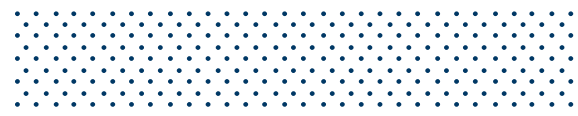**CapTech**

Black Girls Code Advances Lives and Organizations

CAPTECH TRENDS | PODCAST | EPISODE 10

Vinnie

Hello, and welcome to CapTech trends, a place where we meet with thought leaders and subject matter experts to discuss emerging technology design and project methodology. I'm your host, Vinnie Schoenfelder, principal and chief technology officer at CapTech Consulting. Today I'm excited to have a cohost, Mylon Blueford. Mylon is a leader in our diversity and inclusion council with a focus on community involvement, and he's a senior consultant out of our Chicago office. Welcome Mylon.

Mylon

Hey Vinnie. Glad to be here.

Vinnie

Yeah, you guys can't see this because we're not doing a video podcast, but it's the first time I saw a Black Engineers Matter t-shirt and it's great. So, we need to get a bunch of those ordered.

Mylon

I wish you guys could really see this. Like it's definitely, when we fire up the black CRG at CapTech, we're going to have to get shirts like this made for everybody.
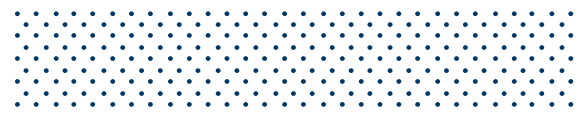
Vinnie

Definitely. I'm excited about today's topic, Black Girls Code, and we're fortunate to have Crystal Harris with us today. Crystal's been a part of Black Girls Code for over six years now and she's a senior manager out of our Philadelphia office. Welcome Crystal.

Crystal

Hi, great to be here.

Vinnie

I know you've spoken about this a lot, and this is a shared passion between us. I mean, we'll get that into a bit of that later, but to start with, why don't you let us know what Black Girls Code is, what the mission is, et cetera.
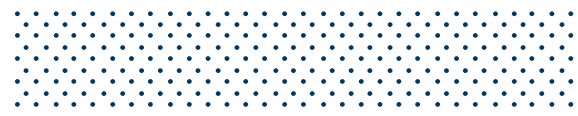
Crystal

So Black Girls Code … their mission to sum it up is to introduce young girls of color to the STEM fields. They target girls age seven all the way up to 17 through workshops, coding camps, field trips to places like Pixar or Microsoft, looking to really close the STEM gap in the industry by getting these girls involved early and keeping them involved and engaged throughout their childhood.

Vinnie

Yeah. And for those of you who don't know, the acronym STEM is science, technology, engineering and math. So yeah, I'm passionate about this as well. I'm on the board at UVA and VCU for their advisory board for computer science. And I'm on the board for Code Virginia, which has a similar mission of getting minority students, rural students, inner city students, female students involved in STEM at an early age. One of the numbers that strikes me, Crystal, is that for black women in college, STEM degrees is 2.9% right now. And that includes biological studies, physical sciences, other engineering. So, you know, the computer science aspect of that is even much lower. I'm curious how you got started, what motivated you and how did you form this passion to join Black Girls Code and help in this way?

Crystal

I got actually involved at a very young age. I had my first experience at nine years old. I was actually in a program for gifted kids and one of the activities was programming in Logo. So, if people remember the eighties, the logo program was basically a turtle, and you gave it commands to basically draw pictures, right? So that's when I learned about fractals. If you're a person who's into math and graphics, you probably like fractals. So that was my first introduction. I would sit for hours on this thing trying to figure out what kind of different patterns and what would happen if I do this or do that. And that sort of started my love for computers in general, I guess. Oddly enough, coming out of that program, I really didn't do much with computers for a number of years after that. It wasn't until I got to my freshman year in high school and there was an elective course on Pascal programming. And I remembered how much fun I had doing this logo programming. And I was like, I'm totally taking this class. It's going to be super fun. And I discovered that I had, you know, a talent for programming and it was something that I really loved. At the time I didn't really know about careers in computer science. I didn't know that that was something that even existed, to be honest. I didn't know anyone who was in computer science. I

