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**Paul Thies.:** The ever-increasing pace and impact of technological change has been the subject to fascination for investors, educators, entrepreneurs, and pundits of varying stripes, at least as far back as 1965, when Gordon Moore first postulated his now-famous law. As emerging technology continues to build upon itself, the trajectory of change is likely to continue accelerating and tomorrow's workforce needs to get a handle now on the critical technical disciplines necessary to thrive in the future.

Hello, I'm your host, Paul Thies. On this episode of *If/When*, we explored a topic of STEAM education, what it is, why it's important, and how to get more of today's students involved in it, with three STEAM education advocates from Jacobs. Joining me for this episode are Kara Connon, STEAM Lead for Europe, Lainie Harber, Communications Project Manager, and Samuel Stanford, Structural Engineer, Jacobs Electronics Team. Kara, Lainie, and Sam, thank you all so much for joining me today.

I'm excited to talk with you about the topic of STEAM education. I know that Jacobs as a company is putting a lot of emphasis on it, which of course makes sense with all the technology and engineering and all the hard science disciplines that the company excels at. Get us started. Sam, I wanted to start with you, can you tell us a little bit, why is STEAM education so important?

**Samuel Stanford:** STEAM is literally everything. It's science, technology, engineering, arts, and mathematics, and there's a hot debate-- I wouldn't say hot debate. There used to be a hot debate about STEAM versus STEM, and I'm sure we'll get into that. Without STEAM, I don't know where we would be at as a species. I think we would still be dwelling in caves and worrying about predators and stuff that we never thought we would have to today.

If you break it down, science is in medicine and in beer and ice cream and love and technology is, look at what we're doing right now. We're taking advantage of electromagnetic waves that are running thousands of kilometers, and being able to talk in almost real-time, a little bit of a delay, but almost in real-time.

You have engineering, we get into cars and buses and trains and planes to go places. We have art, of course, art is communication to be able to talk, to enjoy, expression through sculptures and paintings and drawings, and then of course math. Math is the ability to model the universe and understand it to a percentage of uncertainty, but to be able to understand it, that's the unwritten language of reality. I would say it's paramount to have STEAM education.

I don't mean to take an egocentric approach here, but I think STEAM education is paramount so we can continue our success as a species for generations to come, and also protecting our home, taking the ego out of this conversation, just protecting our home, which is earth and protecting the species, the flora and fauna that's all around us. That's why I think STEAM is very important.

**Paul:** Excellent. Kara, what drew you to want to help promote STEAM learning and training?

**Kara Connon:** I first became aware of STEAM or STEM as Sam referred to, it was originally back then, through a major roads project that I was working on at the time. I'd had very little of involvement with school pupils, so I moved back to Scotland after five years in London as a stakeholder consultant to become completely immersed in a new role as an education liaison officer, which was a completely eye-opening experience for me, but within the first few weeks, I absolutely knew that that was where I wanted to focus my career, even though it had been so far removed from what I was doing originally.

More events that I ran, the more I could see that spark ignite in the pupils and they began to understand about the jobs that there were in STEAM and all the questions they were coming up with. It started to show me that they were really getting it. Then the more work I did with different age groups, I could see the difference we were making in the younger years, just letting them know the basics of the STEAM jobs that were out there, how they approached certain subject choices when they got to early secondary school, and how we were able to help them become better informed about the jobs available to them, if they took certain subjects. Finally, also supporting them through further education, be it through apprenticeships or a degree.

**Paul:** As you've been walking this journey, what have you found, Kara, are some of the more effective strategies for promoting STEAM education?

**Kara:** For me, what I found, from my experience is coming at it from all angles. There's no one-size-fits all when it comes to promoting STEAM education. We need our fantastic STEAM ambassadors to go out there into schools and communities spreading the word about STEAM careers, different pathways into them, and sharing their enthusiasm about their own roles.

