Nancy Penchev:

Solar power, we are in a great spot for that. Water, we are right at the Oleta River, right at, we're two miles from the ocean. So could we use something from that? Could we use wind power? So the students started doing a lot of research and found that there are schools who did turn into solar power and then they were able to give their teachers a raise. And I was like, yes, that-

Michael Holtz:

Sign me up for that.

Nancy Penchev:

Yeah, I was like, that's a good idea.

Audio:

This is the ORISE Featurecast. Join host Michael Holtz for conversations with ORISE experts on STEM workforce development, scientific and technical reviews, and the evaluation of radiation exposure and environmental contamination.

You'll also hear from ORISE research program participants and their mentors as they talk about their experiences and how they are helping shape the future of science. Welcome to the ORISE Featurecast.

Michael Holtz:

Welcome to the ORISE Featurecast. As ever, it is me, your host, Michael Holtz, in the communications and marketing department at the Oak Ridge Institute for Science and Education. And as regular listeners to this podcast know I am a huge fan of the Albert Einstein Distinguished Educator Fellowship, and we are launching another series of great interviews. And this time around I have a new podcast cohost, you've met him before, his name is Zachary Proffitt. Zach, welcome back to-

Zachary Proffitt:

Oh man, I'm so... Yes. Thank you. I'm so glad to be here. This is an exciting day. It's a snowy morning in Washington. D.C., like our first snow of the year.

Michael Holtz:

Sweet.

Zachary Proffitt:

It's kind of crazy. So it feels like a cool sort of starting on a new journey-

Michael Holtz:

A good time to start a new journey. I love it.

Zachary Proffitt:

Yes.

Michael Holtz:

So for folks who've listened before, Zach and I have been at the table, the virtual table as it were.

Zachary Proffitt:

Yes.

Michael Holtz:

Together having a conversation to get to know a little bit more about Zach. And this is our first conversation with other members of his Albert Einstein Fellowship cohort. So Zach, who is at the table with us this episode?

Zachary Proffitt:

We have two of the most brilliant people. I mean, you guys are going to meet a lot of brilliant people from this fellowship. And as I said in the last episode, they are all smarter and cooler than I am, and I'm so grateful that they've given up some of their precious time. I know they've been jet-setting around doing amazing fellowship things.

First we have Nancy Penchev, Nancy, why don't you tell us a little bit about yourself, where you are and kind of what your story is.

Nancy Penchev:

Sure. So my name is Nancy Penchev, I'm originally from South Carolina, but I've been living the last 15 years right outside of Miami, Florida. So Washington D.C. is a big change for me, future-wise.

Zachary Proffitt:

Yeah.

Nancy Penchev:

And I don't know that I like that change so much. I am a Capitol Hill fellow, which means I am working in a representative's office. I am with Representative Melanie Stansbury from New Mexico District One. So I get to be in the middle of a lot of action right now. There's a lot of movement, a lot of crazy, a lot of weird stuff. Everything I learned in ninth grade about government is not how-

Zachary Proffitt:

Freshman civics class not paying forward, yeah.

Nancy Penchev:

My first three months, my mentor and I decided that my first three months was going to be a lot of what is government really like, how does this really happen? How does a bill really become a law? And it's not what you saw with the bill singing on the steps-

Zachary Proffitt:

Oh, at Capitol Hill.

Nancy Penchev:

Schoolhouse Rocks is wonderful, but it's a lot more complicated than that. So I have spent a lot of time at the Library of Congress with the Congressional Research Service learning about how all of this works.

Zachary Proffitt:

I love that.

Nancy Penchev:

So yeah, that's what I've been working on and as well as some other cool stuff and meeting a lot of really interesting people and learning a lot of new words and phrases.

Zachary Proffitt:

Yeah. The acronyms.

Nancy Penchev:

There's a lot of acronyms.

Zachary Proffitt:

Yes, there are.

Nancy Penchev:

There's CAO, not to be confused with the COA or the GAO.

Zachary Proffitt:

Yes.

Nancy Penchev:

And the CRS and the LOC, and there's just a lot. So that's what I've been working on is learning more about how all this stuff is.

Zachary Proffitt:

That's beautiful. What a beautiful trajectory for a teacher too, right? Professional learners, right? That we just get to be on the student side again. I mean we always are a little bit, but I think that's awesome. It's great to have you, Nancy.

And then our other fellow who's here on the agency side. So as Nancy mentioned, she's a Hill fellow, is Charles. Charles, why don't you give us a little bit of your intro. Welcome. We're glad to have you.

Charles Wang:

Thanks. I'm glad to be here. Hi, I'm Charles Wang. I was born and raised in Galveston, Texas. If you don't not know what that is, that's Houston. And if you don't know where Houston is, that's where NASA Johnson Space Center is. That's Houston, we have a problem.

Zachary Proffitt:

There it is.

Michael Holtz:

There it is.

Charles Wang:

And I'm currently, as Zach said, placed in an agency, specifically the CISA, Cybersecurity and Infrastructure Agency. But if I really want to be more specific, I'm in the K-12 team in the academic engagement branch within, there's so many of these. Nancy was talking about acronyms.

Zachary Proffitt:

Yes.

Charles Wang:

Strategic Relations, Stakeholder Engagement division, all of that stuff. And I come back into this position with a lot of experience teaching computer science and cybersecurity, and that's kind of the avenue I'm able to then my educator expertise.

Zachary Proffitt:

Awesome. Yeah, and that's the other side. The other big learning curve is not just the acronyms, but also the hierarchy, the layers to these things.

Michael Holtz:

Absolutely.

Zachary Proffitt:

It's the most complex parfait you've ever had in your life, right? It's just endless layers to agencies and agencies. In Galveston, do you guys also say, we've got a problem or is there no problems in Galveston?

Charles Wang:

Well, in Galveston, we have problems come in the form of hurricanes.

Zachary Proffitt:

Shipwreck kinds. Not rocket ship problems, but that's good. You're far enough away from Houston for all that to get away from that.

Charles Wang:

Yeah.

Zachary Proffitt:

Good.

Michael Holtz:

So, Nancy and Charles, first question, what is it about the Albert Einstein Fellowship that drew you to apply?

Nancy Penchev:

Well, I had been looking at it for years. At one point, it was a two-year program, and I had looked at it at that point and I was like, how do you get out for two years and then go back and what if they don't keep your job? And so I really didn't know how that would work. And so I just kept saying, no, no.

And then two years ago I did a Fulbright to Vietnam Distinguished Awards and Teaching Research and spent three months in Vietnam learning how they use educational technology or don't use educational technology in their classrooms. And at that point I was like, you know what? I like learning, I like exploring more things. And my friend David did it in 2020 and he was with NASA and he was like, "You really need to do this. You really need to do this." I kept going, "Leave me alone. Leave me alone." I finally said, "Okay, I'll do it. I'll fill it out."

And then last year, Denise, who was a fellow last year, was a fellow, she's from South Carolina, and we had known each other through a lot of organizations and stuff. So I was like, maybe I should try this, maybe I should not... So I just filled it out to get David to leave me alone, and I was like, there's no way I'll get it.

Zachary Proffitt:

Right.

Nancy Penchev:

And then I did, and then I was like, oh, now I got to go. So yeah, I have an insatiable thirst. I want to learn more. I never know enough. So this was just another way to learn more. And I have definitely learned a lot. And I always tell my students, we can do hard things. Things are never going to be just breezy easy. We need to push ourselves. So if I'm constantly telling them, push yourself, do more, then I need to model that as well. So I am trying to be an example of we can do hard things.

Zachary Proffitt:

You're living it, man, yeah. And you're also coming from a small private school, right?

Nancy Penchev:

Yes.

Zachary Proffitt:

So you have a lot-

Nancy Penchev:

It's not small-

Zachary Proffitt:

You're a big... Okay, so it's a big private school. But yeah, yeah.

Nancy Penchev:

Yes. I am from Scheck Hillel Community School in North Miami Beach, Florida. We are probably a little over 1,200 students right now. We are literally busting at the seams. There's no more room. We have teachers who are doubled up in classrooms in elementary school. It's a wonderful place. They've really encouraged me to learn and to grow and to find out more and to just be who I am because STEM teachers are a little weird sometimes we're not-

Zachary Proffitt:

Sure. Yeah, see a lot of quirks.

Nancy Penchev:

[inaudible 00:08:59] person.

Zachary Proffitt:

Sure.

Nancy Penchev:

And I'm like, "But what if they don't like me?" And my chief academic officer who has been there the same amount of time, we came in literally the same day for orientation and work together. And he's like, "It's okay. It's okay. You could be who you are."

Zachary Proffitt:

There you go.

Nancy Penchev:

And he has encouraged me to grow and to go out and do more. And so that's what I'm doing. I'm trying to grow and model that growth for students and for my fellow teachers as well.

Zachary Proffitt:

I love it.

