The Digital Aspirations for Education Podcast – Episode 1

What IoT Means for Education

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Jared Heiner (JH): Welcome and thank you for joining us on the Aspire Education Podcast. My name is Jared Heiner. I'm the Director of Education and Innovation for Aspire Technology Partners.

Joining me is Lance Ford from Cisco, who is an education advocate, as well as Brian Schillaci, who is an Account Manager and IoT specialist with Aspire Technology Partners as well. We'll discuss IoT and education, and what it means for higher education institutions, and K-12 institutions. We'll help these institutions position their technology a little bit differently.

Brian, I want to direct my first question to you. We hear IoT all the time, and you could ask 26 different people what it means. From your perspective, as someone who has not only worked in education, had some time at Cisco as an IoT expert, and now works for the Aspire IoT practice, what does IoT mean?

Defining IoT for Leadership

Brian Schillaci (BS): IoT is not about the technology as much as it is about solving real-world problems that different educational organizations face. For instance, if a school district uses buses to transport students from long distances, we want to introduce something that gives them the ability to do schoolwork. Additionally, we want to introduce something in the building for security and safety. We use different technologies every day, and we want to combine the different things we use every day with other systems to solve problems on a bigger scale while automating daily tasks.

JS: Brian, that sounds like a whole lot right there, and it almost sounds like we're taking the technology that exists, advancing it forward, and solving problems with data. Would you agree?

BS: Exactly. And that's what it's all about. In a nutshell, that's what IoT is. IoT gives us the data from connected and unconnected things. We tie them to other systems and do something useful with the data.

JH: Now, that's a huge, huge response. And, again, it starts looking at technology. It starts looking at facilities, operations, safety, security, and instruction.

How Can Education Leaders Move Forward with an IoT Directive?

Lance, I'm going to ask you this question because you probably deal with more educational institutions than anyone I know. When you're dealing with an education leader, and you start talking about IoT, how do you start that conversation? What's the first step to help him or her get started and say, "How do I bring my institution forward in an IoT directive?"

Lance Ford (LF): I think the first thing we've got to do, Jared, is identify the challenges that the organization has. You look at a traditional Higher Ed organizations, and you're talking about retention, getting students out of the starting block and across the graduation finish line, and getting that done in four years.

One of the great things that IoT does is it gets you proactive in dealing with situations. Now, what do I mean by that? Let's say a student is enrolled as a freshman, and they're living the freshmen la vida loca. About the third week in, they stop going to class. They don't visit the library in weeks four and five. And maybe they're not even spending the night six in the dormitory by week six.

Based on data that that organization - in this case, being the university - already has, we can proactively say this student is at risk of dropping out of school. We don't have to wait till the end of the semester or wait to see what's going to happen. Based on where you were, your lack of participation, and those data points, we can aggregate that together and say, "Look, we wanted to have an intervention." We may spin up some sort of an organizational meeting between their guidance counselor, their parents, their advisor, and do that proactively instead of reactively.

I think that’s why IoT is such a big deal for schools. We've been in the "Well, what just happened? And let's play whack-a-mole try to figure it out and solve it” phase forever. And now we can see what's happening as it's happening and address it before it reaches mission-critical areas.

JH: Lance, what I really love about what you pointed out there is that, again, all of us have worked in education. The primary goal is advancing students forward. The technology must support that. You hit the nail on the head in terms of looking at this from a strategic perspective. How do we help students become successful?

Let’s say I'm moving down this path as a school leader, but I recognize that what we’re talking about gets a little dizzying. We're talking about student success, but we're using metrics that are coming from the infrastructure that we have. Lance, what's the best path to sit down together with other leaders? How do we get our education folks and our curriculum folks connected to our facilities folks? How do we broker that conversation?

LF: I think the first thing that we all have to realize is whether it's the phone in our back pocket, the laptop that we open up in class, or even a device that we may use as teachers in front of the class, these all our data points in our overall experience of daily life. Brian mentioned the bus. That bus is cranking out more data as far as RPM, MPG, oil pressure, and all that sort of stuff than we would ever want to sit down and sort through. We have got to do what Brian said and create the synergies between these different organizations to say, "Hey, this is what is important to me. Let's start with student retention and student completion. Let's, then, move into parental or student satisfaction with what's going on. Let's talk about providing services that, otherwise, we couldn't provide."

But we have got to stop worrying about biting off the whole enchilada. My grand dad always used to say, "The only way to eat an elephant is one bite at a time." So, we have got to take that literal and say, "Here's the deal, the bit that we're going to bite today is student engagement in classrooms." First, are they there? You can't engage if you're not there. So, we have analytics on that. Based on what's in the room, we can tell you how many learners there are. Number two, are they responding in real-time or near real-time to teacher prompts and engagements? Again, that's another data point.