Our STEAM office city or country leads throughout Jacobs to coordinate their networks of STEAM ambassadors, making them aware of the opportunities to engage with pupils and teachers and giving them the support that they need to make these events successful. Not only working with the pupils, but also working with the teachers and the parents as well, so that the same message is getting out there to everybody.

A STEAM activity can reach the number of pupils present in a room, but by working with a teacher, they can then take that knowledge and spread it year on year on year. By working with parents and communities, we can dispel some of the myths on certain careers that Sam mentioned, and support them in helping their children make informed choices for their future subjects and their future career pathways.

Our STEAM ambassadors have different levels of experience when it comes to running events. Even in terms of developing appropriate materials or knowing the right language to use to speak to different age groups. What we've done is provided Jacobs STEAM training course to give our ambassadors the strongest base knowledge that we can to give them the confidence to go out there in front of pupils,

and we're always supportive, of course, of if newer ambassadors want to pair up with more experienced ambassadors, just to get the best for everyone.

At Jacobs, we've got our employee networks and we encourage STEAM to be that golden thread that runs through all of these. We've learned that in order to capture, not just the imagination, but even as basic as the attention of the pupils, we need to be really varied on how we deliver STEAM events to different year groups. This often means having the right ambassadors for the event, ensuring that it's fun and interactive, but it's also an engaging experience for them. We don't ever want to always just do one big event that reaches big numbers of pupils at once, but has no lasting impact.

We, therefore, promote the idea of working regularly and often with the same pupils throughout their time in school. This way we begin to build up relationships with the schools, with the teachers, with the pupils, and they can see that genuine emphasis that Jacobs put on STEAM education are values to encourage a future pipeline of employees who've basically grown up with the name Jacobs as a company and they know what our company can offer.

**Paul:** That's very fascinating, Kara, in terms of the emphasis that Jacobs and other education-minded organizations have. Lainie, I want to flip this a little bit and ask, because the success is going to be where it's treated as a dialogue and not a monologue and sense of kids want to be a part of the discussion they want. In order to reach them, we have to be able to encourage them to speak as well. Why should young people, do you think, Lainie, why should they care about STEAM topics and disciplines?

**Lainie:** There are so many reasons, and it does seem that the younger generation have a true hunger for caring for our home, as Sam so wonderfully put it. For a ton of reasons, but STEM careers really are focused on addressing the biggest, most intense and complex challenges of our time, and these careers will create our future and the world we live in, and how we in turn respond to the new challenges. Obviously, there's challenges with every generation and STEAM careers are going to be instrumental in addressing those and finding the opportunities for success and creating an even brighter future.

Here it's important to call out that, when we say, "STEAM careers", it encompasses so much. Like Sam and Kara have mentioned, there's infinite opportunities for this to be applied. If you're listening and you're thinking, "Oh, well engineering or math, isn't my strong suit." Well, I think we all on this call would encourage you to maybe think a little differently, a little more broadly about what it could mean for you, how to take your skills and your experience, and then apply them to STEAM careers. Because it isn't just one thing. It isn't just engineering. Chances are, if you think about it, you could apply your skills, your passion to do these things. For me, STEAM careers, it really boils down to its creative problem-solving and creative solutions, and we know that there are infinite ways to solve problems. Just tying it back to our organization. Jacobs does a really good job of finding those people and finding the solutions in a creative and fresh way. I think so much of the work that we do, and it sounds like everyone on this call is aligned with like really that commitment to the future and the world that we want to have and build. Our younger generations already have that

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inclination, and then STEAM careers are like that vehicle that are going to get them there.

**Paul:** Now, Sam, Lainie had used terminology that speaks about, in a sense, an aha moment, thinking differently in terms of how you approach STEAM, broadening your understanding of that sort of thing. It is really encouraging people who might-- they might be pigeonholing, their perspective of STEAM, it's really challenging them to open that and give it a different look. I'd like to ask you, Sam, was there an aha moment for you in regard to STEAM education that helped you appreciate its importance?