Michael Holtz:

Awesome.

Zachary Proffitt:

I love it. I mean, that fits so well with such a rapidly advancing area in education, like technology, right? So I mean, you're trying to keep ahead of that wave, right? That curve just moves so fast.

Nancy Penchev:

There's no way to stay ahead of it. You're just try not to drown.

Zachary Proffitt:

No. Yeah, absolutely. Absolutely.

Michael Holtz:

Ride the wave.

Zachary Proffitt:

Yes. Ride it. Charles, how are you riding the wave these days?

Charles Wang:

I am riding currently the AI wave, but there's been so many waves over the years. There was crypto, there was cyber, which is still a wave, but these waves, they continually appear year after year after year.

Zachary Proffitt:

Yeah, the only consistent thing is change, right?

Charles Wang:

Right.

Zachary Proffitt:

It feels that way. Sorry, I cut you off. Did you want to respond to Michael's question? How did you come to the fellowship? What was enticing about it?

Charles Wang:

Oh yeah. So I had never heard of the fellowship until two months before it was the deadline. So fast-forward or backtrack a little bit, the deadline was November 2023.

Michael Holtz:

Okay.

Charles Wang:

And I heard about it from the parent of a former student of mine who happened to be a district administrator of sorts.

Zachary Proffitt:

All right.

Charles Wang:

And she had heard that from her kid that I was thinking about taking a year-long sabbatical, my wife and I, to travel the world. And so we caught up and she sent me an email the day after we talked and she was like, "I'm so happy for you, but if your plans change, consider this fellowship."

Zachary Proffitt:

Yeah.

Charles Wang:

And that's the first time I heard about that fellowship. I looked at that link, I read all about it, and then I talked about it with my wife that night and she was like, "Yeah, I'm down. If you want, we could postpone this year long trip around the world." And so that was when I started my application and it was a long application, let's say that.

Zachary Proffitt:

It is, it is.

Charles Wang:

Three recommendation letters, I managed to get them pretty quickly, but the essays, they took me a while to really sit down, think about what I've done throughout my teaching career and really put it to paper, I guess all my accomplishments, what I've done and what I hope to do. But yeah, so because of COVID my wife and I were celebrating our honeymoon a little bit later. So as we were in line going to board the plane, I hit submit on my application.

Michael Holtz:

Oh my God.

Zachary Proffitt:

There you go.

Charles Wang:

And as I was in the air, the deadline passed.

Zachary Proffitt:

Oh gosh.

Charles Wang:

That's how close I cut it.

Zachary Proffitt:

Nice, nice. You spent a lot of time it sounds like. Sounds like you developed a pretty robust, probably better than my application, I...

Charles Wang:

Yeah. I had a rough draft ready to go three weeks before.

Zachary Proffitt:

There you go. There you go.

Charles Wang:

It was a lot of revising, editing.

Zachary Proffitt:

Proper drafting. That's important, right? I never would've made it had I not had people review and made that a collaborative experience.

Charles Wang:

Exactly.

Zachary Proffitt:

That's awesome. Well, we're so glad to have you all here. We're trying to take sort of a slant to this episode and talk about education, technology in the classroom, technology in STEM. And you are both exceptional experts coming from very different environments and now immersed in very different ways in that technology sphere, ecosphere, where we're sort of used to be on that user side, right? And now we're figuring out how does technology get to the users or how does technology get to students, how does it get to school districts? How do we implement all these tools? And so we're excited to tap into your experience about that.

Michael, anything else you want to know about these wonderful people? Is there anything cool that you guys would like to share with the population about you that maybe people don't know? Are you guys master rock climbers or chess grandmasters or something like that?

Michael Holtz:

Surfers, whatever.

Zachary Proffitt:

Surfers. Yeah. Do you like to bake?

Nancy Penchev:

No.

Zachary Proffitt:

Nah.

Michael Holtz:

No.

Zachary Proffitt:

I love it.

Nancy Penchev:

No, baking is a science, right? I can cook, I make stuff, but I just throw stuff together. But with baking, you have to be exact in your measurements.

Zachary Proffitt:

It really does feel that way, doesn't it?

Nancy Penchev:

I'm not the exact kind of person. My grandmothers are, both of my grandmothers, amazing cooks and they just throw a pinch of this and a little bit of that.

Michael Holtz:

Right. And it's perfect and beautiful and delicious.

Zachary Proffitt:

Right.

Nancy Penchev:

Yes. And never made it the same way.

Zachary Proffitt:

Oh my gosh.

Nancy Penchev:

How do I make this ham? And she's telling me the whole time. And I'm like, but I did exactly what you said.

Michael Holtz:

It doesn't taste like that.

Zachary Proffitt:

It can't.

Nancy Penchev:

I can't even make her sweet tea. I'm like, "Tell me exactly how many cups of sugar, exactly-"

Zachary Proffitt:

Right.

Nancy Penchev:

And I watch her and I go home and do it, and it's still not the same. I'm like, whatever. Whatever.

Michael Holtz:

I know. My grandmother and my mother-in-law would say it's the love, and I think that's true. I think there's whatever that is.

Nancy Penchev:

I don't have it.

Michael Holtz:

You can follow the recipe exactly, but whatever that thing is that they... Yeah, you can't replicate if you're not them. I don't know why, but.

Nancy Penchev:

My sister can do it, not me. I can't do it-

Zachary Proffitt:

Yeah. Some people have the spice, right? Some people just got it. I think also though, I know when I'm going to grandma's house, right, I'm going to just not eat for a little while, I get real hungry, right? So I'm just going to wait.

Michael Holtz:

We are having this conversation days before Thanksgiving.

Zachary Proffitt:

Yeah, it's appropriate. It's awfully appropriate.

Michael Holtz:

My mother-in-law has made the best pumpkin pie I've ever had in my life. And pumpkin pie is pumpkin pie, but hers and she passed away a couple of months ago and in addition to missing her, that pumpkin pie will never be the same.

Zachary Proffitt:

Yes. It can't. It can't be the same.

Michael Holtz:

Family members have been like, "Do you want me to bake a pumpkin pie?" I'm like, "Nah."

Zachary Proffitt:

Yeah.

Nancy Penchev:

Nah, yeah. My grandmother, my mom's mom made a chocolate pie. It was a chocolate pudding that she would put into a pie crust and nobody's ever been able to make it since. And after the first year, I'm like, don't even try. Just don't. I mean, yours is fine. It's fine. There's nothing wrong with it. But it's not it's-

Michael Holtz:

It's not. Yeah.

Nancy Penchev:

It's not.

Zachary Proffitt:

It's the secret. It's the secret, man. I don't know, it's some sort of magic. I was doing a recipe the other day and I had this, it was this sort of audio app where I had this recipe that I wanted to do and I had put it into this app and it was reading out loud the instructions, and so I can just say, "Hey, can you give me the next step," or whatever. And it was telling me... It was like, "Put the onions in and then saute them and then wait 10 minutes." But then at the end it was like, "Bake, set your oven, turn your oven on to 400 to bake it." I was like, "Man, I should have done that 10 steps ago." It's like, this is exactly like when I cook with my grandma. She's just doing all this stuff automatically and then you're trying to write it all down. It's so hard

Nancy Penchev:

That's the perfect metaphor for technology and how it works and doesn't-

Zachary Proffitt:

I know. We're trying, we're trying, we're trying.

Nancy Penchev:

... always work for you, you know?

Zachary Proffitt:

I know. I know. Did y'all, I mean, I imagine y'all use technology all the time When you're in the classroom, how often would you say you used it, every day?

Nancy Penchev:

I'm a special teacher, specialist.

Zachary Proffitt:

Sure.

Nancy Penchev:

So kids come to me at different times twice a week.

Zachary Proffitt:

Yeah, yeah.

Nancy Penchev:

So I did use it every day because I didn't necessarily see the same kids every day.

Michael Holtz:

Okay.

Zachary Proffitt:

That's true. That's true.

Nancy Penchev:

If it was when I was just in the regular classroom, I mean, using a smart board is technology, so yes.

Michael Holtz:

That's true.

Nancy Penchev:

So I would use it every day. But as far as having students hands-on, I wouldn't necessarily have it every day, but I also teach robotics and I teach movie-making and I teach all kinds of, you know, podcasting, I teach that kind of stuff. So it's heavy on the technology part.

Michael Holtz:

Right.

Nancy Penchev:

A lot of different coding things. And so it's heavy on that for elementary school. So I do use it quite a bit, but not necessarily all the time. Sometimes during our chemistry unit, we never pick up a computer just because it's not safe to put everything near the computer.

Zachary Proffitt:

That's true.

Nancy Penchev:

So there are times where it's just hands-on and no tech. And then there are times where we use tech and during my Maker units, at first, when I first started doing Maker, I wouldn't let the kids use technology at all. I'm like, "Nope, you got the cardboard, you got this, you got this." And some kids are just more comfortable with the technology and they would rather make a movie about what they've learned rather than making something with their hands. And so finally I went, okay.

