National Convergence Technology Center
National BILT Meeting
November 13, 2018

Next BILT Meeting: Tuesday, February 12, 2019
8:30am – 10:00am Central

Nisheeth Agrawal, Calhoun CC
Garfield Anderson, Gwinnett Technical
Ericka Bernhardt, Gateway Technical
Ronda Black, Gallatin College
YRenee Blackshear, Texas State Technical
Bruce Caraway, Lone Star College
Nancy Cerritos, Wisconsin Indianhead
Shari Due, Gateway Technical
Mike Eilerman, Rhodes State College
Rafat Elsharef, Milwaukee Area
Kathy Fant, Collin College
Ernie Friend, Florida State College
Stephanie Gray, Gallatin
Richard Grotegut, Bay Area CC
Consortium
Jason Huebner, Waukesha County Tech
Glenn Jones, Tulsa Community College
Kyle Jones, Sinclair
Chris Kadlec, Georgia Southern
David Keathly, UNT
Dante Leon, Daytona State
Xintao Liu, Herzing
Patrick Logue, South Plains
Amelia Maretka, Wharton County JC
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Belicia Miraval, El Centro

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Brian Nelson, Lansing CC
Tom Pensabene, Metropolitan CC
Susan Randall, Cleveland CC
Adam Rocke, Seminole State College
Gordon Snyder, Evaluator
Susan Svane, North Central Texas
Benjamin Taylor, Seminole State College
Dwight Watt, Georgia Northwestern
Tech
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Solomon Zewde, Houston CC
Mercedes Adams, NetApp
Phillip Andrews, International Innovation Centers
Amy Arnold, City of Lewisville
Derriex Betts, Fortinet
Richard Brunner, Collin College
Susan Coefield, Vmware
Vincente D'Ingianni, Binary Systems
Matthew Glover, Le-Vel Brands
Bill Morgan, Avistas
Lynn Mortensen, ex Raytheon
Kurtis Sampson, Philips
Candy Slocum, InterLink
Glenn Wintrich, RDM Innovation Training
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Trends

Mark – We got a question last week from the CCN (Convergence College Network): what should community colleges be teaching students about AI and machine learning?
Matt – AI and machine learning are powerful entities. As I was saying last quarter, it’s the combination of technologies that is driving cultural and transformational change because it’s that integrated innovation that is moving us beyond what just AI can do or what just machine learning can do. If you remember, last quarter I talked about AI, machine learning, 5G, augmented reality, IoT, and blockchain. All of these technologies combined are creating a new tension in the technology landscape that are driving new industries. They’re able to give experiences.

Let’s start with AI. When you look at Amazon’s efforts to embed itself into the consumer households, they’re doing that through a product called the Echo. That’s an AI assistant named Alexa. I’m sure some of you have that in your home. Amazon is managing your life, not just your shopping needs. I think that’s one of the big things that AI does: the embedding of technology to make life easier on everyone. If you have a Nest in your house, that’s machine learning-style technology. The AI portion of Nest takes in data from you walking in front of it and saying “I’m here” and or you manually putting in data on what temperature range you like to stay within. The Nest takes that data and continues to learn from your patterns: when you’re home and when you’re not home, what you set it at, what you don’t set it at. All of that capability then starts to drive the comfort level of your household in a form of temperature. Those are the evolutions to a simple thing like a thermostat. There are whole new buildings being built on Amazon lockers. Amazon is so integrated now into everyday living that new apartment complexes are being built that incorporate Amazon lockers in the design. People now trust the company with digital access to their homes and let couriers make deliveries when no one else is around. These are things that are completely transformational from where we were just two years ago. GE is equipping field technicians with cutting-edge augmented reality glasses, changing the way workers engage with the physical world by giving them hands-free access to information. It also allows for them to use remote experts to see exactly what the technician is seeing as they repair a wind turbine. You don’t have to have that expert climbing up into that wind turbine. You can have a technician up there and then the engineer could be back in his or her office calling the shots for that technician to make the change, the fix, or the modification.

Here’s another very interesting example – there’s a Chinese education firm, Liulishuo, that’s changing education by introducing a sophisticated AI. It’s a powered English teacher that delivered personalized adaptive learning to millions of people. 


There’s another thing that recently came from Thomson Reuters and their ability to try and compete in a 24-hour news cycle and predict accurate information in a world of not-so-accurate news. They developed an algorithm that uses streams of real-time data from Twitter to help journalists classify sources, fact check, and debunk rumors faster than ever before.