didn't see anything about it. No one ever talked to me about it. It wasn't, it was really when I was looking at what was I going to major in, in college and going through that list of things that I realized that computer science was a career and it was a well-paying career. And I was like, hey, I'm pretty good at this thing. I should totally do that. And I ended up taking the AP computer science course. In fact, I was late. It was a year long course and I'd missed the first trimester. I went to the instructor and asked if I did the homework assignments over the Christmas break, would she let me into the class late? So, over Christmas break, my mother works at the University of Pennsylvania, so I had access to a computer lab and I spent a good number of days over my Christmas break in the the computer lab, getting caught up in doing C++ programming. Or I guess it was C back then this was even pre-C++. And that sort of led to me, you know, up at MIT and as a computer science major and entering the industry as a sophomore engineer.
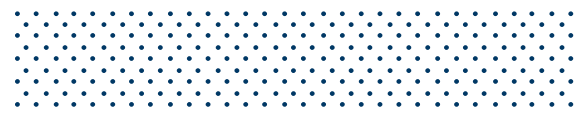
Vinnie

Who did you have back then to ask questions of? I remember I started programming in the eighties as well, and I was 12 and there was no internet. And when you ran into problems, you know, you kind of had to fend for yourself. Did you have a similar experience or did you have someone who could provide those answers?

Crystal

Yeah, I mean, it was in the same boat. I mean, I had, you know, when I was in that class, the instructor of that class was there to provide some guidance, but outside of that, we didn't have a computer in our house. There was nobody I knew who could help with that. Similarly in high school, it was really sort of the same thing outside of that instructor. I didn't really have a lot of support or access. It wasn't until the internet became the internet and I became an adult and I could afford my own stuff that I could that I could get help from people.

Mylon

Hey, quick question, Crystal. I was wondering, as you're going through high school and in your time at MIT studying computer science, were there any other black women that you took computer science courses with, or just any black women professors at MIT or just any other black women that inspired you throughout that journey?
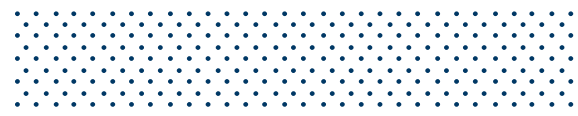
Crystal

No. Oddly enough, I had a freshman advisor who discouraged me from actually taking computer science courses. There's a whole story there around that about the lack of support that you would get. But I was definitely the only black woman and, oftentimes, the only woman in my class. So definitely did not have the sort of support structure and the social support structure around me doing that. It was mostly, you know, white guys who probably didn't quite see me as belonging in that class.

Vinnie

And for those who are super technical and are criticizing Crystal and I right now for saying, we didn't have that. There was no internet. We realize the internet was invented in the late sixties, early seventies, we're talking general access to the worldwide web, you know basic commonality of web access. Crystal you've mentioned two things that I think about a lot when I think about getting kids exposed to computer science. You said getting involved when you were young, feeling excited about it, but also that you didn't necessarily feel like you belonged whether or not people in that room believed you belonged or not in your mind. The way you perceived that is you didn't belong or you didn't fully belong, or they weren't fully inclusive. And in reaching out to you in that way, that to me is sort of the core here because when at UVA and VCU, when we talk about getting more minority students, women students in STEM, it's very difficult to do that at age 18, 19, 20, right? A lot of those beliefs are set. So, it seems to me that reaching out to 12-year-olds or younger even and getting them involved at that age, demystifies it. It lets them know they belong and supports them. What are some of the things that you guys focus on in terms of opening kids' minds to the possibility of this as a field at that age?