Guys like Brian take all these amazing data points, and they populate them together so that it's actually understandable - I'll call it music teacher language since I'm the music guy - in teacher language that says 35% of your students are not even in class. And of the ones who were there, only 16% are engaged in rapid response to your prompts, 25% are engaged slower, and the rest of them aren't engaged at all. We can use that data to transform the way we reach our learners.

JH: Sure. I think it also starts calling out the fact that the IoT perspective is all about providing opportunities and options. We've never had so many options to educate our students, which is a shift from the tradition. And that tradition is something we must break away from. To your point, there's all this amazing technology and amazing data points that can be collected.

Brian, my question for you: you've worked a lot with engineers in school systems and a lot of IT directors. They're going to come to you and say, "I've got all these different dashboards. I've got all these different applications. What's the first step to begin to say, "How do I pull this stuff together, so I can have a central location?" Because, again, when we start going out there, we're going to get so much data. It's going to be overwhelming and dizzying. And then, we may be better off - Lance, to your point - eating an elephant. So, Brian, what's your recommendation?

BS: Number one: identify the problem. Because there are so many different systems out there, we need to understand what the problem is and what we have access to. I would say that is number one. That is the most critical thing.

Number two is rely on the experts in this field. Rely on your Cisco team. Rely on Aspire. We work with educational institutions every day around a lot of the problems that they're facing. Rely on the experts to come in and tell you what's available and how we could solve these different problems. I would say that's number one and number two as far as priorities go.

Number three is the assessment phase. We want to see what systems you have and start working together on bringing all those solutions together to solve the problem. Like you said, there's so many different systems out there that, really, it takes somebody that understands those systems and the languages, the problem we're trying to solve, and then just bring it all together in a nice neat package.

We want to make it so that it's seamless to the customer. We don't want them to have to think about the technology. We just want to solve the problems.

JH: Thank you for the granularity and direction there.

Approaching Technology Differently for Education Campuses

You're one of the few people, Brian, that's had the privilege of actually building an IoT lab with a number of different scenarios, and you've actually come up with a unique package, if you will, for an education campus or buildings. From that perspective, if I start from a facility's standpoint, what are some of the more outstanding things that you've seen or approaches you seen from that perspective of saying, "Hey, I want to approach this a little differently. I've got funding. I could just go and do what I've always done, but I'm going to start doing things different"? What really stands out to you?

BS: I really like solving the simple problems first. For instance, a local school close to me had their school districts shut down because of a water break in the facility. We could easily solve those types of things by connecting and monitoring systems. We can give those critical school days back.

In another example, how does the lighting effect classroom learning, or how does the audio in the classroom affect learning? It could be that you have a project where you have funding for safety and security, and you're outfitting the school with cameras and a PA system. How can we use that same system to enhance learning, so it's not just used for safety and security? We'll think outside of the box. There are systems out there. The school district may already have some of those systems. If so, we'll utilize those systems to enhance learning. At the same time, it's solving a problem around safety and security or in facilities.

JH: Brian, you talked about systems and maybe combining systems or shifting to a new system. That is going to make people go bananas. Oftentimes, change is difficult or, albeit, next to impossible.

Lance, you've dealt with hundreds, maybe hundreds and thousands of teachers, and administrators, and IT folks. How do you get them to come on board with this idea of, "We're going to start changing things,

and it's going to be better," and everyone's going to look at you and go, "Really?" What recommendations do you have to move this forward when you're sitting down with your staff and going, "Okay. Here's the game plan."?

LF: Well, step one is what Brian already said to me, and that is rock what you got. I mean, I heard him say repurpose systems for everything, for other things, but when you can literally rock what you got, you've got a common knowledge base where these people already live. Now, I'm a big proponent of having teachers experience things as learners transparent to their learning as opposed to jumping them in and saying, "Hey, I think I know better how you should deliver your class. Here's a great new tool for doing that, and here's a great way to tie all those data points to prove that I'm right."

Why don't we instead let them transparently learn as learners so we can illustrate the process for them? And when we're done with that, step back and say, "Okay. Now, let's look at the data from how I engaged with you guys. Based on this, what should I change in my approach to working with you?" Those sorts of things really diffuse a situation quickly when you're trying to get teachers to explore the opportunities of change.

Whenever you're talking to unionized organizations, they're going to have the best interest of their union members at heart. And, in some instances, they are concerned that jobs are being displaced and/or lost because of what the data can tell us. I think we must provide 100% assurance to folks that this is an opportunity to take what we do to another level. And when I say "we" I'm not talking about you as a teacher; I'm talking about we, as leadership, who to take what we do to another level in working with parents, in working with community members, in building culture, and in fostering relationships on this campus. Let's let the data help us drive that. Nowhere more powerful, Jared, than in the testing. We don't like to use the T word, but it's something that everybody goes through.

