of data to identify trends, and market direction, and opportunity for businesses is the fastest growing area and utilization from an AI and ML perspective in the marketplace. Companies are hungry for individuals who have knowledge about how to utilize artificial intelligence and machine learning tools to analyze and take advantage of data to help them point their companies—about where they're going from a product and service perspective, and what's in demand from a consumer perspective—based on those data sources. So, from our perspective at AWS, AI and ML technologies are a critical part of the growth of cloud technology, and super important to have, if a technician wants to spend any space in cloud services in the future.

**Mike:** Well, there's a strong statement! And I appreciate that! It makes sense, doesn't it? Because I see that from other folks we've talked to. We're getting the similar sort of feedback.

Aaron, you and I have talked a little bit about AWS Educate. And I'll put a link to that in the Show Notes. But it's a pretty important initiative at AWS. Can you tell us a little bit about it?

**Aaron:** AWS Educate is one of several learning programs that AWS has provided for consumption of the public. But AWS Educate specifically is providing access to fundamental cloud educational resources to ANYONE who wants to have access to it at NO COST.

So, we've provided access to online learning materials and resources in labs, where someone can come in and really learn about, "What is a cloud compute environment?" What are the storage elements? The S3 buckets, for example (our storage solution for cloud). And learn all about the

fundamental services and products available from AWS. Do it completely for free. Access online labs and resources—whether you practice, and see, and touch, and feel—for themselves, at no cost!

Our goal in offering services like AWS Educate is really about our commitment to train ANYONE who wants access to information about cloud to do so in a way that is frictionless and cost free, so that they can make the decision, really, if they want to pursue a career in AWS Cloud Services.

And then we have other programs, too Mike, like the AWS Academy program, which we're providing as part of the community college system, where students can come and get access to curriculum that we've built. And that's available for the community college system to provide to students to learn about our different services in a more detailed and thorough way. To prepare themselves to complete industry-based certifications from AWS. And get qualified to actually have jobs in the industry.

So, those are a couple of examples of the programs that we're enabling. Our goal with these programs is very simple: enable as many people as possible to get trained and certified and have access to potential jobs. Because the skills gap is so significant that we estimate AWS and our customers are losing millions of dollars a year because they simply can't take advantage of the capacity and capability that AWS Cloud Services provide to our customers for them to use for their businesses.

**Mike:** Aaron, thank you for that. I'm going to make sure I link to both of those initiatives. I'm sure our learners (myself included) need to know more about that to get myself up to speed on those things.

A follow-up question. You mentioned certification. What's more important: a certification or a degree? Now, I don't mean it to be quite that "black and white." But are you seeing a shift away from traditional degrees to more sets of certifications? Or what's your sense of that?

**Aaron:** I think that there's a need for both. And here's what we're really seeing. That industry is still asking for a student who is well-rounded, who has developed and learned about the appropriate soft skills to be successful in the workplace.

AND they want to know that a student is ready for employment from a technical-skills perspective, and validated by a third-party certification, like an AWS Certification offering. I don't see it as an either/or.

But there is one thing, though, to keep in mind. That, if education DOES NOT MEET the need of industry in supplying sufficient numbers of students for the marketplace, industry HAS to find a solution that will. And what we're seeing is companies like AWS (and others) are trying to find ways to enable direct training of students, so that we can supply our need as effectively as possible. Because, frankly, there are not enough certified qualified individuals that have both a well-rounded education and technical skills needed to meet our hiring demand.

**Mike:** That's a good point. I'm thinking on the community college side. Sometimes our programs: they're robust. They're industry-aligned. But they may not have the capacity to totally meet that local workforce need.

**Aaron:** It really is a challenge. And I think online capability and scalability that comes from online deliveries: that's one way that we're seeing education expanding its reach.

**Mike:** Now, as we wrap up today, Aaron, get out your crystal ball. And maybe dial in a "three-year timeframe" on that crystal ball. What do you see evolving or changing as new and emerging technologies come out? New learning methods? What are you seeing in that crystal ball?

**Aaron:** Great question. I think that when you look at the future of tech, one thing is clear. It's constantly changing. And the speed of that change is rapidly increasing. At AWS Cloud Services are challenging to teach because the technology, the underlying services and software, are frequently updating. It's hard to have curriculum that is current and relevant for students to be able to ensure they have the skills they need for the jobs that are available for tomorrow.

And so, what I see happening is a stronger partnership between education and industry, where industry is providing more resources, tools, educational materials, and professional development, for the education system to stay current. And the need for education to spend more time in regular interaction with industry. And enabling work-based learning opportunities that keep industry in the classroom with them.

We need to see more work-based-project capstone projects. And career days. And enabling employers to come and hold mock interviews. And then more opportunity for internships and apprenticeships. To keep industry connected to education, so that industry can have visibility to the students that are coming out of the system, and be a PART OF training them; not just waiting for them to BE trained.

In my view, that's the future, Mike. It's a tighter and tighter integration. I even see education enabling its environment on site, at employer locations, where students will achieve their associate and bachelor's degrees on site in work-based learning environments with corporate funding and infrastructure support to enable it. Because we just have to get closer in order for us to solve the job needs that's coming down the road.

**Mike:** You know, strengthening that partnership makes sense for the future, doesn't it, Aaron? I'm not sure how we can do it otherwise.

**Aaron:** I agree.

**Mike:** Well, Aaron, today, I was struck by several things you said. I've learned more about the cloud services and how it, really, it's an ENABLING feature of the company and what you're trying to accomplish.

And also, that dramatic need to increase awareness for students. Just so that they SEE the opportunities. And I would guess that many of them don't have that awareness. So, I'm glad you and your partners are working in that area. So, thank you for telling us about this and telling us about the trends that you see as well, Aaron.

**Aaron:** It's been a pleasure. And if there are opportunities for more clarity, and another podcast (where we can dive deeper into some of these topics), Mike, we'd love to do it.

**Mike:** Sounds great. I might take you up on that, Aaron!

**Aaron:** Great.

**Mike:** All right. Thank you again.

**Aaron:** My pleasure. Have a great day, Mike!

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**Mike:** Today, listeners, Aaron stressed that industry has to find a solution to their workforce needs. And he sees more connected partnerships with education as the way forward. At least one of the ways forward.

So, he mentioned two important initiatives today: the AWS Academy and AWS Educate. Your task today is to look at those two initiatives (the links are in the Show Notes) and see if they fit—if they can be integrated (if they aren't already) in your programs that address cloud skills, computing skills, networking skills.

I'd like to acknowledge that our audio production is done by John Chamberlain at CORD. And thank you, John, for all of your excellent work. Our project is led by Principal Investigator, Ann Claire Anderson, also at CORD. Thank you, Ann Claire.

And don't forget, folks, as you access this podcast on the website, right next to the Show Notes, you'll see a link that says: Feedback Survey. Take a moment to complete that survey. That'll help us improve these podcasts.

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