Crystal

For me, I think it's a couple of things. I agree part of it is demystifying it. I think people have this picture of people who have programming computers as being magical. And, it's really just problem solving, right? If you can problem solve, then you can code. It really is that simple. And especially now with the broad access to the internet if you don't know how to do something, it's so much easier to get the answer than it was when I was a kid. So, showing these girls that if you don't know the answer, it's so accessible to you, I think is important. I think the other piece is – and one of the things that I love about volunteering with Black Girls Code – is that these girls get to see a different social picture of what it

looks like to be an engineer. And, you know, to combat that, that picture of a 20 something white guy with thick glasses in a basement by himself that engineers are cool. People, engineers are creative people. They're sporty girls and femme girls and gay girls and straight girls and whatever it is, whoever you are, because we all show up and they get to see that diversity of what women, black women in particular, in tech fields look like. They get to see themselves in that and understand that there's a place for them as their whole selves in the workplace.
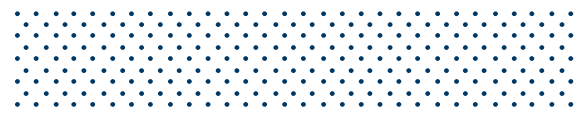
Mylon

Yeah. I just want to piggyback on that just from my own personal experience, you know, I attended the University of Richmond and I was a Division One football player all four years, and I was also a computer science major. And I was, I think, the only football player that was a computer science major. So it was always interesting just seeing people's reactions when I tell them, you know, hey, I'm a football player, but I'm also a computer science major. It was almost hard for them to comprehend that I could have those two shared experiences.

Vinnie

Yeah. There's a lot of bias in computer science and it comes from people who don't really understand it and probably weren't very good at it, but I've been in academic situations, conferences, and I've heard people in leadership positions and this one was actually a woman who said this. She did make the joke about being locked in your basement coding, and that if you're not good at math, you shouldn't be interested in computer science. And that, to me, couldn't be farther from the truth. There's so many things in computer science that are not math related. It's not just about coding. So, I guess the question Crystal is what, what other aspects besides writing code, that Black Girls Code exposes kids to?

Crystal

We do workshops in robotics, they've done some stuff with like electrical engineering; we've even done some stuff where, they haven't actually done it hands on but watching some videos and talking about sort of the idea of like tech and fashion, right? So, this idea, you know, clothes that changed their weave to make them warmer or colder based on the temperature of your body temperature and things like that. And so, this idea of what I like to try and instill in girls is I like to talk to them about, well, what do you want to be when you grow up? Not all of them want to be engineers, right? Some of them want to

be veterinarians, but talking to them about how tech is going to impact their job as a veterinarian or how you can use technology to help you in your career as whatever it is that you want to do. And so, relating that back, and I think that's sort of changing the view of them being able to see themselves when they grow up and how just being tech literate is going to make them a better whatever it is that they want to be.

Mylon

Hmm. And that's interesting because I know earlier, before we, you know, we hopped on this, we were having a conversation about just how technology is so ingrained in everything in society. Like you said, even being a veterinarian, you're going to have to have some type of technical aptitude or experience to do that job well. And it's, and I think that's something that a lot of kids just don't understand, especially, you know, black kids, minority kids, just because they don't see themselves in this industry so much that they don't really understand that anything that they want to do, they can do from a tech perspective.
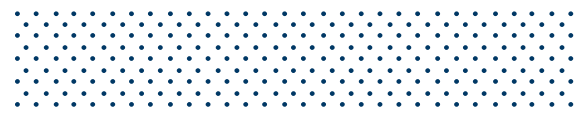
Crystal

Like all the machines that you use as a vet, there was an engineer who designed that and who better to design technology for veterinarians than other veterinarians.

Vinnie

So Crystal, what are some of the other challenges to getting you know, minority students coding? I think of rural students who don't have access to internet. And inner-city kids who don't have access to internet, or they don't have a computer at home. Or if they do, they don't have more than one and other parents are working from home cause of COVID. And it's hard to study online while your parents are working from home. What are these challenges that Black Girls Code comes across? How do you guys help with that?