Zachary Proffitt:

Yeah, it's really opened up the modality.

Nancy Penchev:

It has to be a balance though. You can't spend all day long for a kid on the computer. I have spent more time sitting in front of a computer during the fellowship and it's not good for my eyes and it's not good for my back.

Zachary Proffitt:

Prescriptions changing.

Nancy Penchev:

I have to take my walk, I'm like, I'll pop up every once in a while and just walk out of my office-

Zachary Proffitt:

Get some sunshine.

Nancy Penchev:

... and go walk around the square that's in the federal building there in our building. And I'm like, I'll just walk around and then go to the bathroom and I'll come back in and sit down again for a little bit because you can't be healthy and be on a screen all the time.

Michael Holtz:

Absolutely.

Zachary Proffitt:

Yeah. It's one of the beautiful parts of teaching is you get those breaks all the time. You're able to move even if just around your classroom pretty consistently. Or by necessity, right?

Michael Holtz:

Charles, what about you with?

Charles Wang:

I agree with Nancy. She was saying as a teacher you use technology every day, every class period. If you want to take attendance, you have to use the software. If you want... I mean, we now use learning management systems and there are maybe five of them that everyone uses throughout the nation. And also the two classes I taught were computer science and cybersecurity.

Zachary Proffitt:

Right.

Charles Wang:

And [inaudible 00:19:48] might think that we use technology every day, but I actually tried not to. Like Nancy was saying, you try not to use technology every single class period, day in, day out. And I think there's this idea that because it's computer science, you're in front of a computer programming every single minute, every single hour. But in my personal opinion, there are some things about computer science such as developing algorithms that I personally really, really think pencil paper is better and more suitable for it rather than jumping straight into the programming aspect.

Zachary Proffitt:

Yeah. They get a whole different kind of logic, right? So as a science teacher, even when you're trying to work on an algorithm, giving them some sort of visual or giving them... There's this big thing in whiteboarding, right? Like this whole building [inaudible 00:20:39]-

Charles Wang:

Right, exactly.

Zachary Proffitt:

... classrooms piece, right? In the math classrooms. It's like there's a whole different, at least for me, but I'm older than my kids by several decades. There is this idea for me that when I hold something or I have a tactile version of it, it becomes much more real and then all of a sudden the code starts to make a lot more sense. My logic flow, my outputs, everything starts to reason well, once I've sort of set it in front of me and whether it's blocks or just handwriting or it's manipulables, it seems to click a little bit better for my kids too. I don't know. Did you find that? What kinds of other kinds of things did you do?

Charles Wang:

Exactly like you were saying, you get an overall bigger picture and you're not absorbed in the minutia of getting the exact programming syntax correct. And that really helps you focus on the, like you said, overall logic of the program, right?

Michael Holtz:

Right.

Nancy Penchev:

Yeah, right now, because kids have been inundated with technology so much since the pandemic.

Zachary Proffitt:

They're so fluent.

Nancy Penchev:

And parents don't want them on computers anymore and teachers are like, more, more.

Zachary Proffitt:

Yeah.

Nancy Penchev:

Yeah, me too. Our code is coming up, so I've developed some offline hour of code activity for my school back home in Florida because they were like, "Can you make something that's not using a computer?" So I did some offline coding stuff and I'm pushing it out to my New Mexico stuff as well.

Zachary Proffitt:

Oh, that's awesome.

Nancy Penchev:

I made it with a New Mexico theme since I was like, "Hey, I'm doing this while I'm working on-"

Zachary Proffitt:

Yeah, why not?

Nancy Penchev:

"... New Mexico, let me make it with a theme."

Michael Holtz:

Right. Absolutely.

Nancy Penchev:

But you can do anything yourself that you choose, but just to get kids off of a device. Because coding is basically, what I boil it down to, because I do it from kindergarten and sometimes with the babies as well, because my school is EC through 12th grade, so I have little ones coming in and it's a direction You can follow directions.

Michael Holtz:

Right.

Nancy Penchev:

If I say stand up and you stand up, then you're following a direction. But if for a code, if I wave my hands like a choir director and you stand up, that's a code. So breaking it down to that small thing, so offline and building it from there and having the kids become the robot or the computer, there's more to coding than just using a device. Now I love the devices, we use the devices all the time for it, but there's more to it that you can do with kids that can get them away and disconnected for a little while.

Zachary Proffitt:

Isn't that magical though? I used to do Hour of Code 10 years ago when it was first coming out and we were struggling to develop the computer science class, put it in, and then, because at that point my school, it wasn't one to one, we had the carts and so you had to organize time in the library. And now just a decade, we're doing the opposite. We're like, kids are on there... We're doing too much code. Let's pull them out, right? It's like the hour of un-coding, right? It's kind of a cool perspective shift, you think about how much has changed in just that short amount of time.

Michael Holtz:

Well, and to Nancy's point about headaches and just the physical health aspect of screen time and then you add the mental health, we all need to step away from our screens.

Zachary Proffitt:

Sometimes, yes.

Michael Holtz:

Sometimes. Because we spend so much time, and the pandemic certainly brought that to light, but even I've learned for myself as, I'm a writer, so I spend a lot of time in front of a screen and I also work in public, so I need to understand what's going on with the news. And of course, Nancy, in the world that you're in, we've just come through this-

Zachary Proffitt:

Beyond the Hill.

Michael Holtz:

Political season that we're still. In and I had to step away just to be like, I'm not doom scrolling. I'm not-

Zachary Proffitt:

It's just too much, yeah.

Michael Holtz:

The world is... And so I picked up hobbies that I wasn't... Because I was like, I can't spend this much time on a screen. It's going to kill me.

Zachary Proffitt:

Yeah. It's awesome.

Nancy Penchev:

Then you have multiple screens. I have my phone, my personal phone, and then I have my office phone, and then I have my computer sitting in front of me when I'm at the office or my laptop when I'm at home and I'm like... So I'm checking everything all the time.

Michael Holtz:

Right.

Nancy Penchev:

Something's beeping and something's going on. You have to disconnect sometimes. And so I've started taking notes on paper and I detest my handwriting now because it's not as good as it used to be.

Michael Holtz:

Same.

Nancy Penchev:

But I have a whole list of things right now that I'm going to work on after this that I wrote down all of my ideas instead of, normally I would create a Google Doc and I would type it all out, but this time I wrote it on paper just to take myself away for a little bit, give my eyes that rest and my brain that rest because you can't be healthy and stuck at a computer all the time.

Michael Holtz:

Yep.

Charles Wang:

Nancy, are you turning into Beth writing things down?

Nancy Penchev:

I know.

Zachary Proffitt:

Oh, on a hard calendar? No way.

Nancy Penchev:

Yeah. I have not managed to keep a paper calendar, that I don't do. But I have started taking a lot of notes because... On paper just because with two phones, I don't know where I did it at, and then I have my Google and then I have my office Microsoft, and I'm like, where did I do that? Where did I put that?

Michael Holtz:

Which file does that document live in? Yeah.

Nancy Penchev:

Just a piece of paper. Write it down and then I'll find it later and do it.

Charles Wang:

My friend who's really into ergonomics says 20, 20, 20. Every 20 minutes, you stare at something 20 meters away for 20 seconds and that's supposed to help your eye strain a lot. And so that's something I'm trying to do. And going to what Michael was saying, I picked up a hobby of doing pottery, ceramics about-

Zachary Proffitt:

Oh. That's great.

Charles Wang:

... two or three weeks ago. And I think it's a really, really good counterpoint too, because I'm a programmer, I teach computer science. It's really nice to do something physical versus to kind of counterbalance that computer science.

Zachary Proffitt:

That's dope. What kind of stuff have you made? Yeah, have you made anything? Have you made any cool pots or mugs and stuff?

Charles Wang:

Yeah, you follow me on Instagram you can see-

Zachary Proffitt:

Oh, that's right, yeah. That is dope. So cool.

Michael Holtz:

Cool.

Zachary Proffitt:

Charles has a sick Instagram. Lots of you all have great socials.

Michael Holtz:

All right, so Charles, what's your Instagram so people can go check it out?

Zachary Proffitt:

Yeah, plug it. Plug it.

Charles Wang:

My Instagram is on private, but if you do want to follow me, it's charles.d.wang, and it's W-A-N-G, charles.d.wang.

Michael Holtz:

All right.

Zachary Proffitt:

See all the ceramic goodness.

Michael Holtz:

I love it.

Zachary Proffitt:

You're going to be on the Great British, what's that...

Charles Wang:

The baking show?

Zachary Proffitt:

The Pottery Throw Down?

Charles Wang:

Oh yes.

Zachary Proffitt:

Yeah, the Pottery Throw Down is good.

Charles Wang:

I'm not that good.

Zachary Proffitt:

You will. One day.