Those are some of the interesting changes happening in the world around us. It’s the combination of AI, the combination of machine learning, the combination of a faster mobility platform like 5G, the combination of augmented reality and virtual reality glasses and capability, the combination of IoT and mobility, and the combination of blockchain that all are driving those cultural transformations that we’re seeing in those leading-edge companies today.

One of the big questions is, how will that impact educators? How is that going to transform the way we work? It’s going to be a lot faster than I care to admit. Machine learning is a subfield of computer science that evolved from pattern recognition and learning theory from way back in 1959 by a guy named Arthur Samuel. He defined “machine learning” as giving computers the ability to learn without being explicitly
programmed. There are a multitude of companies out there, emerging and “old school” companies, leveraging IoT. For a machine to learn, it has to have data or sensors to drive data patterns. The more sensors, the more data it collects, the faster it learns. Siemens has pushed sensors into a lot of their chips to cement themselves as an integral part of the IoT universe. They often use the Mindsphere operating system for the internet of things and putting those things in manufacturing devices for anyone.


Ann – I think we’re going to be using AI and things that are powered by all of these other technologies. But what should we do to teach students, other than awareness? I don’t know what we teach. We keep asking what the curricular changes need to be. Do we know that yet or is it unfolding?

Matt – It’s still unfolding, but I think if you lay out a foundation of what the capabilities are it may be the students in your classes that can teach things that you can’t. You constantly see people who come into the education system, see something that no one else has seen, drop out of college, and start a business. It happens time and time again. The things that I want them to be aware of is: what is AI? what is machine learning? why is 5G different than 4G and why is that important? what is AR and what is VR? what is IoT? what is mobility? what is blockchain? why do people like me speak about them all combined together like this? It’s integrated innovation. They don’t all stand solo. They stand together and those capabilities start driving a higher degree of machine learning and AI capabilities that we’ve never seen before. If I start pulling out blockchain or mobility or IoT or AR and VR or 5G, and I just have machine learning it’s not as effective. It’s not as powerful. But when you start to pull all of those things together, that’s powerful. Those are the big pieces that I see in educating our future students – making sure that they don’t look at one technology as a solo thing. It’s not like it used to be back in the 70s and 80s when we had a new technology and there wasn’t a lot of integration. There wasn’t the capability of integration. Today, in 2018, integration happens through a series a APIs. In my business, I can do it within hours. Sometimes, for bigger businesses, it’s going to be weeks or months. We’re not talking about years anymore. They should understand that when new capabilities are pulled into the world around us, you can tie those APIs directly into a machine learning platform and start having them get real-time feedback, whether that’s business intelligence capabilities or technical intelligence capabilities or social (like my earlier Thomson Reuters example). All of those capabilities are things that I’d want our students to know.

Glenn – I’ve been tracking a couple of things. One is related to AI and machine learning and how it’s going to impact the enterprise. We’ve all talked about software-defined networking. It’s expanded out and now it’s enterprise-defined networking. It goes far beyond just the data center of what it can do. It makes sense when you think about it. The routers, the switches, the wi-fi, everything else – it’s all becoming part of an ecosystem of IT. It’s not just a data center anymore. Machine learning and AI are going to create the ability to start making many more decisions. Software-defined networking makes a lot of decisions, but it’s going to escalate exponentially as time goes by. It will learn your data center, it will learn your enterprise. It will start doing things to save power, to turn networks up. If a conference room holds 50 people and there’s a conference scheduled from 9 to noon, it will ramp up the amount of data transfer available in that conference room, but it will do it without human intervention. It will just look at the systems and do that. That’s one of the things we’re going to see as software-defined networking expanding out into enterprise defined-networking. AI is going to be critical to the success of that in large enterprises. That’s one thing that is clear.

The other one that you brought up, Matt, was related to 5G and the internet of things. The internet of things has really been held back even though there are literally 100+ million devices out there. That will go to the billions with 5G very quickly. It gives you the ability to tie them into the network without having to have
more infrastructure. The **5G bandwidth and speed** gives you that capability. Probably most importantly, the lower latency and speed allows you to start using the internet of things. We talk of time as humans in seconds and minutes. When you’re talking about controlling petroleum devices, you’re talking about hundredths of a second or thousandths of a second. We can’t do that with a 4G network because of latency. You could do it in a limited place, but if it requires real-time or near real-time, 5G is going to give you that capability. For our students, understanding that the infrastructure related to a digital oil field is going to change over time for the people who haven’t invested in a lot of the infrastructure to do it under a 4G world. That’s a big one.

