Liz Wolfe Episode

Kara: Joining us today is Liz Wolfe-Eberly from the Dayton Regional STEM center. Hi Liz!

Liz: Hi Kara. How are you?

Kara: Good. So, first off, I want to know, I know that you had an interesting job before you ever became a teacher. So, I'm curious how your journey led you to the regional STEM center?

Liz: So the interesting job that has nothing to do with education is that, yes, at one point in time, I was actually a flight attendant. It was a very short-lived career, mostly based in my twenties off of this idea that it would be a great way to just get to travel around. Turns out it was really hard work and not what I wanted to do with the rest of my life, but I had some really great times doing some flights.

I actually had to go to the Cayman Islands out of that, which was really cool. And I ended up working for the airline for a while. And one of the things that ended up happening was that I had grown up in a family of educators, both of my parents being teachers as I was growing up and other family members being administrators in education.

So, originally my idea was that I was going to do anything except teach. I was not going to be a teacher. When I started working, kind of in that more business side originally as a flight attendant and then working on the business side for the airline, I just really kind of missed something in my life.

Feeling like I was making the difference in the lives of other people and that led me to go back and get an additional licensure to become a teacher. All my other work in undergraduate and graduate had been in the sciences. So I became a high school science teacher and that was my first job in education.

And then over the years I had a wonderful opportunity to do many different things in education, including helping to create an alternative school program for kids who are at risk of dropping out. And also always kind of working on different professional development. So I've now been working for the Montgomery County ESC.

For 12 years and have the last of those five years, I've been the director of the Dayton regional STEM center. It was a really great fit with my science background and a lot of the training that I've been doing around problem-based learning and it kind of all culminated into working with the STEM center.

Kara: Okay. So did anybody push you to pursue education or did you just kind of have this realization?

Liz: You know, if it was a member of my family, they were very sly about it because I never, ever once felt pressure to go into education, but when I did, I did know. I just knew it. And I knew that it felt familiar and that it was a way to help people. And I think it was not maybe even so much my family members that were the pressure, it was watching how people interacted with them. You know, growing up as a kid with both of your parents, being teachers in the area where you grew up, you can't go to the grocery store without being stopped by someone.

Oh, you were my favorite teacher coming up and giving them. Older people who had been their students years before coming up to them and just telling them the impact that they'd had on their lives. And now this was, again, my parents, my grandparents, my aunts and uncles. And so it may have been those other people kind of showing me the impact that my family had had on people's lives that were more of a push in that direction.

But no, my family, they never really pushed me towards education. But they were definitely happy when I ended up choosing that too.

Caryn: That probably resonates with here a little bit, the whole family and education thing.

Kara: Yeah, for sure. I was going to say my sister did kind of what you did, where she tried everything to avoid. And so she changed majors, you know, five times trying to find something else and ultimately became an educator. And then I semi learned from her. But yeah, I was going to say I only changed once as opposed to five before inevitably.

Liz: Well for me, I never changed the major. I just graduated with it. Then I got a Master's degree in it and then I just kept going, oh, now I have to do the education part. The piece.

Kara: So with your science background and all the work that you've done in STEM, how are you seeing that the initiative, cause do you do STEM or STEAM or both?

Liz: At the Dayton regional STEM center, we do STEM but the way that we rectify that, because I know that many different organizations attached to STEAM or STREAM or STEM with two M's is that we have a STEM quality framework, which was created by Dr. Jim Raleigh and set a standard of quality for STEM education. And it has always been inclusive of content areas that are outside of science, technology and math. So for us, the additional M or the, or the, any other letter that you want to put there has actually always been there. So for us, STEM actually incorporates other content areas, it is not exclusive to only S T E and M. The others are always going to be there. 15 years ago when they created the STEM center, we have that name and we've made a conscious decision to not change it over the years, because we still feel like we are addressing the other areas, even though it's not necessarily a letter in our name.

Kara: Okay. So I know you just speaking for the Regional STEM Center. What ages are you focusing toward?

Liz: So, we support teachers through professional development and teachers of any grade levels. We've had people come through our program who work with students as young, as preschool and up through high school.

When we do outreach for students that the programs that we have right now tend to be focused mostly on elementary. So we have a science Saturdays program and that's usually geared towards elementary, but in the past, there have been other types of programs that have been targeted towards middle school or high school.

So we believe that STEM is for is for all it's for all ages. And really it shouldn't stop at, senior year. It should continue on into college and, and the rest of your life, whether or not you ever become an engineer. But for training programs and for our outreach, we really kind of key in on that preschool through senior year.

Kara: Okay. So for somebody who, when they hear the word STEM. I guess we should spell out the acronym. So science, technology, engineering and mathematics is STEM. So with each of those focuses, what are some of those other skills that kids are really gaining from being involved in STEM projects or STEM curriculum that people might not really think about just when they hear the word?

Liz: Definitely. So I think the first part of my answer is going to be around the fact that we've chosen to put letters that represent different content areas together. So the initial part becomes the integration. So you're utilizing mathematics in a way that's necessary for the science that you're doing.