Michael Holtz:

Oh, is that a show? I need to check that out.

Zachary Proffitt:

It is. It's a good time.

Nancy Penchev:

I didn't know about that one either. I got the British Bake-Off one, that one I love.

Michael Holtz:

Absolutely. I love that.

Zachary Proffitt:

It's very wholesome. It's very wholesome.

Michael Holtz:

Cool.

Zachary Proffitt:

And along the same vein.

Michael Holtz:

Charles, being at CISA and we've talked a little bit about AI, there's two sides of the AI coin that you hear a lot about is on the one hand, it's great, it's going to help us with our productivity. And on the other hand you hear it's going to steal my job. And so AI is important. It's not going anywhere. I guess, how do we live in a world where AI clearly is... And I know we use it every day. We use it when we MapQuest or Google Maps or-

Charles Wang:

Grammarly, anything, yeah.

Michael Holtz:

It's all around us, so it's already part of our existence. From a security and all of that perspective, what do we need to be concerned about?

Charles Wang:

Wow.

Michael Holtz:

Or how do we make it useful? Take any of that, because I know that's a huge, like...

Charles Wang:

Yeah, how much time do I have?

Zachary Proffitt:

Yeah, you actually had such a wonderful post the other day about this, talking about how the role of student data in these AI tools that are designed for education, right? And what's the way to be correct stewards of that information, right? I think you have a great perspective.

Charles Wang:

Within these past two or three years, there are so many AI tools that really just utilize ChatGPT or some other large language model. And a lot of times these are really fastly... Really developed very fast and they don't have a lot of privacy security controls in them. At least they're not... Sorry, at least they're not baked into them. And so what we're seeing is that a lot of times these, how should I put it? I would say they require... They need a lot more openness in terms of how they actually work, what they're trained on, and what are the pitfalls of using them.

Zachary Proffitt:

Sure.

Charles Wang:

For example, I think I was reading this other article by Harvard Business Review about people just... They're trying to put AI into everything, into pharmaceutical recommendations, into recommendations for doctors. And they're finding what we're talking about in the current media is hallucinations. Basically they're just making things up and the way they're trained and the way they're developed, you can't really, at least currently, get away from that a hundred percent.

So the way I like to think of it is don't blindly trust AI. Don't blindly trust any technology. Really think of it as an assistive tool and allow it to assist you in what you're currently trying to do, at least in terms of AI and the educational classroom.

In terms of job workforce, I don't know how much expertise I can lend to that question, but I think that jobs, certain types of jobs are being lost. They are being replaced by these AI, if not models, but robots. And I think that throughout time, throughout history, if you look back, you'll see that technology has advanced, certain job types are no longer needed, but other jobs do appear and they are needed.

Now, I don't think there's going to be a one-to-one correlation where you lose 10,000 jobs in this one type and you get 10,000 jobs this other type, I honestly cannot predict that. I don't know about any research that looks at that. But I do know that jobs will disappear and other jobs will appear, and it's how can we skill up the workforce to be prepared to take advantage of those new jobs.

But at the same time, you have older folk who might have a harder time being re-skilled, and that's just something as a society we have to discuss, we have to wrestle with what do we value and what can we do.

Zachary Proffitt:

Yeah, it's one of the hardest parts of higher ed, right? One of the toughest challenges I think that they're facing right now is, like we were talking about at the beginning of the episode, this wave is moving and it's getting faster. It's growing in momentum and so a traditional four-year path to a new degree or to a new cert, or to a new job is really what it ends up in. Somebody makes a transition to a new field, sometimes you go in now at four years and the job you wanted at the start doesn't even exist at the end. And you're like, oh wait, I can't be a true programmer hardly anymore. Nobody's going in for app design anymore. Whereas four years ago, everybody that was graduating from high school was like, "I want to go into app design or app dev," because everything's uncoded.

And so now you've got to be an AI or ML engineer, but if you jump into that pool now, right? Just I think it's an interesting discussion to have about what is higher ed in that sort of job-specific training or education. How does that grapple with this pace at which skill development is-

Charles Wang:

[inaudible 00:33:09].

Nancy Penchev:

But this is not new. This is nothing new, because my dad was a mechanic growing up. My dad's 82, 83 now, so he was a mechanic. And then computers got put in cars and when computers got put in cars, he was already in his 50s, 60s, and he was like, "I can't do that."

My mom worked on an assembly line at a manufacturing plant from the time she was 17 until she was 63. When they put in computers just for her to clock in and just for her to key in when she was finished with a certain thing, they had an order number, she had to key it in. She was like, "I got to find a different job. I can never do this." She finally figured out how to do it and she kept working and it was fine, but it ended my dad and he would then just do the tire changes and they really kept him on because people said if he was there, they trusted him. People have a hard time trusting mechanics, but they trusted him. And so if he was there, then people would be like, "Okay, is he there then? Is Edgar there?" And they're like, "Yeah." So they would bring their car in even if he didn't touch it, I think as long as he was-

Michael Holtz:

He was there.

Nancy Penchev:

But technology changes everything, so this is not something new. But with AI, something else we have to think about is this effect on the environment because these big data centers, this is something that my office, I didn't even realize that until I started working in my office. And it's something that they're looking at too. The big data centers, every time you are searching within, prompting within AI, it's using a lot of energy and it's also the heat that it overheats and it uses so much water. And some places where these data centers are like in New Mexico, water is a hot commodity, there's not a lot of it. So that's something that not everybody knows that they don't correlate it with the environment, if I'm using AI. So that's something that you just don't think about.

Zachary Proffitt:

Or just the internet in general.

Nancy Penchev:

I had never thought about it until I sat and talked with my team members and they were talking about some of the things that they were looking at.

Zachary Proffitt:

Yeah, because I mean AI is available to everyone, right? And those data centers are geographically relevant to only a small subset of the population. We see a ton of them in Northern Virginia, right? They're all over, and so people are thinking about them, like, how does this property... What do we do with this property that... Or how do we offset the electricity?

I think there's some... It's just so electrically intensive and in a time when we're talking about how do we use less, how do we be smarter with our resources? How do we make sure our planet is going to be alive? How do we make sure we can prepare and stabilize our grid for that? It's a really complex issue, I agree.

But it's also... So few people see it relative to how many people use it, right? And I think that's another part of it being difficult to tackle. But I don't know. I don't know. Have you guys ever... When you guys teach, say about the environment or resource use or something like that, or in your school, Nancy, do you guys ever talk about the electricity that goes into computers or the elements that go into computers or how these things are manufactured as a depleting, or as a finite resource?

Nancy Penchev:

We haven't covered it from that perspective. In fourth grade, one of our standards is looking at electricity and how much we use. And one of the things that we did was we went to our operations and I was like, "Hey, how much money do we spend on electricity?" And our school, it's a pretty big campus and it was a lot of money.

And so I took that back to my students. I'm like, "Look how much money we're spending. Let's do the math on this." And even in the summertime, if we're not in school, they're still camp going on, so we're still using it during that time. And I was like, what could we do? So they started doing their research and they learned about solar power. We are in a great spot for that. Water, we are right at the Oleta River, right at, we're two miles from the ocean, so could we use something from that? Could we use wind power? So the students started doing a lot of research and found that there are schools who did turn into solar power and then they were able to give their teachers a raise. And I was like, yes, that is real.

Michael Holtz:

Sign me up for that.

Nancy Penchev:

Yeah. I was like, that's a good idea. But then you have to-

Charles Wang:

[inaudible 00:37:41] Nancy.

Nancy Penchev:

... look at the weight, the weight of those solar panels and our buildings are older, most of them. So is it going to be too much weight and-

Zachary Proffitt:

Are you going to spread out or go up, yeah.

Nancy Penchev:

Yeah. So the kids really took that on and they've worked on that for a couple of different years and the one year we'll take the last year's research and start narrowing down more things and figuring out more stuff. So it's been really interesting to watch and see their thinking and what they come up with and just trying to build with them and trying to figure that out.

Zachary Proffitt:

That's such a great authentic-

Nancy Penchev:

Because they come up with ideas, I had no idea. I didn't come up with a teacher's pay part, but I was like, I'll take it.

Zachary Proffitt:

That's a great authentic learning experience for kids too.

Michael Holtz:

Let's go to the board of directors with this.

Zachary Proffitt:

Yeah.

Nancy Penchev:

And they did. They made videos and we sent them to our board and we sent them to our head of school for them to look at and they got feedback on their work. So it's real authentic learning there.

Michael Holtz:

And I love that it built on, like, the work from the second year built on the work-

Zachary Proffitt:

Yeah. Longitudinal, it's beautiful.

Michael Holtz:

That's really cool.

Zachary Proffitt:

Have you guys seen the solar farms out there that they have sheep or goats that just keep the grass down?

Michael Holtz:

Seriously?