One thing you didn’t mention, Matt, which I’ve been tracking for about a year now, is **li-fi**. It sounds like it’s out of science fiction having the equivalent of a wireless LAN transmitted through a lightbulb. It’s been measured in the lab at over 200 gigabits of speed. In real world usage, like in buildings, over a gigabit of speed is far faster than wi-fi. The biggest and most recent change – and I’ve been watching for regulatory hurdles and IEEE standards – has been that the retail industry now has a suitable wall- and ceiling-mounted devices where they can start changing out lighting and putting in LED lighting, which is what transfers the li-fi signal. When you think about it, you say “Why is that important for retail?” The obvious reason is how much data is utilized in retail, especially if you go to real-world tagging where there’s digital tags on the shelf. So people don’t go out and change the price on items. It’s done digitally. A store uses a huge amount of electricity and you can cut the use of electricity by about 60-70%. They can replace fluorescents with LED lighting and save money. The payback period of less than three years and they can have all these new capabilities where they can innovate around customers, innovate around stocking and shelving. Retail looks to be the industry, followed by health care, where it’s going to take over. Europe is starting to see early installations. It’s bleeding edge, but with the rate that it’s moving just in the last year to go from labs to real-world testing, it’s going to be growing with exponential growth. We’ll see it in Europe first. That will be the tripwire forest. I think students are going to have to start understanding if you are building a new building two years from now, you probably won’t put wi-fi in it if it’s a large building. You will probably put in LED lighting with li-fi. Hospitals have a lot of interference, but that doesn’t affect li-fi like it does wi-fi. You are going to have new opportunities in health care.

The most important thing that Matt said was that students need to understand even though they may only work on the li-fi network or the 5G network, they’re going to have to touch a lot of things and understand them. If they don’t understand the business and the overall scope of what’s being done, it will limit their ability to meet and satisfy customer needs. You’ve heard me talk about Perot Systems. They had a six-week academy for all IT employees that were going to work in health care. In the academy, employees had to learn about McKesson and Cerner and MRIs and all the different things, so that when a nurse or a doctor talked to them about an IT problem, they understood. For example, if someone said “My Cerner system is running slow,” the employee knows that it’s dealing with electronic medical records. That gives them an idea of where to go to start looking for the problem. I think that, like Matt said, it’s not that you have to be an expert on everything but you certainly need to be aware of how they all tie together so you can be successful.

**Chat box comment** – A CCN member states that their BILT believes basic computer technology and math backgrounds form the backbone of most AI programs. Entry-level positions require at least a bachelor’s degree. Would you agree?

**Matt** – Absolutely not. This is a fight that I keep fighting. I agree with one portion of the comment and I completely disagree with the other portion. I think the backbone comment of mathematics and basic computing skills is absolutely true. I disagree that it requires a bachelor’s degree. With everything that I’ve
learned and all the degrees I have and all the on-the-job experience that I have – 28 years in the industry – the foundation of how computers operate, how they communicate, how they interact with each other are the basis of all of the technological decisions that I’ve made as a chief technology officer. When you think about it from that perspective, it’s important that students understand the basics of computing. They need to understand the how and the what. I would say in the first two years of college – if I removed all of the English and history and the extra classes I took that were not necessarily specific to my degree choice and focused only on the classes specific to what I needed to learn coming into the industry – I would have only needed an associate’s degree to be able to effectively be a technician going into that field. Quite frankly, before I went into my degree field, I was already a journeyman electrician and electronics mechanic on attack submarines. I had no degree. Having a basis of understanding in those core classes equipped me so it was very easy to transition through all of my college and into the current career path that I’m on. **Making entry-level positions have a bachelor’s degree is an absurd requirement** in my opinion.

**Bill** – I would second that. I’ve been in this industry, like yourself, for about 30 years. I’ve been traveling around the world this year to Nepal and just got back from Kenya. We’re working with governments and cities and other community college districts around the world. We’re looking at this concept of digital apprenticeships and programs. A lot of people outside the United States are interested in just getting the knowledge and aptitude they need to execute, like a digital journeyman minus the expense of a $100,000+ of a four-year degree or advanced degrees. They’re focusing on this convergence of digital lifestyles. To the discussions earlier on all of the convergence of technologies, these are like digital on-ramps to desirable experiences – user experiences or customer experiences or lifestyle experiences. They’re also managed by social pressures and regulations and laws put in place. The other element I think people need to pay attention to are the differences between privacy and secrecy and how compromises are made for convenience for an improved experience. Where do you draw the line on things that maybe should not be so public? Of course, those that are in the blockchain camp believe everything should be open and fully transparent. There’s always this tension. The success of students coming through today is really not just in the capacity to understand the much bigger picture than just the technology itself, but also in how to make a material difference right now by being able to execute and activate a change or create a better experience along the way that’s marketable, that people are actually willing to pay for and support. If we can help the students open their minds, they can begin to see themselves more like digital artists and less as a network tech or a data administrator.