**Samuel:** Yes. If you don't mind, I'd like to jump back really quick to what Lainie said. Because she said that there's people out there that don't maybe appreciate math versus engineering, but as soon as you put the blinders on through school, I think that suppresses a person's curiosity, and we need to have appreciation across the entire spectrum of education to be able to fully understand our capabilities in life.

As soon as you say like if a 10-year-old says, "Hey, I can't get this math stuff right. Maybe it's not for me." No, maybe it's an outside influence, or it's someone that they're hanging out with, or it's the teacher or something. It's never the individual. It's just based on the education that they're receiving. STEAM is for everybody, anybody can be a scientist. Anybody can be an engineer. Anybody can be the next Pablo Picasso. It's within all of us.

Now, as for my aha moment, I don't know, it came in two stages. The first stage I think was actually in college. I was a bit of a late bloomer. Whenever I was in high school, I didn't care too much about education. I was more of a sporty kind of a person, which looking back on it now, I think I've 180, my entire thought process. Being that I'm now a part like, I have a physics degree, and I'm a structural engineer, but my aha moment was whenever I was actually taking environmental and sustainability courses in my later years in college. It just opened my eyes to a lot that's going on in the world, and it made me care.

sometimes I think the aha moment is more social than it is informative. That progressed me to look more in a broad sense and look at who I am as a person and what I know, and then it came to pandemic time. I know we don't really want to talk about the pandemic, but whenever it was pandemic time, there was a lot of time to self-assess and reflect on where I was, and also reflect on where we are in life. I was like, "Wow, there's not enough science communicators out there." There's a lot of people doing the science across the board. There's hundreds of thousands of people that are working on specific problems. My aha moment was, "Wow, we need science communicators." I'm like, "I need to do something about this."

That's where I started writing ecological blogs. I call them research blogs, because there's a heck of a lot of research in them. Then also my podcast, because we got to get information to people that they can understand socially and informationally and connect the dots across the spectrum.

**Paul:** Kara, Sam, was talking about education and the importance of that role. Are there any educators who you would point to who were particularly influential in

raising the profile of STEAM education efforts for you, perhaps someone in your own experience, and can you tell us who comes to mind and why?

**Kara:** I had a long think about this question. I went back to my school teachers, and I was the geography geek. That was my thing. Mrs. Crisp, she was fantastic. She led me to understand that if I enjoyed geography, if I did that as a university degree, that I would enjoy whatever job I went into. Actually, the example that I'm going to use is someone a lot more recent than that. I had the pleasure of working with a lady called Christine [unintelligible 00:14:53], who was a sub-consultant to Jacobs on that major roads project that I mentioned. Having started in 2015 with no background in running educational programs previously, Christine acted as a mentor and a friend to lead me through this educational side of the framework that we did for that project. Christine, who's now retired, was previously a teacher who among other roles worked at the University of Strathclyde, where she led the innovative roots to learning team from 1999 to 2010.

During that time she developed what was called the Summer Academy. She delivered and developed this program that was in aim to widen access to higher education, but also to close the attainment gap. She actually was awarded an MBE for her services to education for this program. It was an utter honor for me to be able to work alongside and learn from somebody who's got that much passion for raising the role of STEAM. It certainly ripped off on me, and I can only aspire to achieve half of what she has in the course of my career.

**Paul:** Wow. That's amazing. I want to circle back earlier in our discussion, Lainie, this question is for you. Sam and Kara both mentioned it as well. You often hear the term STEM rather than STEAM. What's with the A and why has Jacobs decided to add the A?

**Lainie:** We've gotten that question many times when we're talking about STEAM externally, and it's a valid question. We've adopted STEAM, expanding the traditional and perhaps definitely what more well known STEM reference to incorporate the A, the arts, because we believe that highlights the value that creativity and design and innovation bring to our projects. Maybe those pieces don't fit into like maybe the more traditional categories of science, technology, engineering, and math. They're absolutely a piece that we bring to all of our projects, and by doing so, we think that enables all of our people globally to see themselves and the work they do in STEAM at Jacobs.