Zachary Proffitt:

Yeah. So they have... They're like a farming solar combo. They have all these sheep-

Nancy Penchev:

I just saw that. I just saw-

Zachary Proffitt:

Yeah, they're so cool.

Nancy Penchev:

I just saw on Instagram the other day, a video of them moving the goats.

Zachary Proffitt:

Yes. It's crazy now.

Nancy Penchev:

[inaudible 00:39:15] big ol' goats in South Carolina. We have big goats.

Zachary Proffitt:

I love that. That's such a cool-

Nancy Penchev:

And yeah, we saw they are moving the goats, and they had the dog there. There's a dog that stays with them and they had a llama that was protecting the goats from whatever. It was so interesting, yeah.

Zachary Proffitt:

Dude, they're honoring llamas. Never mess with them. Never mess with them.

Nancy Penchev:

No, thank you.

Charles Wang:

Speaking about the earlier question about looking at AI in terms of the electricity use.

Michael Holtz:

Yeah.

Charles Wang:

We don't look at it in terms of the electricity use, but we do look at it in terms of the implications and the applications of AI machine learning. There's a reading assignment that my students do, and this originated during COVID when I think it was Stanford, they employed an AI model to recommend who should get the vaccine first.

Zachary Proffitt:

Sure.

Charles Wang:

And during that time it turned out that, oh, they were recommending these remote employees before frontline doctors, frontline nurses. And so that's when I made this reading assignment. And over the years I add onto it with Amazon hiring determination, other, what do you call it? There was one about inmates being jailed, how AI models do that.

Zachary Proffitt:

Sure.

Charles Wang:

But it really gives students a different perspective about the actual implications if they do decide to fully trust and just leave all of the decision-making to an AI model.

Zachary Proffitt:

Yes. Unassisted.

Charles Wang:

Also talks about the data set, how the AI model reflects the data set it's trained on, so it's going to have bias discrimination if the data set is not a good one.

Zachary Proffitt:

Yeah. You almost need some sort of risk scale. I've also heard of them doing things like using large data sets to figure out people who are eligible or ineligible for benefits, right? And it's just like that's a very different type of decision to allow an unassisted decision to be made than recommending a course for college or suggesting a next video, right? There's a whole different tier, but in essence, you're doing the same thing. You're saying let's put a bunch of data into a box and then let's see what it gives us as a recommendation, right?

And far too little is done in the data validation step, the post-decision decision-making process, it seems to me, right, that we need to really bolster that with our students in terms of how we talk about algorithmic thinking in that... The building algorithm is fun and it's fun learning the logic and it's fun implementing the code, but it's really so much more valuable when you know how to validate what's happening afterwards.

Charles Wang:

And one thing I really like about OpenAI, which they created ChatGPT, but OpenAI, they actually release these data sets, or not data sets exactly, but they release their tests that they conduct on their data sets, their models and show what is at high risk, what is at low risk. And that's kind of where I'm a little iffy with some tech companies like Khanmigo, the AI tutor, they aren't public, they aren't transparent at all with what exactly their model is trained on and with what their model struggles with and they just don't release that information.

Zachary Proffitt:

Interesting. We really do need some of that visibility in the education space, right? To be able to make robust use of it in order to be able to be faithful with implementing these tools with our kids or at the school level. We really want to make sure that we know how it's all going in and coming out, right?

Nancy Penchev:

And what they're doing with the data that they get.

Zachary Proffitt:

Yeah. Yeah, yeah, yeah.

Nancy Penchev:

Because they're learning from us as we're using it, what are they doing with that?

Zachary Proffitt:

Do you guys have a favorite tool? Do you have one that you're... I know, Nancy, you're a huge Padlet fan, right?

Nancy Penchev:

Yes. I adore Padlet. I've been a big proponent of Padlet for many years and not just for the AI part, but just because I teach four fifth grade classes, right? And one class will never see what the other class sees unless we post it for them to see. So Padlet has been the greatest way that we have of sharing our work with each other and then with families as well. And I adore Padlet. They are just... I've met the founder of Padlet many times.

Zachary Proffitt:

Oh, that's cool.

Nancy Penchev:

At conferences because I present on them a lot. So he would come in... And he came to meet me the first time and then he's come to my sessions before to just hang out and see what I'm doing.

Michael Holtz:

Cool.

Nancy Penchev:

But our kids love it. At one point, we used it for our summer reading, our summer learning program. So the kids each got their own Padlet account and they would post a book that they read. They would draw a picture of the characters, they would find three ways that math was in their life, just different things like that. They had to do two good deeds and help other people, so they'd post about that, and then they shared it. And that was when they came back to school, that's how they spent the first week or two in their classes getting to know each other by sharing the Padlet and they would present their Padlet and it was the best. I had nobody who complained about it, because sometimes you bring your summer project in and it just goes in the trash.

Zachary Proffitt:

Sometimes. Yeah, absolutely.

Nancy Penchev:

And it was the best thing. They would introduce themselves to their new teachers, they would introduce themselves to their class and stuff, and it was phenomenal.

Zachary Proffitt:

Such a good collaborative tool. Yeah. I wish more places would use Padlet. I see it all over in the ed space and I love it. And I never see it in other places.

Nancy Penchev:

My favorite AI tool that I use a lot with my students and the name of it just left my brain. So I'll think about that.

Zachary Proffitt:

We'll circle back.

Nancy Penchev:

[inaudible 00:45:31] in a second.

Zachary Proffitt:

Yeah.

Nancy Penchev:

Oh, good grief.

Zachary Proffitt:

It happens.

Nancy Penchev:

I'll think about it.

Zachary Proffitt:

Yeah, yeah. No worries. No worries. Charles, what about you? Any favorite tools? Any shout-outs you want to give out? That you have?

Charles Wang:

Generically my favorite tool is YouTube. I think there's so many great things that you can find on YouTube.

Nancy Penchev:

Yes.

Charles Wang:

Like social engineering videos, physics experiments that I could not conduct in my classroom because it's a little unsafe, but I can turn to, let's say, Dr. Tatiana from A&M and watch her conduct them. For physics, there's something called PhET Simulations.

Zachary Proffitt:

Oh yes.

Nancy Penchev:

Yes.

Charles Wang:

Which are a little bit more ideal environments that don't have wind resistance or friction.

Zachary Proffitt:

Yeah.

Charles Wang:

But at the same time, I think in-person physical physics experiments are the gold standard because you have that error that is real life.

Zachary Proffitt:

Yeah.

Charles Wang:

And then computer science-wise, GitHub, they're a version control software.

Nancy Penchev:

Yes.

Charles Wang:

They're bought by Microsoft and it's really adding a real-life component. Students can interact with real code sets, with real databases that other people have published.

Zachary Proffitt:

And they publish how-to guides, they publish a lot of other ancillary materials with their code.

Charles Wang:

Exactly.

Zachary Proffitt:

Yeah. It's so great.

Charles Wang:

And they can publish their own work on there and other people can favorite it. It's really awesome.

Michael Holtz:

I love it.

Zachary Proffitt:

Yeah. And that really... That's the true scientific cycle.

Nancy Penchev:

So I found my tool.

Zachary Proffitt:

Yeah, what is it? What is it?

Nancy Penchev:

I have a Padlet with all of the AI tools and-

Zachary Proffitt:

Ay-yo. Inception.

Nancy Penchev:

I do a lot of collections on pilot, so it's Diffit. Now, Diffit-

Zachary Proffitt:

Oh, yes.

Nancy Penchev:

Yeah. It will create for you content, reading content or if you have like a PDF or a YouTube video, you can put that in and it will put in whatever it says, right? It'll create questions for it.

But the best thing about it for me last year was I had students who were moving in with zero English, and I don't speak Hebrew, I don't speak Spanish, I don't speak... A little bit of Spanish. But everybody who was coming in, I couldn't communicate and I can't always rely on the student in my class who is translating and helping them. So Diffit, it translates material. So I could create material for my class and on any grade level and then translate it within Diffit and then I gave it to the ESOL teachers and they were checking, like, "That's pretty good."

So I would be able to give the same information to everybody on what level or what language that they needed. And then it also has a lot of great different activity things that they develop as well. But just having that information in every language so that kids are all on the same playing field was tremendous for me.

Zachary Proffitt:

Yeah, it's so cool. And you can differentiate it so fluidly. It's just really an exceptional... A great tool. And that didn't come out... That came out very recently. That's like a year old or less. Or something like that.

Nancy Penchev:

Yes, it's not very old. And on Facebook they have... The founders of Diffit have a Facebook group and they're constantly saying, "Hey, we're looking at doing this. Who wants to try it out for us?" And so they're taking teacher feedback all the time and putting it together so that everybody is contributing and they're just pretty amazing with what they're doing.

Michael Holtz:

That sounds really cool.

Charles Wang:

Wow. That sounds like an amazing tool.

Zachary Proffitt:

It is. It's real good.

Charles Wang:

I'm getting flashbacks to 2017.