**Matt** – Well said.

**Glenn** – I would agree. I met with one of our newer BILT members and he’s the CTO for a business analytics company. He said that for every data scientist with a PhD or a master’s degree with a lot of experience, you have a team of six people. Four of those six could be people with associate’s degrees and do things like data visualization or data mining. There are a lot of jobs that we have a tendency to give to people with bachelor’s degrees or higher. We are underutilizing those bachelor’s skills when it would be better off, more cost effective, and more fulfilling for the employees to have it be at the correct level – the associate’s degree level – and then let them grow into the other jobs. I think we’re going to consistently see that across the spectrum.

**Rick** – I like what you all are saying. I’m new to the forum here. I’m also an adjunct at Collin College teaching cybersecurity. The thing to think about here is that you possibly have two different tracks. You have that track where you’re looking to get the people out there into the working community. I came from Wisconsin and that would be like a vocational school. Here in Texas, that’s covered by community colleges. Some other states might be the same. The other track would be those that think more of a **system of systems**. I come from the DoD intelligence community development side as well as retired Air Force. Not all people think of a
system of systems. There should be an ability for a student to place themselves into some kind of track. I’m not trying to create walls here, but at least make a difference in courses at the associate’s level. One that you train the journeyman to do the type of job to get him into the career field quickly and the other to potentially, “okay, I want to go on for a four-year degree.”

**Lynn** – Coming from Raytheon I always said we were **“bachelor’s degree arrogant.”** We just had to have everybody have a bachelor’s degree. What we really meant by that, I believe, is that we wanted employees to have those critical thinking skills and somehow there was a belief that you had to go through a four-year degree to get that. I don’t believe that’s true. I think you get those skills when you go through an associate’s degree and there are many, many jobs where an associate’s degree would be absolutely perfect. Maybe there’s a little bit of marketing needed to explain that an associate’s degree actually gives students all of those basic critical thinking innovative skills that employers need, as well as the basic technical skills they need for a particular level of job. I think many of these employers are looking not only for filling a current job but they’re looking for potential. Some folks, I believe, ask for the bachelor’s degree because that implies potential that perhaps an associate’s degree doesn’t. Which I think is wrong.

**Mercedes** – I agree with you. What you said about the requirement for a bachelor’s, there tends to be a little bit of an **industry bias** that we think we’re getting top quality candidates because of that degree. It’s interesting because technology is fundamentally unbiased. I’ve seen so many students who are 16-18-years-old and implementing AR and VR technology in ways that just amaze me. We’re trying to level out and change some of the industry bias to do more of the hiring the way Glenn described. We may have someone with a PhD or we may have a team of people with masters and BAs, but also I think we need to look much more broadly and that requires a fundamental shift in our hiring practices. I know that a lot of Silicon Valley tech companies are exploring apprenticeship models today. I wanted to add that there may also be other biases at work for people who are saying “You need to bring a BA to get certain jobs.”

**Candy** – I’d like to piggy-back on what Mercedes just said. I just found out that IBM and 30 other companies are offering now what they call a **“collarless job.”** There’s not a collar to it at all. It’s young people coming out of high school and other non-degree programs and they’re entering into IT jobs. They can be application developers, system administrators, data center technicians, project managers, software designers, tech support representatives. The list goes on. What they’re doing is they are taking them out of the high schools and working with them to go into programs that will train them for these occupations. There is no collar. It will be no blue collar, no white collar, and not necessarily a degree. It’s the skills they have out of high school that they’ll build on, I’m assuming, that it would be more “train your own” like what the auto manufacturers (Ford and GM) are doing for their repair technicians. That’s a brand new concept.

**Matt** – I love that, Candy. It’s like a T-shirt: no collar.

**Candy** – It’s something I think we ought to look into. The minute I heard about it, I knew I had to share it with the BILT. They’re working with seven states and I’m trying to figure out which seven. Texas needs to be one.

**Kim** – What I think is a really important underlying skill with all of these technologies is **secure coding.** I know a lot of this relies on application development, but I don’t know that we’re teaching students how to securely code to protect that code. Coming in after the fact exposes us to a lot of vulnerabilities. Much of how we live is digital and so much of cybersecurity is around human behavior. From a very early age, we really need to be teaching everyone appropriate “cyber hygiene” behaviors. So much of preventing these things is related to
human behavior. I think that’s a fundamental to scale that everyone is going to need to learn as we go forward. 