Crystal

I think one of the really awesome things about Black Girls Code is that they have the funding to provide a lot of their own equipment. So, they'll ship creative laptops and robotics, et cetera, to a location. Usually a lot of the locations are donated space. So, if someone's allowing us to use their office space or their school that has internet access there already. And so, a lot of the girls show up and all they have to
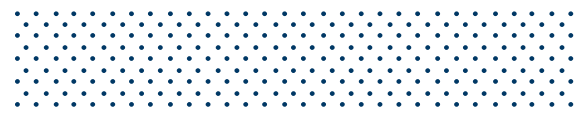
do is show up. I contrast that with other organizations I work with, I also volunteer with tech girls in the Philadelphia area and their workshop model is very much a bring your own device model. They don't have the infrastructure to ship devices out all, all over the place. I see that as a barrier of access to a lot of minority kids whose parents have a computer that they can't just give their kids to take into this class. And so, a lot of the classes I teach are limited to community centers or churches or places that have some kind of a facility where they can put computers in. And a lot of times those computers are old, right? I've done workshops where the computers were so slow that we were trying to do a web-based exercise and it was frustrating for the girls just because pages wouldn't load, right? And that's not a super great introduction to technology. It makes it feel so much harder for them because the technology is in the way or the lack of access to technology is in the way.

Mylon

Yeah. I know in some of my experiences volunteering you know with kids doing an hour of code or any type of coding exercises, some of the computers that we use, were still running on Windows Vista or Windows XP; it's just ridiculous how outdated some of these technologies can be and how impactful that can be in preventing them from getting the access that they need to really engage in these careers and topics. So, real quick, Crystal, I just had another question for you. I know earlier we talked about some of the challenges and hurdles that you faced throughout high school and your time at MIT, just not seeing people like you being discouraged a little bit by some of the people responsible for teaching you - how do you handle that? In your experience of Black Girls Code, are those things that you share with them, how they, if they're presented with those types of situations, how they can best navigate that and keep themselves from being discouraged?

Crystal

That's a good question. We probably don't get as much opportunity to do that as I would, like, I think where I get it most often. And I think where I see it most often is the older girls. The seven- and nine-year-olds, you know, you can't tell them they can't do anything. But it's when they start to get older, you know, 14, 16, 17 years old, that they've now started to internalize a lot of that, the messaging that they've been given about whether or not they're good at it. And so, you'll see the difference in that, and when a seven-year-old, where something's not working, they'll bring you over. And it's, you know, it's a
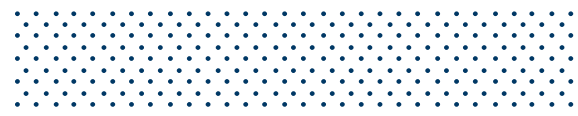
hot mess of all the things that they've tried, right? That you're trying to sort through. I'll come over to a 16-year-old and she's like, "It's not working," and she's deleted the whole thing. And trying to explain to her that the process of debugging is a normal thing. Nobody writes code that works the first time. Like you have to persevere through the code and deleting it and starting over is not the way to do it. It's what you have was probably mostly right. And it's just about fixing it and tweaking it a little bit. But I think it's a confidence thing. It's the seven- to nine-year-olds, when it comes time at the end of the day to present. There's always more girls that want to present than we have time to present; when I get to the older girls, it's like pulling teeth because no one wants to stand up in front of the classroom and share what they've done. And so, I think there's some coaching around how to have a presence of confidence when you're presenting something and speaking in such a way that you expect other people to pay attention to you. We don't get as much into the terrible things that happened to me that might happen to you. I think it's a little bit of like, they'll find out, do I need to tell them? Now they're so enthusiastic. I'd rather come back into the workplace and fix those things then than try and prepare them for dealing with the inequities that exist today.

Vinnie

And just as a followup, I need to talk about, you know, some of the older girls lacking that confidence. Are there specific things that you guys do with Black Girls Code to kind of help them be more competent?