Zachary Proffitt:

Say what?

Charles Wang:

I'm getting a flashback to 2017, when I had one period of integrated physics and chemistry, I had five Spanish students, only spoke Spanish, one Arabic student and one Romanian student.

Michael Holtz:

Oh my gosh.

Charles Wang:

They only spoke that language. And I would Google Translate worksheets for them into their language. I mean, Diffit would've saved me so much time.

Nancy Penchev:

That alone, if it did nothing else, that alone was such a bonus for me because I have 500 students in a week. I don't know what to do when I have seven of them that I can't communicate with. And the ESOL teacher can't be with all of them all the time. So that just gave me so much of a, "It's okay, I can do this."

Zachary Proffitt:

Yeah.

Nancy Penchev:

And the kids knew exactly what we were doing, but they couldn't express it to me. So when I was able to translate for them, they were like, "Yeah, I know this. We did this." And they were able to add to it. So it was just the best.

Michael Holtz:

That's cool.

Zachary Proffitt:

I have to shout out, there's a great program that we've sort of been part of for about five years. I don't remember exactly how long. It feels like it's been a long time. It's called Positive... It started out as what's called Positive Physics now it's called Positive STEM. It's made by a former teacher from named Jack Replinger, he's just a total legend. I totally dorked out when I saw him at NSDA a couple of years ago. I took a selfie with him and stuff.

But one of the cool parts about being a part of... Basically what Positive Physics is, is a sandbox of practice and prep questions in all different fields of STEM, and they're all standards aligned. And you can build your own course, you can design your own questions. But what's great about it's, it does a really good job integrating with LMSs. It does a great job... It's got multiple languages, it's got video tutorials, it's got all these great glossaries.

And so I taught an integrated science course, which was teaching four different sciences at the same time. And so sometimes I would have to assign chemistry and physics or earth science and research or something like that. So you had a bunch of different types of practice that kids were wanting to make sure they were staying up to date. And they have just done a brilliant job developing the tool. It's a web-based tool, so anybody can access it as long as they have a mobile or laptop. It's really highly recommend. Positivephysics.org, I think it's also Positive STEM will take you there. Huge fan of that.

Michael Holtz:

Awesome.

Zachary Proffitt:

Michael, any writing tools, any tech writing tools you're a big fan of?

Michael Holtz:

Honestly, I haven't... I use my brain, honestly.

Zachary Proffitt:

That's a powerful one.

Charles Wang:

That's the best one.

Zachary Proffitt:

Top tier.

Michael Holtz:

Not because I'm.... Although I will say I have used ChatGPT to start a thought. I'm thinking about something, but I don't rely on AI to write a whole... If I were writing a story about this conversation, I would parse through the transcript and pick the highlights of what we've talked about, that sort of thing. But I wouldn't say rely on AI to write a whole piece for me just because I don't trust it. And I've seen people use it who... AI will pop in words that aren't everyday conversation. And I've seen people write a couple of pieces and that same word is in every one, and I'm like, you didn't write that, did you?

Zachary Proffitt:

They're using the word lugubrious very often.

Charles Wang:

Exactly.

Michael Holtz:

And it was a word like that. You would not hear every day. And it was like, that's an interesting... Or dearth.

Zachary Proffitt:

Yeah, yeah, yeah, yeah. It's like Old English in some ways. It's funny how you can kind of notice that language over time.

Michael Holtz:

Right, exactly.

Zachary Proffitt:

I feel like I can recognize when I'm having a conversation with someone, whereas maybe in the early days of chatbotting, you were like, is this a person or is it not a person? Now it feels like I can really get it.

Michael Holtz:

And everyone uses this, but Canva for design is a...

Zachary Proffitt:

Oh, my gosh.

Nancy Penchev:

That's [inaudible 00:53:52] favorite.

Zachary Proffitt:

I think the art is one of the most amazing, and I know it comes with a lot of hindrances and a lot of concerns about intellectual property and people's likeness and all that. But I think that the art has been so transformative in terms of being able to generate an image specifically for a particular niche circumstance that somebody else might not have.

Michael Holtz:

I need an alligator with Christmas tree lights and-

Zachary Proffitt:

Yes. Me too. I didn't realize nobody else needed that.

Nancy Penchev:

Well, you could just go to Florida and take a picture of it.

Zachary Proffitt:

I heard.

Michael Holtz:

True.

Nancy Penchev:

I'm pretty sure somebody's got it in real life.

Michael Holtz:

I was just in Key Largo, so that's entirely possible.

Zachary Proffitt:

I love it. I love it.

Michael Holtz:

So Nancy and Charles, are there specific projects that you're working on right now or something that you've completed? I know it's still early days in your fellowship, but something that you're working on or something that you completed that you can tell us about?

Nancy Penchev:

So I work in the New Mexico office. So I went to visit New Mexico because I'd never been there.

Michael Holtz:

Cool.

Nancy Penchev:

And I was able to go out for the last day of Balloon Fiesta, which is phenomenal.

Zachary Proffitt:

Gorgeous.

Nancy Penchev:

It's hot air balloons in Albuquerque, and it was amazing. And then the end of the week I was able to go to the New Mexico Science Teacher Conference. And one of the things that I've been working on is, because I got to have a little teacher action going on.

Zachary Proffitt:

Of course, of course.

Nancy Penchev:

Because I can't just do government stuff all the time. So I developed some literacy connections. So some books that you could... Fiction and nonfiction that you can use within your classroom, no matter what grade level you're teaching. Even if you teach high school, they will sit still and listen if you read them a children's book. And then-

Zachary Proffitt:

They love being read to. You're so right. Yeah. You're so right.

Nancy Penchev:

Yeah. And then you can take that book and then jump it into STEAM activities. And then I also did some STEAMy connections. So different places like the Balloon Fiesta or the Isotopes baseball game or the caverns that you can visit there or the petroglyphs. So I took different places in New Mexico and did STEAMy connections with it.

So if you go to an aquarium, here are some science things, some technology things you could look at. Engineering, arts, math, and then here's some things you could do. And now they're for New Mexico places.

Michael Holtz:

sure.

Nancy Penchev:

But literally if you go to any aquarium, it's going to be the same kind of idea. Now, every baseball is not going to have the Isotopes in the name, so that one part maybe not-

Michael Holtz:

Right.

Nancy Penchev:

[inaudible 00:56:40] can be translated. And the whole baseball one came up because we went to a baseball game as fellows, and I went back again with one of our other fellows, Ralph, who's a math teacher, and he was talking about the different math things going on. And I'm like, "You're ruining my baseball game."

Zachary Proffitt:

Hit me with all the statistics.

Nancy Penchev:

But in reality, looking at the measurement on the field and the angle and different things that, of course I know, but I don't know, right?

Zachary Proffitt:

Right.

Nancy Penchev:

I hadn't really thought about as far as a connection to learning. So I just wrote up a bunch of different activities and I'm giving them out at different places that I go, different organizations that I've been able to work with. Some of the museums and things that I went to while I was there, I was able to send them some stuff. White Sands National Park, I have three pages of ideas for them, so I sent it to them. And then I am giving it out to teachers. So I just went to NSTA...

Zachary Proffitt:

New Orleans, right?

Nancy Penchev:

Yes. That was last week, I think.

Zachary Proffitt:

Yeah. Hole in one.

Nancy Penchev:

I was there, and I actually met a New Mexico teacher there, but other teachers as well. So I was sharing the different literacy connections and the STEAMy connections and stuff with them going... And it's all free, it's on my website, nancypenchev.com.

Zachary Proffitt:

I was going to say, you got to share.

Michael Holtz:

Shout out.

Nancy Penchev:

Yeah. Anybody can go there and get them and download it and use it however you would like. And there's tons of things on my website that... For literacy, for STEM, robotics, all kind of stuff that people can just take and use however. Because if I go to the process of making it for something, I don't want it just to sit there and never be used again. I want people to use my stuff.

Michael Holtz:

Sure.

Nancy Penchev:

Some people are like, "No, you can't have my slides." I'm like, "Please take my slides and use them. Use them with your kids. Use them with other teachers, however you use this." So yeah, I was there, and it's just... My representative, Representative Stansbury was a STEM teacher before she got into politics.

Michael Holtz:

Okay.

Charles Wang:

Awesome.

Nancy Penchev:

My legislative director, Lauren, was a STEM teacher before she got into politics. And there's a lot of teachers on Capitol Hill that have now moved into government.

Zachary Proffitt:

Awesome.

Nancy Penchev:

So it's really cool to be able to make those connections to New Mexico, to everywhere. And it's just been a lot of fun. And now I'm working on... I'm researching right now looking at national teacher certification possibilities.

Zachary Proffitt:

Oh. For STEM certs?

Nancy Penchev:

Mm-hmm.

Zachary Proffitt:

That's awesome.