Matt – Yes, that’s a really good point. There are two components that I didn’t get a chance to touch on before. One is 3D printing. The other is the continuous adaptive risk and trust models that are being built right now. Because of digital business and the evolving security environment, we have to continue to increase our sophistication and put new tools in place to protect us from those types of threats. There’s a new process thinking capability that’s out there called CARTA – continuous adaptive risk and trust assessment. This allows for real-time risk- and trust-based decision making with adaptive responsibility for security-enabled digital businesses. Again, that’s AI and machine learning tied together in trying to protect us. It’s distancing itself from traditional security techniques.

Glenn – I want to follow up on that li-fi conversation. I looked it up. In 2018, it’s already a $6 billion industry. Most of that is outside the US. Since it hit $6 billion already it probably will require our staff to start at least gearing up an understanding of how it applies 5G technology to light and how it will change the businesses. I don’t think it needs to be in the curriculum today, but it may very easily need to be in the curriculum in 3-9 months. It’s time for whoever teaches in that space to start reading up and understanding it and recognizing the opportunities where it’s going to apply first. My other comment is almost just a phrase – we used to talk about DevOps. That’s being changed. Now it’s SecDevOps or DevSecOps and they’re saying now not only bring in your operations team into development, bring your security team also. That’s something to think about in terms of the ecosystem of development that now includes not only the operations but security operations.

Amy – Do you think the li-fi is something we need to be looking at? I think it’s kind of niche. There’s some problems with distance. What’s also in that space is wi-fi in the lower frequencies. I don’t think anyone’s going to replace all of their wi-fi equipment with one or both of these. I think it’s really going to be in that interoperability. If anything takes over, it looks like it’s going to be 5G and cell technology. I think for a long time it’s going to be: how do you operate all of these multiple different wireless technologies in one field?

Glenn – I’d like to push back on that. On the li-fi, people aren’t going to rip out functional wi-fi system and replace it. But as wi-fi systems come to upgrade or aren’t meeting requirements, because of the fact that when you replace fluorescents with LED lighting that you save energy, there’s going to be a cost savings that helps pay for the project. That’s what’s driving it forward in Europe right now. But you’re right – it’s going to have to be interoperable because light doesn’t go through walls (which is a good security thing, by the way). They will have to interoperate because people aren’t going to rip out even an old network unless it’s not working. Retail will rip it out. Hospitals may also put it in. Those are two almost green field approaches for the new abilities that they’re going to get. There are going to be industries that are going to rip and replace.

Amy - You also have the delay of when client radios and receivers will be available for those technologies. There’s always that lag. I think you’re looking at multiple years of both or multi, maybe not two, but two or three different technologies in the same space.

Glenn – The technicians will have to be able to deal with all of them.
Matt – I agree that there’s going to be some overlap. I would only caution against the thinking in numbers of years. As fast as I’ve seen some transformation happen, I’m not thinking this is going to be a decade-long evolution. We’re talking about under a decade of all of this transforming before our very eyes.

Amy – There’s been some pressure on the wi-fi alliance to keep standards backwards compatible. We’re still supporting 802.11b devices far longer than we should be. I think that cycle of change definitely shortens if the backwards compatibility isn’t quite as far back.

Mark – We have one last quick question in the chat box.

Christina – In regards to AI, one of our CCN members says they’ve repeatedly heard the need for these AI skills: Python, R, Hadoop, Java, Spark, and SAS. Does the BILT agree with that?

Matt – AI is one of those emerging platforms. I think Python is a great software development skill to have. It seems to have the longest legs in that space. I do not disagree with that statement, but I think the only thing I would caution is having 5 or 6 different skills to try and teach an associate’s degree. That may be a little out of reach.

Bill – I’m working with a number of the up and coming AI companies. I’m helping them raise funds and grow and that kind of thing. What I’m seeing is that a lot of these AI engines have their own language, their own development framework. It’s really a function of the students understanding how to program a code in a variety of different frameworks that are dealing with metadata and XML to then learn the particular engine that they want to develop on. It’s more of a platform-centric schema.

Ernie – Those skills are also the same skills that are needed, at least as our BILT is telling us locally, for big data and data science. We’re actually creating an AS degree that has all of those courses mentioned in a two-year degree. I’m really excited. But at the same time, I think a lot of employers expect those kind of skills to come from a bachelor’s or a master’s. I think the challenge is going to be how do we convince the HR departments that the skills we’re giving students at a two-year degree level are equivalent or as good or better than the four- or six-year degree.