We're all about inclusion. At Jacobs, we want people to be themselves. The idea is that no matter where you sit or what you do, you know that your work supports our communities and our clients. It's like the idea when we were explaining this internally, we use this example, it's like a car. Of course you want the engine to be an engineering feat and the build to be streamlined and all of the parts to work perfectly, but design and aesthetics matter too. We want to look to be engaging, the design to be efficient. All of these components add up to an even stronger hole than them individually. That's why we've adopted the A and made it STEAM rather than STEM.

**Paul:** I got you. More people can feel like they're-- they can see themselves as a part of it and more students, quite frankly. I think Sam's earlier point, can see themselves also participating as well. Now, Kara, you touched on the role of parents working in concert with educators. Let's talk a little bit about parents as STEAM steam advocates. What are some effective strategies for reaching and enabling parents so that they can become stronger STEAM advocates?

**Kara:** One drawback that we do see as much with the pupils that we work with and the teachers, and we can widen their understanding and their knowledge of STEAM careers and different pathways into them. The parents are so influential. If we don't give them that same level of knowledge to help the pupils, make these informed decisions about their future, then a lot of the great work that we do might not come to fruition. This is exactly why it's so important for us to educate the parents as well as the pupils. For example, apprenticeships 10, 15 years ago were considered the root into career if a pupil didn't get into university, but that mindset has completely changed in recent years, pupils are learning the benefits of apprenticeship, such as earn while they learn, becoming immersed in a company from the start, hands-on experience over the academic group.

If the parents don't know about this shift in thinking, it could then lead to uninformed decisions, outdated conversations on the right career pathway for their child. It's therefore imperative that as part of our Jacobs STEAM strategy that we incorporate an element of working with parents and communities, for sure. We have in the making Jacobs virtual career's fair, which then used will hopefully be done both in school and at home. Pupils and parents can navigate the site to learn about all the different careers in a company such as Jacobs together, so they can make these decisions, and it'll be broken down into school subjects, so the pupils can start right from the absolute basics of what they know they enjoy and then by going into the school subject hubs, that you're going to see around the virtual room, they can learn about all the different jobs in Jacobs or similar engineering companies that have these subjects at the heart of them. For example, if they go into the geography one, they learn about all the things we do in water and environment, from math and physics into the engineering one. What it also allows us to do is host regular Q&A sessions, where the pupils and their parents can both book slots to speak to our employees in various disciplines, so that they again can have these conversations open that honestly with those who can help them. We also have the STEAM tab on the jacobs.com page that parents can learn about all the great STEAM work that we do at Jacobs around the world, and they can start to see the benefit in providing varied work experience opportunities for their pupils and why it's so important to give them the broadest range possible of experiences so that they can make informed decisions about their futures.

**Speaker 2:** Now, Lainie, couple of questions for you here really concerning Jacobs. Diving in a little deeper, I touched on it at the beginning obviously, as a engineering and science and technology company we have a vested interest in cultivating the next generation of workers, but beyond that, diving deeper, Lainie, why does STEAM matter to Jacobs and our clients and communities?

**Lainie:** You touched on a future talent pipeline absolutely is a piece of it, but we also really believe in showing up for our communities, where we live and where we work.

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We know that STEAM and STEAM education and STEAM volunteering, connects us and the work we do with these communities. We also know we can influence future generations to consider meaningful careers, whether it be at Jacobs or elsewhere, but again going back to the top of the call, they're going to address the challenges of today and we're all about solving the challenges so we can have a more connected and sustainable world for the long-term wellbeing of society of our species to borrow that from Sam.

It also provides us STEAM and STEAM education provides us an amazing opportunity to partner with our clients in a different way that maybe is a little outside of our projects. Another way for us to create that social value that is incredibly important to us as an organization, again, to show up to prove that we do what we say, and we say what we do. I think that's a really important piece of why we've doubled down on our commitment to STEAM and STEAM education.