Nancy Penchev:

And if not everybody, then for especially military spouses. Military spouses, the number one job of a military spouse is education. And every time they move, every two to three years, a military spouse moves, they have to get a new certificate in their new location.

Michael Holtz:

Right.

Zachary Proffitt:

If they change states, right? Yeah.

Nancy Penchev:

My cousin just did this because she's a military spouse and it was a thousand dollars.

Zachary Proffitt:

That's wild.

Nancy Penchev:

And in between all of the transcripts, the fingerprints, the certificate, all of the different things that she had to get sent in, it was over a thousand dollars, and there has to be a way. Now, there are some things for military spouses that have just come out, but if we had something so that they didn't have to do that every time.

Zachary Proffitt:

That would be awesome.

Michael Holtz:

Right. Because it's not like members of the military are getting rich, right?

Zachary Proffitt:

Right, right, right. It'd be nice.

Nancy Penchev:

Oh, yeah, yep. And they're doing it all the time. They have moved... I think they've been in maybe 17, 18 years and this is number eight move, I believe.

Michael Holtz:

Wow.

Nancy Penchev:

So that's a lot.

Michael Holtz:

That's a lot. That's a lot.

Nancy Penchev:

Mm-hmm.

Zachary Proffitt:

Oh, and y'all should check out, Nancy's got great pictures from the balloon fest on her Instagram too. She's like pretty excellent, yeah.

Nancy Penchev:

That was crazy amazing.

Zachary Proffitt:

Yeah. Really beautiful.

Nancy Penchev:

It was just incredible.

Zachary Proffitt:

I've always wanted to go. That sounds like so much fun.

Nancy Penchev:

You definitely should. Everybody should go at least once. Now, you're going to be cold and you're going to have to get up at 4:00 in the morning to get out there.

Zachary Proffitt:

Eew.

Nancy Penchev:

But it's so worth it. So worth it.

Michael Holtz:

Podcast [inaudible 01:00:39] field trip, Zach. I'm seeing it.

Zachary Proffitt:

Yes. Somehow. I'm all about it, right? Road trip, Route 66, all the way.

Michael Holtz:

Charles, how about you? Project that you're working on or something you've completed?

Charles Wang:

Yeah. So something CISA's really big on is this idea of growing the cyber security workforce and growing the cyber skills of everyone. So we always... Well, right now the number is 500,000 jobs in the cyber security field that we're trying to fill up. But at the same time, we know that besides these 500,000 jobs, everyone needs to know cyber principles, like good cyber hygiene, making good password, not your birthday, not your address.

Nancy Penchev:

Not password.

Charles Wang:

Exactly.

Michael Holtz:

1, 2, 3, 4,

Charles Wang:

Or making sure you update your web browser, right? If you look in the top right, some of you might-

Zachary Proffitt:

Needs to update.

Charles Wang:

... need to update that browser.

Zachary Proffitt:

Right, yeah. Everybody collectively just went...

Michael Holtz:

You what?

Zachary Proffitt:

Looked up to the right.

Charles Wang:

Right. So it's these general principles and ideas that we're trying to get to everyone. So one project that I'm working on is how can we integrate cyber security education into every single class and make it easy for teachers to drop something here, there, kind of as a warm-up of the day.

Zachary Proffitt:

Suer.

Charles Wang:

We want to make it easy for any teacher to use and we don't want it to be a standalone cyber security class. Because right now very, very little school districts are even-

Zachary Proffitt:

Teaching.

Charles Wang:

... offer that.

Zachary Proffitt:

Yeah, yeah.

Charles Wang:

So that's kind of where we're looking at right now and what I'm kind working on.

Zachary Proffitt:

I think that's such an interesting part about computer science because in the school district in which I used to work, based on what school you were in, they would... Taking computer science was a different kind of class. So some schools would code it as a science class, others would count it as a math elective, right? There's also the CTE pathway, so, so many different ways you get the same kind of experience, but not everybody gets it, right? And so it's really important, I think, as a form of, like you said, safety, general safety for people going forward. They should be exposed to those principles. Think it's cool to put it in other classes.

Nancy Penchev:

I read too that they were counting coding as a foreign language.

Zachary Proffitt:

Yeah.

Nancy Penchev:

Because they were counting it as language, so they were counting coding as a foreign language, which I thought was interesting.

Zachary Proffitt:

It is.

Michael Holtz:

Interesting.

Charles Wang:

Yeah. I think it depends on a state. I know in Texas, because that's the state I'm from, some universities accepted the programming as a foreign language. Some didn't.

Zachary Proffitt:

Oh, that's wild. That's so cool.

Charles Wang:

So I had some pushback from my counselors in terms of marketing this course as counting as a foreign language.

Michael Holtz:

Interesting.

Zachary Proffitt:

Yeah. Charles, what do you think about making a fifth core, making computer science a fifth core subject? Or are you more of a proponent of embedding computer science in all the other four cores?

Charles Wang:

I think if you make it a core subject, you're going to take away from something else.

Zachary Proffitt:

Yeah, that's true.

Charles Wang:

And I'm also a big, big proponent of the arts. I took orchestra all... Some of the years. That is the highlight of my K through 12 career.

Zachary Proffitt:

Were you violin or what did you play?

Charles Wang:

Interesting question. I played everything, really.

Zachary Proffitt:

Oh, wow.

Nancy Penchev:

Cool.

Charles Wang:

Sixth grade violin, seventh grade bass, 11th grade... Ninth grade violin again, 11th grade viola, 12th grade, I took two orchestra classes and also did cello.

Michael Holtz:

Oh my God.

Zachary Proffitt:

Cello is the best one. Absolutely.

Charles Wang:

I think so. My sister is actually in college right now studying cello.

Zachary Proffitt:

That's beautiful.

Michael Holtz:

Amazing.

Nancy Penchev:

Cool.

Charles Wang:

Yeah. But I think computer science is important. I don't know to what extent everyone needs to learn how deep they need to go into computer science, but I think they need to understand general computer science principles such as algorithmic thinking, but I don't think they need to necessarily take multiple years of computer science.

Michael Holtz:

Gotcha.

Zachary Proffitt:

Yeah.

Nancy Penchev:

We do it as everybody's not going to become a coder, but everybody needs to learn problem solving.

Zachary Proffitt:

Yeah.

Nancy Penchev:

And so a lot of coding is problem solving.

Michael Holtz:

Sure.

Zachary Proffitt:

Modern logic, right?

Nancy Penchev:

That was one of our things when we first started adding coding into our elementary school curriculum, was that not everybody's going to go to that field.

Zachary Proffitt:

You all use it.

Nancy Penchev:

But everybody is going to have to communicate. Everybody's going to have to use critical thinking skills, so we're not going to do it all the time, but you need those same skills, so.

Zachary Proffitt:

Yeah.

Michael Holtz:

Right.

Zachary Proffitt:

I love it. I think those are wise... Sage sentiments coming.

Michael Holtz:

So Zach, I know you're co-hosting, but what are you working on?

Zachary Proffitt:

What am I working on? Podcasting. No, I'm kidding. That's it.

Charles Wang:

Doing a great job.

Zachary Proffitt:

Thanks. Thanks. It's so much fun. The last couple of days I've been working, we were at a meeting with the lab education directors for all of the national labs working on their education programming. So within the Department of Energy, each of the labs have the opportunity to host K-12 teachers and students in various ways. And so they devised just incredible programming stuff that I wish when I was a new teacher, I would've gotten, I mean, it's all this quantum... A lot of it's programming based, a lot of it's just... But really robust, amazing science professional development. And it's all targeted. This is sort of this new chapter of K-12 engagement from the Department of Energy.

So last couple of days we've been spent working with these lab education directors talking about how to improve the programming, what it looks like, how we're going forward, how to plan, how to... Making sure... There's been some turnover in the department as well, so we're trying to onboard all these new education directors, make sure they understand and don't get too overwhelmed because that's a big job for a lot of these places. Some of these places are hosting more than a thousand students and teachers per year through various different funding sources, through various different localities. And so it's a really big job, but it's really inspiring to see how capable these people are. So I'm really excited to get out and see some of that stuff happen.

Michael Holtz:

Awesome.

Zachary Proffitt:

In action. Yeah.

Michael Holtz:

That sounds great. So I know we could have this conversation for hours.

Zachary Proffitt:

I know. It happened so fast.

Charles Wang:

Round two next week, right?

Michael Holtz:

Exactly. The conversation continues. And we could do our own show with just the four of us for sure. That would be a lot of fun. But I want to wrap things up and my favorite question to end any show with is the following, so this is for everyone. What brings you joy? And Nancy, I'll start with you.

Nancy Penchev:

I think my family brings me joy. My husband, I talk to him multiple times every day. He comes out and back to Washington and to Florida with me. I have... My mom is one of five and my dad is one of nine, so I have a huge family.

Zachary Proffitt:

Oh, wow.