Crystal

Honestly, putting them in that environment with other girls where they get to see that there are other girls that are like them and they have that environment that's supportive. I find like there's definitely a very supportive environment when these girls come in. I see girls come in that have never met each other. They leave best friends and now they have this community of other girls who like computer science too, that they can talk to. I think that's probably the biggest piece is just the accomplishment of I came in, I built something. Every now and then we we bring people in from industry to talk to them about their journeys and they get to see that journey. I think those are all confidence builders for them. I think probably in terms of that presence, giving them a safe space to try that new persona out, I should say is something that's helpful.
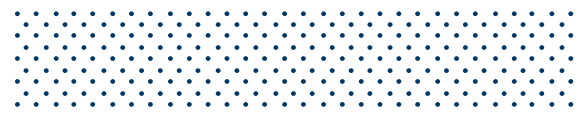
Vinnie

Hey Mylon, Getting into these last two questions of yours. It reminds me that you can tell somebody something or you can demonstrate, right? And so, I think the laboratory of students going through and building things, especially 3D printing, robotics, things you can see that are physical – gosh you're hitting them at the exact right time and they're in their development. If you can get them younger, it builds that confidence and trust for sure. I was also reminded Crystal, when you were talking about no one writes code correctly the first time, I've always thought that computer scientists would make horrible surgeons. You know, we'd have to get through five patients and they've all died. You have to recompile, recompile, recompile - saved one! Right? You know, I don't know another profession where you get to fail multiple times and try crazy things before it finally works. But it's definitely a different mindset.

Mylon

Yeah. That's a really good point. I remember my first time coding, I made the mistake of just writing the entire program out at first and thinking, you know, this is perfect, this is going to run, and hitting the button and it just fails within the first five lines. I have to rethink my entire process. That was a rude awakening to my world of computer science. So Crystal, I know you touched on some of these things earlier and some of the reasons why why you volunteer, why you got involved with Black Girls Code. Are there any other factors that steered you in that direction?

Crystal

I think for me, when I started volunteering with Black Girls Code, I was actively looking for some community involvement and think that I could do that was sort of linked to my passions a little bit. And when I heard about Black Girls Code, I was like, that's the perfect thing for me. I love tech, I can be a great role model for these girls. So, I went to my first event really and started volunteering. And I was hooked after that. Aside from the community impact and sort of doing what I can to make sure that other little girls have opportunities that I didn't have, it is such a fun day to just write code all day. I don't get to do it as much in my everyday work. And so, for me, this is a chance to sort of super nerd out with these girls. They get so excited when something works. It gets me excited, the level of perseverance. Sometimes there's always some girl who's had to persevere through some struggle, whether it be a laptop crash and she lost her whole work and had to redo it over again and, coming out of that, I'm like,
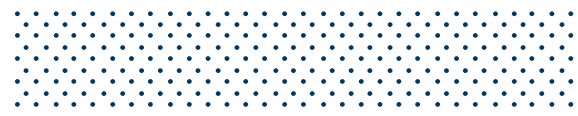
"You know what? I can be better at my job. I can be more resilient in my job. I can be more inclusive in terms of how I support my teammates and putting somebody else's project ahead of mine and being a better servant leader." And then just sort of excited about like the talent that is about to hit, you know, the tech pipeline when you see some of these girls, especially some of them that I've gotten to see in class over the years. And I've been volunteering for six years. So, I've started to see some girls in class over and over again, and you start to see them mature. One of my favorite experiences was getting to teach a class with a girl who was my student the year before and watching her sort of mature from being a student into teaching. Other kids have been sort of a really amazing experience.