And you're using technology in a way that's necessary for the engineering. That's going to be occurring. And so, integration tends to bring more purpose, more application to the real world. And so, I think for students who engage in STEM, an initial kind of takeaway from that is they start to see, well, that's why this math is important because scientists do use it.

And it's really important for me to be thinking about how engineers would actually use the science and improve people's lives by understanding the science that I'm learning in my class right now. So I think it kind of provides that purpose in a real world application. When you think about STEM and not just science as its own entity and math as its own entity and technology and engineering. So I think when you put them all together, that's kind of the first part. That's very powerful. The second part is going to really be in reference to, I think, a skillset that is developed through stem and that's going to create everything from the idea of a growth mindset.

So when you truly do STEM, there's a lot of failure. There's a lot of mistakes or ways to improve the work that you're doing. So having students learn this idea that it's okay to fail. And your first idea may not be your best idea, but they can be improved. I think that is something that we see teachers who work with stem in their classrooms.

They really see the development of a growth mindset in their students and underlying all of that. Then as they're doing these high quality STEM projects in classrooms with students, you start to see the students develop all of the skills that we want our students to have in order to be successful in whatever career they choose in the future. The ability to collaborate the ability to problem solve the ability to wrestle with something that's ambiguous and, you know, and figure something out when not all of the pieces are clear in front of you. Over and over again, we hear from employers both in and outside of STEM industries, that those are the skillsets that they need for all individuals who are going to come into their career fields that they need in order to be successful.

And we think that STEM education can really help students develop those skills.

Kara: I would have to agree.

Caryn: Yes. Yes. All of those things.

Liz: I mean, when, you know, everybody says, they want someone who can solve a problem and you have to let kids solve problems and not just a problem that has a very quick specific answer. If they only learn how to answer questions that have correct answers, then they'll never be able to problem solve a complex problem that instead of having one right answer has ten okay answers and then trying to figure out which of those 10 okay answers is the best answer. You don't learn that set of problem solving skills without practicing it. And within our preschool through high school classrooms, that's a really safe space in which kids should be practicing that type of problem solving skills so that they can apply it in the real world.

Kara: Yeah, which is fantastic because I don't think that you think of that. And I don't think you think about those skills and developing them in that way, because so much is about the right answer,

Caryn: Right.

Kara: or you know, and sometimes we lose the process. Even if there is one right answer. The process of how you get to something is more important oftentimes, and that's where the learning occurs than just getting the right answer.

Caryn: Right. I think it has to be organic too. Right? You can't just show up and say, we're going to teach you problem solving skills today. It's not authentic. So I think that's why I think STEM is always such a great, I don't know how to say medium, if you will, for teaching those skills.

Liz: Yeah. And if teachers don't necessarily connect with STEM, science, technology, engineering, and math on the surface, I think that PBL or problem, or project based learning provide this type of opportunity for students to gain those problem solving skills. So it's not exclusive to STEM but it is exclusive, I think, to those types of risks that, that you're going to take with your students to get them to do that type of work.

Kara: Well. And what a great way to personalize learning.

Liz: Absolutely. Absolutely.

Caryn: Are you segwaying?

Kara: Well, no, but I was just thinking what great opportunities for the students to also get excited about something or maybe you've given them an open-ended problem and they're deciding how they make it happen.

Caryn: Right.

Kara: You know, and there's more meaning and purpose behind those type of scenarios and situations that you're giving them so.

Caryn: They're able to take ownership and become invested. And I love that. I love when you were talking about failure and when I was in the classroom that was like the number one thing my kids did not want to do. They did not want to fail. They did not want to be wrong. They would rather not try at all then be wrong. Are you seeing some of that? Do you have like little hurdles you have to get over when you start working with new groups?

Liz: Absolutely. And I think that what you just mentioned Caryn is applicable to students and also to teachers.

Caryn: Teachers. Yeah.

Liz: When someone starts off on their STEM journey, even as a teacher, there is sometimes a real concern about failing and unit or a lesson not going, you know, air quotes, “Right.” “Correct.” So, you know, we have to get over that from a teacher's perspective. And yes, it translates to students, who for however long they've been in an education system, have been given problems that have correct answers. So there has to be a little bit of unteaching there when it comes to the right answer is the only way. So whether it's unteaching of that kind of fixed mindset or teaching of a growth mindset, either one of those is kind of what you need to do. And it really becomes a culture within the classroom.

You know, that the teacher sets the tone where the teacher is a learner. I don't have all of the information. I don't know what the right answer is going to be to this. You know, you could probably design something even better than what I've considered. These are all ways that teachers can kind of model for their students, that they're also on a learning journey.

And then as, as students feel that culture developing in their classroom. Regardless of the age of the students, students are curious they want to problem solve. They maybe just don't feel confident or comfortable initially, but once they've been given that option, we see a lot of students coming out of their shell. And sometimes when I work with STEM teachers, they'll tell me that they're so

impressed by students who other teachers have told them, you know, really don't engage in class or maybe students who've had different identified needs, where you would think that they're not going to be able to be successful at a class like this.