**Paul:** Jacobs, I think it's fair to say that Jacobs sees it as something that's right to do. It's baking it into its culture, but also from a strategic standpoint and as a follow-up, Lainie, how does STEAM support the company's strategy, especially other organizations may be listening and they have some nascent STEAM initiatives, but why should they really go all in? How does it support the strategy as well as just being something that would be right to do?

**Lainie:** That's a great question. I think putting just my employee hat on for a second, it's really frustrating when you feel like things are done in isolation. We didn't want STEAM to feel like, "Oh, here's another thing they're doing." STEAM is part of the bigger hole of our corporate strategy. We've just launched a corporate strategy a couple of months ago, and in the strategy, there are three accelerators that are going to generate this springboard for our business. One of those is climate response, and that is all focused on end-to-end solutions that we create with our clients for energy transition, decarbonization, adaptation, resilience, and natural resource stewardship.

STEAM education, again, going back to this idea of solving these complex problems, is baked right into that accelerator. I think it touches all of our accelerators, but absolutely in that climate response accelerator. The more that we can engage our communities and partners around these events and ideas and training, the chances are it will resonate, build stronger partnerships, and ultimately lead to better solutions. In addition to being a part of the accelerator, it's a part of our sustainable business strategy, which is called PlanBeyond 2.0. Please and encourage everyone to go check it out and outlines.

Everything that we're doing as a company to be more sustainable and specifically outlines our commitments and achievements. As a part of that, as a company, again, part of the strategy, the sustainability strategy, and part of our company strategy, we have a goal of 50,000 STEAM volunteering hours for our employees to achieve by 2025. It's a lofty goal, but we're putting that front and center that we want our people to show up and help build this education and build these partnerships our communities around the world, truly, truly global, because we know that that engagement is a super important piece of this commitment to our brand promise, challenging today to reinvent tomorrow.

**Paul:** Engaging people, activating them, getting them excited about this. Sam, you mentioned earlier that you have a podcast that you started, and it's really exciting. I think it's *Everything STEAM*. Is that right?

**Samuel:** Yes.

**Paul:** I would encourage people to go check it out. It's really a lot of great topics and you and your team do a really nice job there. You're the host and creator. Why did you start it? Can you share a little bit of your experience, what you've learned and what's next?

**Samuel:** Oh, boy. I have many reasons for why I started it. First of all, it was just to broaden my horizons as an individual and sharing that journey with others, because one thing that I overlooked when I was starting was I was just trying to push good information to people. Just making it personal was a lot more important. Like the aha moment, totally resonates if I'm doing the aha wow, I'm learning this, then more than likely the person that's listening to it is also going to resonate with me and go, "Oh my gosh, it's the wow moment." That's one.

Then also my public speaking skills. I would like to keep podcasting, but I'm really looking forward to someday doing public talks, because I think it's a way to reach even more people. A while ago I wasn't very good at public speaking. I was really nervous, even doing something like this. I'm getting a lot better. That's another reason why I did it. Also networking. I get to meet such amazing people throughout the process of this. I've met people in Germany, in the UK, in Columbia, all over the world so far. It's been a lot of fun, and getting to share their work and their passions is great too because the people that want to be on this are just so passionate about what they do. I just interviewed a guy last night and he's a birder. He goes birding, and he's a park ranger and he just loves sharing that. We talked about birds in the environment and their extreme importances and what anthropogenic or climate change is doing to them. That was really fun.

I get to talk to people like that all the time, which is so great. It makes me a better person as well. I can hold conversations with so many different people, which is awesome. Most importantly is just sharing that great information with others because in my opinion, knowledge and love are like the two best things in reality. I'd like to at least give somebody one of those two. That's it. If you don't mind, I want to jump back to what Lainie was saying a little bit earlier, and that communication arts and communication is super important because to be able to get from hypothesis to theory, we need art because there's three ways in which you can get to a theory.