Mylon

Yeah. That sounds like it'd be a really amazing experience just seeing that growth coming from probably, as you said, a lot of them being initially shy to the point where she can lead this class with you. That's gotta be an amazing impact. I have another follow-up question; this is just about everything that's going on socially with Black Lives Matter and everything. I'm just curious as to how that intersects with Black Girls Code. I know, you know, the focus is getting these black girls involved and excited about STEM, but at the same time we can't ignore what's going on in the broader world and the things that they have to deal with once they leave you guys. So I was wondering if those are things that you talked to them about to kind of help them cope in a sense with what's going on and even to just show them these are ways that they can use what they've been learning in Black Girls Code to go back into their communities and help.
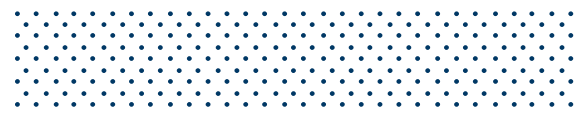
Crystal

We do get to talk to them a little bit about it. Again, a lot of times we have them for a day, right? And then you may or may not see these girls again. But usually where I see that come out most often is during like the two-day hackathons where the girls have some creativity in terms of what they're going to create. And so invariably the girls are looking to solve some problem in their communities. And when they start to talk, you realize that they understand, at a very young age, more than you think they understand. They have a motivation to do something about it. That is incredibly impressive. And, you sort of, when you hear it, you really want to put some money and effort behind supporting them because they have such great ideas about how you can write a mobile app that helps girls who are

getting bullied, right? Figure out, you know, how to feel better about themselves. And, a lot of times the way you get bullied can be very different. I remember there was a group of girls who one of the sources of bullying was hair, right? And so they built this app around finding like natural hair-care solutions and products and things like that for, for other girls who were struggling with how to manage your hair in a world that doesn't necessarily welcome your hair naturally as it grows out of your head. And it's hard to find products that work for people like you. So, I think, you know, they get to talk about it a little bit again. You always want to be a little bit careful because you're not these girls' parents to let them come forward with whatever it is that they want to talk about and then just get behind it and supporting it. I think, beyond that, I think this touches back a little bit to why I volunteer. Because if you think about, you know, where we are right now and in Black Lives Matter and the social inequities that exist right now, and then you think about the fact that we are in the process of automating so many of our social systems and the level of bias and racism that can make its way into that automation. Because, we're not at the table to have a say, and you know, what, maybe you only use that algorithm, or maybe you want to think about testing a little broader than we're testing this, or maybe you want to think about the messaging of who your target audience here is. I think that, if I have any fears about the increase in automation, it's that, that those biases are gonna make their way into systems that are automated machine learning, being a great example of a place where you get nervous about, you know, systemic biases now being programmed in and into how people get loans. For example, if no one's at the table to ask those tough questions, how do we prevent that?

Mylon

Hmm. That's a really interesting point. I know the other day – I've had a lot of conversations with friends – I was talking about technology, especially now talking about how bias can find its way into technology. And the fact that that data in and of itself can be biased. If you're only collecting it a certain way by certain people, then if the data you're collecting is biased then, of course, the end result of your product is inherently going to be biased. I know people assume that AI, artificial intelligence, or machine learning, is conscious in its own way – that it can think for itself – when, in reality, it thinks the way that the person that programmed it thinks. So, of course, if it's being programmed by a group of people that all look the same, then inherently, it's gonna leave people out. So, it's a really great conversation to have.
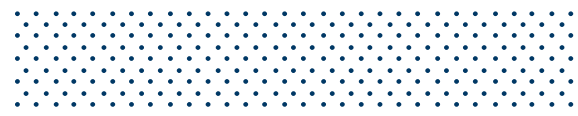
Vinnie