And when you take down some of those barriers, there's really no reason that students can't problem solve and be able to be successful when they feel supported. And they know that it's okay to not know the right answer right away, but it's all about using processes and problem solving to get to what's going to be your best answer.

Kara: Yeah, which is great.

Liz: Absolutely. It's really the kind of education that, you know, I want for my own kids and that you know, we want to be able to provide to all students here in the Dayton area, in Ohio and across the entire country. Yeah.

Kara: So if a teacher was wanting to either begin a program or dabble in a trial run, or maybe expand what they're already doing, what advice might you give them or a resources might you point them to?

Liz: So I think if you're local to the Dayton, Ohio area, you need to come check out the Dayton regional STEM center and the professional development that we offer. Every year we run the STEM fellows program, which is a six month long intensive stem training for teachers where they learn how to enact quality STEM education and also are part of a curriculum writing team where they author a unit of STEM curriculum. If you're a little bit too far away to join us at some of our professional development, then we have all of the units that have been created by our teams over the years available on our website, which is Dayton regional STEM center.org.

Under STEM curriculum. We have all of these wonderful units that were created by teachers and industry professionals to focus in on science, math standards. Other, again, as we mentioned earlier, other standards that might be associated like English, language arts or arts that are all embedded in these units.

One thing to keep in mind, especially if you're new is our units are written to be what we would kind of call like the Cadillac of STEM. So they're multi-day units. Some of them might be about 12 days and that might not be what a brand new teacher is really ready to take on. But I still think that by reading through those units, they'll start to see like, what are those levels of quality that I should

be looking for? Because anyone can do a general internet search for STEM and come across some level of STEM activity that they could implement in their classroom, whether or not it's integrated brings in career connections is inclusive of the non-STEM disciplines. All of the things that we look for in our STEM units, you just don't know if that's going to be true.

So the other resource that's available on our website, Dayton regional STEM center.org is that we also have the STEM education quality framework. So there's a page for teachers. And on that teacher page, you can actually find the published version of our STEM education quality framework. And that might be a guidance for somebody who's new to start thinking about.

Right now I might be at the beginning levels of integrating science, technology and engineering and math, but what would it look like if I just made it to the emerging level? Like how could I get a little bit better at this? And I think that's really important because it doesn't happen overnight that people just automatically, you know, bippity boppity boo I'm a STEM teacher. It's changing your practice of little by little by integrating a little bit more over time and becoming more comfortable with letting go of some of that control and giving it back to students.

So, we see this happening year over year with our teachers and many people come back to our training programs year after year for that reason is that it's a journey. It's not necessarily. A one-stop shop kind of operation. But I think that even if you're not in our region you might try to search out some training programs that could help you because one of the things that we find from our STEM teachers what they really value is finding like-minded individuals who are on the same journey or path as they are. They don't have to always find a person who teaches the exact same thing that they do. But to know that there's another teacher out there, that's also trying to get better or try something new and they've been able to connect through, through some of our training programs, that's always really valuable and helping people grow and move forward. In your region, whatever that looks like, try to connect and find other people who maybe through a training program who are on that same journey of interested in learning about STEM.

Kara: That's fantastic advice because sometimes just having somebody to bounce things off of, just have a chat of like something you're thinking, even though it could be totally different from what you're doing in your classroom, just having that collaboration or com comradery is helpful in just feeling empowered even honestly, like sometimes it just gives you the confidence to try it.

So do you have a tip or trick that could be used for implementing the growth mindset?

Liz: Absolutely. And this comes straight from the mouth of Carol Dweck, who is really the leader in the forefront of growth mindset. She wrote the book Mindset and it's called the power of yet. So when you, your. Or your students are struggling to be in a growth mindset and are starting to feel yourself, become fixed. Just add the word yet at the end of the sentence. So my STEM design doesn't work. And then you just say yet, I hadn't passed algebra one yet. And it really reframes the thought process to go from something that was final or fixed to something that's growth and open.

And whether it's using it with kids to help them see that their journey isn't over. Or I know I do a lot of work as myself sometimes I just have to remind myself that I'm not there yet. I think that one little tiny word yet is just so powerful. So that would be my tip or trick.

Kara: I love that.

I do too.

Caryn: We'll using that.

Kara: Yeah.

Yeah. I love that. We may have to continue this conversation and focus toward personalized learning because not only does STEM fit into that personalized learning lens, but there's a whole initiative for personalized learning that Liz will be undertaking soon. So thank you for joining us.

Liz: Yeah, thank you so much for having me. I'm so excited to be able to talk about STEM and I hope in the future, we do talk about personalized learning. I'm really excited to take on this new task here in the state of Ohio helping teachers support, personalized learning in their classrooms.

Kara: Which is a great initiative.

Caryn: Yes.

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