There is the observation, there's the mathematical ability to model it, and then there's the experimentation. One of those things is art, being able to conceptualize it and put it into a drawing or be able to communicate it to others is very vital. Across the entire spectrum, even if we were just talking at STEM, art is so important. If we didn't have it, we wouldn't be where we are today. I just wanted to bring that to an attention.

Then one more thing is that with what Jacobs is doing is super important because we develop unconscious biases based upon many influences through our teachers, our parents, our peers, and other party influences. Jacobs is doing a great job, and

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I'm not trying to promote, but I think it's really important. It just came to my mind is that we're trying to hit the parents, which is important. We're trying to reach the peers, which is doing these STEAM adventures, going to schools, talking to their peers so then it's shared information. Also, we're doing the third-party act. We're not the educational system, but we're showing that these things are super important. As many influences as you can get, shapes these malleable minds. Kids are so malleable. Why not get to them as early as possible? They're doing a good job.

**Paul:** No, absolutely. I think your enthusiasm for the topic comes through and I think that's important as well. It's not just a matter of pounding the kids with information, but making them excited about wanting to learn. I'm not a teacher, but all the best teachers I ever had made me excited to learn. The next couple of questions, first one I want to ask Sam and Kara. I'll start with you, Sam, and then Kara we'll have you come in. Is there anything especially surprising you've learned as you've been immersed in efforts to promote STEAM education?

**Samuel:** Yes. That is such a long laundry list.

**Paul:** Now pick one.

[laughter]

**Samuel:** Delivery of information. I think I explained this a little bit earlier, but maybe go in-depth a little bit more is, delivery of information to lay people. Social versus numbers is key. I try to keep it in the podcast like 80, 20 layman's to technical. That way we can reach a broad spectrum of individuals, but also spike their curiosity. If you get way too technical and way too numbery, like, I can talk to you about the parts per million of CO2 in the atmosphere that we need to reach to get this goal of this certain temperature globally. A lot of people don't care about that.

What they really care about is, how is that going to affect their children? How's it going to affect their wallets? How's it going to affect their social abilities in the next so and so decades? That's way more important because the numbers are cool. They make sense, but a lot of the times it makes sense to only a select few. If you want to hit a broad amount of people, you need to be more social, more relatable. I think the way to do that also is through storytelling, rather than just point blank question and answer, let's move on. Telling a story is super important. The difference in numbers in terms of my analytics if I story-tell person, it's just spitting facts is unbelievably skewed.

One more thing is, it's funny. I've noticed this quite recently is like the bigger your platform gets, the more people don't really want to help you, they would much rather correct you. I think that's something that we need to put a focus on moving forward, is being more tightly knit as a society, rather than tearing somebody down. Let's continue to help them and continue their growth and knowledge. Those are a couple quick things that I've learned so far.

**Paul:** No, and that's wonderful because I think absolutely storytelling is so key. Because we are all audiences, we all love stories and it's like that goes back to why the A? Why it's STEAM and not STEM, is because storytelling makes it relevant and

brings it full circle. Kara, same question for you. Is there anything especially surprising you've learned as you've been immersed in efforts to promote STEAM education?

**Kara:** Yes, I do first want you to say, I completely agree with Sam and I think a huge part of the base training that we do give our STEAM ambassadors is to help them understand that the way they speak to their colleagues, who maybe all have the same engineering, jargon or ways of speaking is very, very different. Not even just for understanding, but of keeping the interest of pupils. There might be the detail of it, but everything has to be interactive because if you think how long you can pay attention to a subject that you perhaps don't know anything about, take that down to a seven-year-old, you've lost them in minutes if you can't keep them engaged.

For me, I can't decide a surprise is too strong a word or not strong enough, but I am completely blown away by the commitment and sheer enthusiasm of our STEAM ambassadors. They all see the benefit to the pupils, but they also see the benefit to themselves of what they get out of it. They get out there, they get stuck into a huge variety of events from early primary schools through to secondary school, right through to college and university students.