Matt – One of the biggest battles students face is that they’re having to battle AI and machine learning because HR puts AI systems in place to check if applicants have the necessary skills and keywords within their resume. This is before it even floats your resume up to a level where anybody can see it. If they put one of those requirements in there as having a bachelor’s degree only, that essentially eliminates everybody graduating from that space. That’s an industry trend that we need to disrupt.

Glenn – We also have to keep in mind that in 60 hours in some states you’re getting far less than 30 hours of technical training out of your associate’s degree. We aren’t going to teach them multiple languages and have them skilled in AI and machine learning and how to fix data center infrastructure all in 30 or less hours. Collin is very lucky. I think we have far more than 30, California far less than 30. I think it’s a matter of – are we expecting too much from an associate’s degree? In some states, the answer would be a resounding “yes, we are.” You aren’t going to get it in an associate’s degree unless you say “we want to make someone an AI programmer” and that’s going to be their associate’s degree and that’s all the students do. It’s the old phrase you’re trying to put 10 pounds of potatoes in a 5-pound bag. That’s where I think we are as we move forward in technology. Either we have to start having a technology-only degree, which I don’t recommend, or we have to start having a lifelong learning approach as they go out into the market. Students do convergence
work, then they move up and they start taking additional courses and get certification in different things like Python. I think trying to cram it into 60 hours is not the answer. That’s just going to be a fool’s errand.

**Gordon** – I agree with you 100%. I spent 30 years at a community college and in the last year I’ve been teaching at a university. I have the luxury now of going a lot deeper into the different topics. You have twice as many courses offered that really doubles the time. You try to cram too much into a program and it just comes off sort of skimming the top. I don’t know what you do about it, but I can honestly say my bachelor’s degree students are much better prepared just because they’ve spent twice as much time on the material and gone deeper into the topics.

**Mercedes** – Just one more comment from the industry view. Ernie, I’m excited about your two-year degrees in data science. There is a lack of people with that focus that we can hire. We are again back to looking at alternative hiring models. When there is a gap in employable people and you’re putting candidates in front of businesses, we evaluate the benefits of hiring somebody who might have an AA degree into a role where they could grow and go into programs like our academies. I think there are benefits in helping people identify an expertise and an area to focus, then add these other skills on the job. Those are the models that we’re looking at: the best of both worlds. We’ll certainly still hire Gordon’s bachelor’s students because there is that industry bias. I think we are creating new entry points and building up a broader pipeline by evaluating people at all areas of the education spectrum.

**Glenn** – You have a really good point: hiring at the associate’s degree and having them build and learn. One of the things that colleges can do to directly impact that model is to start working locally. I don’t mean people in Dallas working with people in California. I mean the people in California looking at what the business requirements are. As we did at Collin with teaching security courses on Raytheon and Dell properties, the industry should look at a model where you say you’re hiring the guy with the associate’s degree but we’re right behind him with an education department that can teach Python or Security+ to your employees that don’t have it. We go broad and diverge, but then converge in on your local community and start looking at certifications or individual courses that can be offered as follow-ons to that associate’s degree to meet business needs. When they say we’re hiring even though he can’t do everything we want him to do, we know the infrastructure is there to get him to where we want to be. That’s a critical point.

**Mercedes** – The benefits to the business is just in the last point. If it wasn’t clear, we actually save money and we get a better employee in the long term. I think that’s the investment opportunity.

**Gordon** – The best students I have in my classes right now at the junior and senior level are community college transfers. They already have associate’s degrees. They come in very well prepared. They’re certainly ready to learn new things and go deeper into the topics.

**Roll call**

**BILT model and KSA process dissemination**

* “CCN Summit” meeting (Sept 27-28)
30 attendees from 23 institutions in 12 states
Offered a deep dive into specific best practices, including BILT essentials and KSA workshop
Ann Beheler spent 4½ hours on those topics
Post-event survey: 83% report that attending the Summit has persuaded them to consider improvements/adjustments to their current BILT
Everyone raised their right hand at the end to be deputized as KSA facilitators

* **“CCN 101” one-hour webinar (Oct 1)**
  Overview of the CCN – the responsibilities, the benefits, the yearly report
  A good portion of the webinar was about the importance of the BILT and KSA process

* **NCPN conference, Louisville (Oct 11-12)**
  BILT chair Matt Glover panelist with Ann Beheler
  “Long Term Employer Engagement” panel – 45 attendees
  “Actively Engaging Employers Boosts Recruitment and Gives Students the Skills That Get Them Hired” panel – 80 attendees (SRO)