Yeah, certainly Mylon, in a trained machine learning environment, I can totally agree with that. Especially the unconscious bias that that gets introduced. You're unaware of it. There are untrained scenarios that were, you get tons of information and let the code categorize itself, which may have less bias inherently, but then someone has to analyze that data and the bias can be introduced on the backside, right? So, there's bias in the gathering and there's bias in the analytics as well. So, both have to be looked at and, Crystal, that's, I'm glad you brought that point up socially to me. I get into debates with people and I've heard this ever since I was 12, that computers are going to start writing their own code. Automation is going to result in fewer jobs. And certainly that's true in some sectors, but every year we have more and more and more need for more STEM resources. And the companies that I consult with, they can't hire good talent fast enough. So, part of this is economic, making sure that we have a workforce that can meet the demand that we know we're going to have. Some of it's social; it's good. It's making sure that people who are underrepresented in STEM get access. Like they said before, they're high-paying jobs that change the arc of people's lives, and the mile and, to your point, results in better systems. You know, having diversity of thought on the team means that the things you're creating are going to be better and serve people more equally. So, it's kind of like a win, win, win situation, Crystal. So, it's really, really great work. So, kind of wrapping up, Crystal, do you have any final thoughts you wanted to share? Are there ways people can get involved? People get, you know, listening to this podcast, you know, they're kind of feeling like they want to get involved and do more to help. What are some avenues?

Crystal

Certainly. Black Girls Code has has, I think, 16 chapters, 15 chapters across the US so, there's always volunteering through one of those chapters. If you use Lyft, you can actually round up the cost of your ride and it'll donate that to Black Girls Code. Amazon.com allows you to choose Black Girls Code as the nonprofit you want to support. There are a lot of other organizations that are also coded by kids tech, girls who code, if you're looking for other organizations to get involved in, and I will say these organizations, they need non-tech volunteers as well as tech volunteers. So, you don't have to be super technical. Frankly, a lot of times the coding that we're teaching, you know, a nine-year-old, most adults can figure out. I like sometimes for girls to see, you know, that problem-solving process, when you don't

know an answer of how do you go about finding the answer? And I find people who are not deep into code model, that really, well local schools, usually a lot of schools, have STEM programs where they're trying to, especially some programs around girls, where they're trying to give them more support, get them more access. Maybe they need donations for computers. Maybe your local community center is looking for computers so that they can run some programs out of their space. So, I think the opportunities are out there if you're looking for them; it's probably in your backyard somewhere. You just have to reach out to find out where people need help.

Vinnie

Yeah. From an equipment standpoint, most large companies have donation guidelines where when laptops are out of use for coding professionals, they're still great computers for learning environments. And I know they have programs for that. So, if you do work for a large company, you can always see what what partners they already have and maybe introduce potential new partners into those programs.
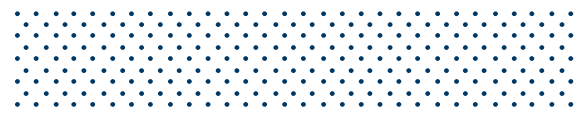
Crystal

Absolutely. Sometimes all people need is a space, right? If you've got great conference room space, donating space for somebody to run a workshop on a weekend in your office space is a great way to support your local community.

Vinnie

Yeah. And I think being aware and realizing that there's a large part of our population that doesn't feel like they have a seat at the table when it comes to STEM, they don't like feeling like they belong in the room. As adults, we can do an awful lot, and just making that as we come across every kid, showing them how exciting and engaging technology can be, as early as we can.

Mylon

One thing I'd like to just add to that. I know, like in my work that I've been doing with the diversity inclusion council here at CapTech, ever since the death of George Floyd and the resurgence of the Black Lives Matter movement, there's definitely been a thirst for people wanting to get involved, wanting to, you know, be a change agent in their communities.

Vinnie

And people may not always be comfortable with protesting and going door-to-door, but this is definitely an avenue for which that they can get involved. And if it aligns with their profession, it's just an easy way for them to make a change in their community, especially a lasting change. If you influence a kid to want to get involved in STEM and they get a nice paying job and it generates generational wealth for their families, it can change the entire course of their history going forward. So, you know, if you're definitely interested in getting involved, this is an amazing way that you can make a change. You know, the discussion on social media is important and it does change mindsets, but actually doing something in the community, getting involved, sitting across from students and being a mentor, that's the way you can make a huge, a huge, impact. So, I want to thank both of you so much for joining us, Crystal and Mylon, it's been great having you on. And thanks everyone for listening and stay tuned for more from us on our next book.

Vinnie

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