I know that a lot of schools are manually building these huge data walls where they are tracking individual learners. Something that simplistic can be systematized, so that a guy like Brian can say, "Here are all the data points, guys. Don't waste your cycles where you could be discussing how to best address what we're seeing with the data. Just putting the data out there. Let's speed that process up, so we can get to a solution faster."

JH: I love this idea. Again, anytime you appeal to the public, or the board, or the president of the college, or your superintendent, you can go with data and you say, "Hey, here's what we're seeing, which is the driver for change."

The Cisco Portfolio's Role in IoT and Learning Spaces

JH: One of the things that, obviously, consumes education, again, from Kindergarten and beyond, is this idea of learning spaces. Again, we don't want to get into us-versus-them mentality, but when we're talking about IoT, and learning spaces, and providing a sound education, how does the Cisco portfolio allow me, as someone in charge of an educational institution, to get the most robust response from my infrastructure?

LF: Well, it starts at the most basic level, which is our ability to count the number of participants who are using any individualized space. That is a data point. You may use that data point for something as simplistic as attendance. You may use that data point to say, "This particular part of our facility does not need to be used between this time and this time because we recognize the people are not coming in and out of this location."

The next step along that data point of "is there someone in the room or not" is proactively saying to someone, "Hey, here's a facility that's available for use. We know you wanted to use this room. It's already taken up. But because we know, based on the regularity and frequency with which people come to this space, chances are good it's going to be wide open, and, in fact, it is wide open." We can know all the way till the moment of participation whether someone is in the room.

The next step in the evolution from "is there someone in the room?" is identifying the person in the room. Some people get "Big Brother" freaked out on me when I mention it. Everybody who's listening, take a deep breath. This is for you to enable if you want to, but we do have the ability to identify the individuals who are in the room, given the fact that we've tied into your database for your user, and the database has a picture. It allows us to look through the Cisco device at the image of the people in the room, and we can match that for basic things like attendance. Is Johnny here or not?

So, as the tool continues to evolve, there will be things like temperature sensors and humidity sensors built into Cisco Hardware that basically lets you know, "Hey, we're using way too much energy in room 4B because, coupled with the analytics, we know no one is in the room. I've got a room temperature of 68 degrees in the middle of the summer. Why are those two things happening? Can we talk to a third system and say no one's in the room? it's 68 degrees based on the Cisco sensors. Can we turn the air conditioning to where it needs to be to conserve our electricity?" Those are just some basic ways that Cisco can now help with the analytics based on the devices that physically can be in the room.

BS: Jared, I want to build on what Lance was saying, and add to my earlier comment about using systems that you already have, or bringing in the experts to let you know what's available, and how you can start tying these systems together and use them for different use cases. With the same location and identification analytics that Lance is talking about, we can now turn that around and use that for a safety and security application to tell you how many students are in a room if, God forbid, there is a shooter in the building or shelter-in-place type situation. So, using one system to solve one problem is great but, now, we can solve multiple problems if we have the right technology in place.

JH: It sounds like we've moved away from this idea that we always talk about: silos and education, and silos in technology. It almost sounds like we have ourselves a working farm, if you will. Lance, you mentioned you were the music teacher. Well, there's me with my similes and metaphors as the English teacher. I think the idea then is that we're looking for a holistic approach to making sure every piece of this bears fruit.

My question, Brian, is from the energy awareness standpoint. I'm looking at what used to be multiple budget lines, and I'm going to be going forward in saying, "Hey, it's going to cost some money. We spend on technology anyway, but there's going to be a savings," What process do I follow to really make an impact with my stakeholders to say, "This is where we're going to be and this is the type of energy we can save"? What does that process look like?

BS: That comes out of the assessment phase. Multiple different states have different funding models for energy savings, but they're all tied to some sort of assessment that will show you what those savings would be. Organizations like Aspire and Cisco do it all the time. That's the easy part. In my travels, I've

found it's more about solving some of the politics that are involved when bringing different groups together within the educational organizations. Each group, including IT, leadership, and facilities, will need to understand why we're doing this, why it's important, and how each group could come together to solve problems. To me, that's probably the biggest hurdle versus an actual assessment to show where maybe something like energy-savings is out there that we need to assess.

JH: Like you said, a sense of success forms when different groups meet to solve problems.

The Impact of Technology on the School Culture

JH: Lance, you are in Howe, Oklahoma, and you have a lot of different technologies. How has that impacted the culture of your school system?