* **ATE PI conference, Washington DC (Oct 24-26)**
  BILT members Glenn Wintrich and Tu Huynh panelist with Ann Beheler
  Concurrent session “Building and Deepening Employer Engagement” panel – 100 attendees, 30 stayed for discussion in follow-up session
  “Keys to Successful Educator-Industry Partnership” panel – 40 attendees
  Photos: Ann, Glenn, and Tu on the podium (top) and a shot of the back of the room looking forward to the podium – big room that was very full (bottom)
* Big thank yous to...  
Matt Glover for presenting at NCPN conference, Louisville (Oct 11-12)  
Tu Huynh and Glenn Wintrich for presenting and helping at ATE PI conference, Washington DC (Oct 24-26)

* BILT workshops across the country  
Ann traveling to workshop in person the BILT model and KSA process  
  Lehigh Carbon Community College (PA) – all technical programs  
  Metropolitan Community College (NE) – for one subject, interest in others  
  Forsyth Community College (NC) – Ann giving workshop today  
  Miami Dade College (FL) – wants to develop BILT for cybersecurity

* Toolkit  
CORD and CTC collaborated to produce a 12-page BILT toolkit with links to sample invitation letter, phone script, KSA worksheet  
The goal is to be able to give this to someone cold and they’d be able to implement the BILT model and run a KSA meeting  
bit.ly/BILTtoolkit

* New color tri-fold brochure - “An Inside Look at the BILT”  
Very popular – used at conferences and meetings  
Will soon be printing them up professionally, rather than printing in-house as we go  
A revision of a previous BILT brochure – adding more useful content  
bit.ly/BILTInsideLook
* Summer KSA revision
The updated KSA list went out to CCN September 5
For the first time, it’s also been posted on the CTC website – before the KSA sheet just went to the CCN but now we are providing it on the public website via a clickable button to increase dissemination
Also added to the website a 5-minute YouTube clip explaining how the KSA sheet works

* #BILTwednesday
Every Wednesday, we tweet a BILT tip or best practice
Since Jan 2018, 34 tweets creating 7067 impressions (views on Twitter) and 29 engagements (retweets, likes, replies)
Also started doing short 15-second videos (narrated PowerPoint) of BILT tips – so far three videos have gotten 46 views
Biggest tweet is the first one from Jan 2018 (415 impressions, 5 engagements)
Candy compliments the CTC on using technology like this

**IT skill standards**

* NSF ATE project grant awarded September 2018
* Started gathering first set of business leaders – 50-70 to help finalize the IT job clusters
* Next: recruit 400 business leaders to help identify and verify the skills within each of those clusters
* Ann asks the BILT to help us find suitable business leaders to participate in this project – either members of the BILT or connections/people the BILT knows
* Email Ann if you’re interested or have suggestions
* First meeting planned for late January/early February for the 50-70 business experts to help finalize the list of IT job clusters
* Learn more by reviewing...
  * The project summary ([http://nationalctc.nationalctcwiki.org/_media/itss_project_summary.pdf](http://nationalctc.nationalctcwiki.org/_media/itss_project_summary.pdf))
  * The project flow chart ([http://nationalctc.nationalctcwiki.org/_media/itss_flow_chart.pdf](http://nationalctc.nationalctcwiki.org/_media/itss_flow_chart.pdf))

**Student portfolios**

* A longtime BILT request that every IT student create and curate portfolios
* The CTC renewal grant has a student portfolio research project written into the goals
* We found a subject matter expert in portfolios - Louise Kowalski, IT Department Chair (Erie CC)

**This fall**

* Louise spoke at the September 2018 “CCN Summit” and will also present a free one-hour webinar Friday November 16 to share her practices to a wider audience than could attend the summit
* Her focus is the value of LinkedIn and digital portfolios in seeking employment – she presents best practices and also shares ready-to-go exercises for instructors to use
* Employer survey (CTC BILT and Louise’s business council) taken prior to CCN Summit: 50% of surveyed employers said they would be “more willing to hire” a student who had a portfolio
* Attendee survey taken after the CCN Summit: 70% of attendees do not currently require students to create & curate a portfolio (of those who do not, 71% will consider requiring students to do so)
* Many schools out there are not doing it, but those who hear Louise seem to want to try it

This spring
* Roll this portfolio model out to the partner schools
* The plan:
  • Pick a suitable 2nd year class
  • Use Louise’s exercises
    - Personal branding (integrates with LinkedIn profile)
    - Making a LinkedIn account
    - Creating and curating e-portfolio (Google Sites)
  • Make it a part of the grade
  • Track impact via student/faculty surveys and LinkedIn profiles – to see what happens next
* All eight partner schools will participate – we will keep the BILT posted on its progress
* Per Mercedes’ request, Mark will forward the webinar invite to the BILT attendees on the meeting
* Matt notes that are many portfolio options besides Google Sites
* Mark explains that the idea is that everyone does Google Sites just as a baseline best practice – but if some students want to take the initiative to explore other platforms, they can do so
* Matt shared a review of free website builders: https://www.sitebuilderreport.com/free-website-builders