Nancy Penchev:

And the kids in my family are my first line of trying everything. So when I wanted to make a pumpkin explode, I went home and I grabbed the kids in my family and we tried it.

Zachary Proffitt:

Tried it out. Yeah.

Nancy Penchev:

I think having those kids around a lot, and there's a lot of them, there's a whole lot of them. And we have a brand new one that's only a couple months old, all the way up to the oldest is now graduated from high school of that generation, of my next generation. And so just spending time with them and talking to them, they'll call me, they'll text me or we'll video chat or they'll send me something or I'll send them something and they'll open a box on their porch and like, "Did you send this?" I'm like, "I don't know. Where did it come from?"

Zachary Proffitt:

I can neither confirm nor deny.

Michael Holtz:

I love it.

Nancy Penchev:

Having those kids and seeing their joy, that's what it does for me. And I don't buy them toys for birthdays or for Christmas or anything. They get learning experiences.

Michael Holtz:

Nice.

Nancy Penchev:

So seeing what they're interested in, talking to them and spending time with them is the greatest thing.

Zachary Proffitt:

They do really appreciate it.

Nancy Penchev:

And then my parents as well. My dad's 83, my mom's 80 this year, and I call them every single day and we video chat. And when I went to Vietnam, I chose Vietnam because my dad had been in Vietnam during the war.

Michael Holtz:

Okay.

Nancy Penchev:

And I wanted a positive experience for him. So we would video chat every other day and I would show him, I went back to where he was stationed in Pleiku, and I showed him, he's like, "That's not what it looked like." I'm like, "No, because that was like 60 years ago."

Zachary Proffitt:

I imagine.

Michael Holtz:

Right, right.

Zachary Proffitt:

I'm glad, yeah.

Nancy Penchev:

But my family really does keep me in a head space where I can work, I can see bad things, I can see good things, and I can come back and I can fill up that...

Zachary Proffitt:

Yeah. You know they're always there.

Nancy Penchev:

[inaudible 01:10:10] fill in your bucket, right?

Zachary Proffitt:

Yes.

Michael Holtz:

Yeah.

Nancy Penchev:

It's a bucket filler. So that's my bucket filler is spending time with my family. And then my students, because I have a family here right now who's in D.C. touring, and I get to go and meet them tomorrow, and I'm so excited.

Zachary Proffitt:

That's awesome.

Nancy Penchev:

And a few weeks ago, our whole eighth grade was here and they were coming into the Capitol, and I walk around the corner and I go, "Hey." And they're like, "What?"

Charles Wang:

Wow.

Nancy Penchev:

And so I surprised them and it was fabulous. And then I went home and I was able to go into the school and see everybody. So those learning moments and those connections.

Michael Holtz:

Yeah.

Nancy Penchev:

Family, friends, I call them my students and my grand students, my students who've had children by this point, because this is year 27 for me.

Michael Holtz:

Oh my God.

Nancy Penchev:

So having those connections that matter to me, that people I can talk to and reach out to, and people that reach out to me, I think that's what brings me joy.

Michael Holtz:

I love it.

Nancy Penchev:

Not the cold weather, not the cold weather.

Michael Holtz:

Not the cold weather.

Zachary Proffitt:

That's my joy.

Michael Holtz:

That's right.

Zachary Proffitt:

Yeah. Today, that's mine.

Michael Holtz:

Yeah.

Zachary Proffitt:

The snow, man. It's beautiful. Charles, what about you, man? What lights you up?

Charles Wang:

Yeah, speaking about cold weather. Right now, in this moment, what's bringing me joy is making it back to the DMV area. I got home at 1:00 this morning, flight cancellation because of this cold weather, airline had no more flights, had to get re-booked on different airline.

Michael Holtz:

Oh my gosh.

Charles Wang:

That left six hours later. Then as I was sharing before, I had a sprint down to Chicago Airport.

Zachary Proffitt:

Yep.

Charles Wang:

The few were in the Chicago airport at 8:30 PM last night-

Zachary Proffitt:

He was committing. Yeah.

Charles Wang:

Was also running.

Zachary Proffitt:

Yeah.

Charles Wang:

Probably me.

Zachary Proffitt:

Yeah. Conveniently not sweaty at all, right? He has been running, it could have been a marathon and Charles just looking like it came out of the shower.

Charles Wang:

But more generally, what brings me joy, like Nancy was saying, is really family and friends. There's a group of friends that I've been doing fantasy football with since we graduated high school.

Michael Holtz:

Cool.

Charles Wang:

Same league. We've all been in this, competing some with better win records than others, of course.

Zachary Proffitt:

Sure, sure.

Charles Wang:

And then every Tuesday or so, we try to play Baldur's Gate 3 together, a group of friends.

Zachary Proffitt:

That's a great game.

Charles Wang:

And we have a wait list of friends who want to visit during the Cherry blossom season.

Zachary Proffitt:

Oh, nice.

Charles Wang:

They're going to stay with us. Excited for that.

Zachary Proffitt:

Them and everybody else. Yeah.

Charles Wang:

Right.

Zachary Proffitt:

Get ready for it. That's going to be great. Michael, what about you? What's bringing you joy?

Michael Holtz:

So as I mentioned, I was in Key Largo actually last week, so my wife and I got to spend a week away, which we hadn't been able to do for a long time because her mom was ill and all of that. And so my wife, and memories of a week in Key Largo and Southern Florida, we took a day down to Key West and toured Ernest Hemingway's home and saw the Six Toed Cats, and...

Nancy Penchev:

I have one.

Michael Holtz:

Do you really?

Nancy Penchev:

Yes, I do. Kiko, my cat has six toes. I was like, look at that.

Michael Holtz:

Love it. And hung out where Ernest Hemingway did and just had a great time. And the resort that we stayed at, the end of every day, they celebrate eventide. And so as the sun is going down, first of all, you can buy a drink that is served in a pineapple, which is amazing.

Zachary Proffitt:

Ah. Very important for eventide.

Michael Holtz:

Cocktail in a pineapple. And then they have this table and they have a roll of butcher paper, and on the butcher paper, you're invited to write things that you're letting go of, hopes and aspirations, whatever. And they have two barrels at the end of their dock area, and they start fires and you can throw your papers into the barrels.

Zachary Proffitt:

That's really cool.

Michael Holtz:

Yeah. So as the sun is going down, you sort of give your cares to the sea. And it's just really impactful.

Zachary Proffitt:

I was going to say, your shoulders look very light today. You've just... All the weight of the world is off of them, yeah.

Michael Holtz:

Let a lot go.

Zachary Proffitt:

Yeah, yeah, yeah, yeah. That's awesome. What a cool ceremony.

Michael Holtz:

Yeah, it was really... And it was every night. And then on Fridays and Saturdays, actually, one of the guys on staff takes a cauldron out into the middle of the bay. And so he, on a stand-up paddleboard, pulls the... Instead of it just being at the end of the dock, he pulls it out into the bay. And so it's just really an amazing experience. So we had a great week, and I'm still riding the joy of that week connecting with Sarah.

Zachary Proffitt:

Good.

Michael Holtz:

Zach, how about you?

Zachary Proffitt:

Strong counterpoint to Nancy's cold weather fears here at this. The first snowy day of the year is one of my favorite moments. My son and I just-

Nancy Penchev:

Is it really snowing. Wait a minute. Really?

Zachary Proffitt:

Well, I'm a little north of D.C., but yeah, it's actually snowing.

Nancy Penchev:

I haven't looked outside today yet.

Zachary Proffitt:

Yeah. So just big, super-

Nancy Penchev:

I thought you were kidding.

Zachary Proffitt:

No, for real, for real flurries.

Michael Holtz:

Nancy's going to be freaking out.

Zachary Proffitt:

Yep. Yep.

Nancy Penchev:

I got to put on seven more layers and go outside.

Zachary Proffitt:

Yeah. I hope y'all are getting some of it. It's not snicking, but it's at least coming down, so we've always look forward to that.

Michael Holtz:

Nice.

Zachary Proffitt:

Huge fan. Yeah.

Nancy Penchev:

Cool.

Michael Holtz:

Cool. Well, Nancy and Charles, thank you so much for joining us for this conversation. It has been amazing. And like I said, we could continue this conversation for a long time. And maybe closer to the end of your fellowship-

Zachary Proffitt:

We'll hopefully-

Michael Holtz:

... we'll have you back.

Zachary Proffitt:

We'll have you all back, yeah. That'd be so fun.

Michael Holtz:

Key takeaways from your experience and that sort of thing. So thank you for being here. And Zach, it's been-

Zachary Proffitt:

Always a joy.

Michael Holtz:

Joy-

Zachary Proffitt:

Every time. This is part of my joy too. Yeah.

Michael Holtz:

Co-hosting this with you. It's been a lot of fun today. So thank you so much. And everyone have a great rest of your day.

Zachary Proffitt:

Yeah, stay warm.

Audio:

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