LF: It's interesting, Jared, because, living in rural Oklahoma, there's not a lot of ways that we can grow a student population. I'm going to take just a brief detour here because this is fundamental to what you were talking about with the expenditures. The only way we get money from the Oklahoma State Department is based on who's here and how many students we have. Early on, our leadership - and I am so fortunate to have them - our leadership basically said, "Hey, look, we got to do something different, something that will attract Learners because we really don't have any hope of growing business industry, a large influx, housing population, or anything like that."

I'm pleased to say that, over the last couple of decades, our evolution into this has allowed us to grow a student population to what is almost 63% or so of non-residents. Now, that doesn't mean they don't come to school here. They can still physically come here if they want, but these are students who don't live in the town. So, when we start talking about how this has impacted us, it's allowed our school district to grow in ways that we couldn't grow. We can provide even more resources for our learners.

Brian mentioned the bus initiative. That's something we have going on here. I ran into one of our alumni in a sister community about 40 miles away the other day, and he said, "Man, I got online, and I saw that you guys have internet access on the buses now. Why didn't you have that when I was in school?" But word of mouth helps people understand what we're doing here.

Brian mentioned accessibility. Yes, for sure, but we get data from the bus too. Yes, we provide wireless access to students on the bus, but some of my kids have a one-and-a-half-hour one-way trip to school from their house. Recovering the time is important. We want to know the status of the vehicles. We want to anticipate issues. We had a headlight issue. Sometimes it worked and sometimes it didn't work. Once we used our data and analytics, we saw that there was a short in the headlight whenever the bus drove over bumps in the road. The headlight moved up and down. We were able to rectify it.

It's important for wireless access and for the analytics we receive from the bus. The bus initiative gives us safety and security. We have live streaming video out of those buses, so we can see who's on it, who's entering the bus, and, God forbid, if someone who shouldn't have access to the bus has access, but we know who's on it at any given moment, and we can peer in there.

JH: And all in one breath. That was a great example, Lance, because all in one breath, we're talking about not only providing for students, but we're talking about providing for the facilities operations, and, if you will, the health and well-being of the bus itself. Certainly, you don't want a headlight going out on a bus. Secondly, you're talking about the safety and security of the students. Again, all that technology's there. It exists. And even if the original initiative was providing Wi-Fi connectivity to students who are on the bus traveling long distances, now, it just blends into all these other different spaces. And there's a tremendous value to that.

Next Steps for Educational Leaders

Brian, if I'm interested, and I'm a superintendent, or I'm a Dean, or I'm a facilities director, and I say, "You know what? I'm moved by this." What's my first step?

BS: Reach out to Aspire, who willreach out to your Cisco account team, and let's have an introductory meeting. Let's hear about what your issues are, and, then, we would come in and perform an assessment to give you an idea of what's out there and what to look for. Getting in early on a lot of these projects, I always use the example of a capital project for a new building or building renovation: let's do it right the first time and not have to go back and try to change things after the fact because that becomes a lot more expensive and more difficult to do.

JH: Appreciate that. We're coming up to the end of this segment. Any last words either of you would like to share about your experience with IoT and education or do we save that for another round?

LF: Well, I guess I'll jump in here with one last thing, Jared. You know me, there's always more to say. We haven't even tapped into the conversation around, 'what if we could take the data and allow the students to authentically apply what they're learning in their classes based on them doing the analysis of the data?' That's where we're going with this. It's becoming a part of the learning process, not just something that we do administratively, but allowing the students to step back, and look at data, and take their math skills, take their English skills, take their presentation skills and combine that with the data to do real world help and solutions for our campus.

JH: Lance, that's an excellent point. One of the things that we're beginning to recognize, especially with some of the rural schools, is the access to the technology and some of those experiences that they, otherwise, wouldn't get in the community, especially communities that are agriculturally-based. So, you've touched on this a little bit. Schools tend to operate as businesses whether we want to see them as not. As more and more of these schools and universities turn towards some advanced technology, it does provide an amazing opportunity for kids to get their hands on and students to get their hands on these experiences and really start playing with real-world experiences.

Upcoming Aspire Digital Aspirations Education Podcasts

JH: We have several other education podcasts coming up: everything from assistive technology, curriculum, and laws around cybersecurity. So, there's more to look forward to.

Gentlemen, it is always a pleasure. I look forward to any time we get together. I thank you both for lending your experiences and for giving us a peek behind the curtain into what looking like some exciting opportunities coming down the path. I encourage anyone who's interested to reach out to Brian at Aspire Technology Partners. Reach out to Lance at Cisco. We are more than happy to get you on your way.

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