“Day in the Life” videos
* Requested by 2018 NVC
* Asked for short videos to…
  - Show the reality of IT careers and skills
  - Underscore the value of soft skills
  - Provide advice to students
* These videos would be supplemental to coursework – something the students can watch on their own
* Start scheduling these in January
* Proposed questions and topics – we hope to edit the videos by topic, not person (e.g. one video would show four people addressing the same question)
  - Describe your job duties
  - What are the essential skills required for your job?
  - To you, what’s the difference between technical skills and soft skills?
  - What are the most important soft skills and why?
  - In the last six months, what was your most challenging day?
  - What must students know about the IT workplace?
  - What skills or practices would help someone get hired in IT?
  - What advice would you like to give a current IT student?
* Matt asks how to answer these – he’d be answering them as a CTO but associate’s degree students won’t get a job as a CTO so should the responses be geared to an entry-level slot?
* Mark says the original idea was to allow business people to talk directly to students via videos
Mercedes is a big proponent for giving people a model to shoot for, so for Matt she would ask about his current job but also ask how he got started (i.e. what was his first role in IT?)

Students can then imagine what it would take to become a CTO

Mercedes say we should look at a lot of different roles – motivate, inspire, connect to people who are just starting out; we want them to imagine all of the possibilities

NetApp has a couple of videos she will share with the CTC

Glenn recommends Lucas Figg for one of the videos – if he can’t do it, then someone in his department

Kim will share a career guide with the CTC that addresses these angles – if there’s someone Mark likes, she can maybe connect them

Amy suggests the question: how is the job different than what you expected it to be?

Mark asked for volunteers – we can come to you and make it easy, but there were no volunteers

Amy would like to help but she’s camera shy – would like to maybe do a text version

**Tricider poll responses**

**BILT members, what’s one question you think educators should be asking at today’s meeting?**

>> What are the top three modifications that we can make to the curriculum to “future-proof” our students in a rapidly changing environment?

**Educators, what do you think are the biggest changes facing the education landscape that BILT members may not be aware of?**

>> The severity of the shrinking of community college enrollment and college’s ability to then justify offering low-enrollment, high-skill level courses.

>> It can be difficult to offer "leading edge" courses when the landscape changes very rapidly. I find myself creating courses that are more general (troubleshooting, networking, security, operating systems, server, cloud, IoT). This is from the standpoint of limited enrollment and limited qualified faculty resources.

>> Marketing my program is a huge obstacle.

* From the chatbox: one CCN school suggests having a class called “Emerging Trends in IT.”

* Candy notes that in Texas under new Perkins funding for CTE, they have created partnerships where all programs lead to at least certifications or 2- to 4-year degrees; to go on a list of high-skill, high-demand jobs you can’t list a PhD as a requirement – it must end with a four-year degree

* Candy wonders if reaching back into high school CTE IT programs might be a good idea for community colleges because that’s where your program comes from

* Vincente agrees

* From the chatbox: one CCN school states their biggest competitor is employment – when everyone’s employed, it’s hard to find students

* Matt notes that’s contrarian to the idea that a school can’t create leading edge courses because they don’t have the students; if leading edge courses were created, it could well draw in those employed IT workers to learn new skills

* Rather than just keep it all generic to train generic skills, Matt thinks there needs to also be a balance with the new and emerging technologies

* Matt says for $16-17 you can get a Bluetooth IoT development board and use that in a class as a simple project and get the students thinking creatively and innovating

https://www.ebay.com/i/272788669925?chn=ps&dispctrl=1

For the educators, how do you incorporate teamwork skills and group projects in your classroom?

>> Using a collaborative tool like Slack.
Have students assess multiple dimensions of team members.

All students are assigned to teams and have one project to emulate business teams.

Students are divided into lab groups and they rotate roles each week (director, tech, recorder, materials).

* Mercedes is passionate about teamwork and may want to explore that topic in a future BILT meeting – there’s more to it than tools

* Rick lets his students form teams for the project paper if they want – the coursework is integrated into the paper; he makes it worth 40% the grade; the students have to schedule the work to each other but make sure at the end, the final product has a single voice

* Collin is working on a new alignment between continuing education (CE) and credit with the goal of creating CE courses for what does not fit within a degree

Adjourn

Next meeting is Tuesday February 13, 2019 (8:30am – 10:00am Central)