The offers of help and support not just for me in my role, but to each other when sharing event ideas and collaborating to ensure that pupils get the best experience possible and a continuous stream of new STEAM ambassadors is all based on the spreading of the word on how important STEAM education is, but also the buzz that the ambassadors get themselves by knowing and seeing the difference that they've made to a pupil's life.

**Paul:** Oh, that's wonderful. Then my last question, this is for Kara and Lainie. This is really for those other organizations, people out there in the professional sphere who may have a STEAM education platform of some size, some are more capable than others. Maybe they're just starting out. Just in the interest of sharing thought leadership and ideas, and, Kara, I'll start with you. What advice would you give to other employers starting out on their STEAM journey?

**Kara:** I've got quite a few. I'd firstly say, aim not just to sponsor events and actually go out there and get your hands dirty. Companies have so much to give pupils and so much valuable knowledge to share that they could potentially shape the rest of that pupil's life. It's also only by getting out there and talking to pupils and helping them understand the vast number of options for their further education and employment out there that they can start to make those informed decisions about their future.

Have a diverse team of STEAM ambassadors from all areas of the business, all grades with different pathways to give the pupils as broad an idea of the different career options there is to them and showing them that there's not always one written to career and it takes people of all backgrounds and all abilities to create strong, effective teams not just in industry, but in any scenario that they go onto their future life. Don't be scared of virtual delivery. There are pros and cons to virtual and face-to-face, but by choosing to incorporate virtual engagement to your STEAM strategy, the number of you pupils that you can reach is far, far wider.

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You can start to sport those STEAM cold spots, which it was previously harder to get to just because we've got so dependent on doing everything face-to-face. Continue building up your STEAM networks and get senior management and middle management buy-in, and this then shows that STEAM isn't just an add-on to your day job. It is something that you live and breathe as part of your role, and it's the benefit for your employees and not just the pupils, and it supports the employees and contributes to their future employee pipeline for the business as well.

I would say, don't be afraid to consider partnering with other organizations, it's not of them and us situation. We could support other people with what we can do, but we necessarily have the same skills as them. Use other organizations to compliment or supplement your own STEAM engagement. Finally, whilst I recommend working with schools on what you deliver to support what they need, I would also consider things like sustainability, net zero, climate change, as well as positive mindset messages to run through all of your activities as these are going to be the challenges that the pupils are going to face again, again in their futures.

**Paul:** Excellent advice. I really like that about encouraging organizations to collaborate not to see it as a competitive competitive endeavor. Lainie, same question for you. What advice would you give to other employers starting out on their STEAM journey?

**Lainie:** Building on care is like rich, wonderful answer so much in there, like actually that you can action on such a great answer, but just building on that. Kara and I have worked together on this for Jacobs, our answers I think are very complimentary, which is very nice. I think initial steps would be, find out what you're already doing. Even if there's not an organized program, chances are, there are people in your organization that already feel passionately about it are doing the work. They're probably superstars. They've built these relationships already.

Chances are, there's maybe something going on in an unofficial capacity. Learn from those people, and then listen to them, find out what works, what maybe doesn't work, what we can amplify, what maybe we want to stay away from. Then from that information and that data collection, build a framework, give people resources and a little bit of structure, but then leave plenty of room for creativity. The goal is never to squash creativity. Again, that goes back to like when you're in school and you're learning and you're like, "Well, I can't do math." Chances are, I guess you can, but we squashed it out of you in some way. We don't want to do that when we're in the professional world either.

Leave room for creativity. Leave room for people to freestyle and have fun with it. When you have fun with it, other people have fun and they engage more and it works. It just works better. I think we can all agree that that is true. Once you built this framework and you provided this resources a little bit of structure, make sure your leaders are on board, get your leaders pumped about to enter support STEAM locally. I would like to share a brief example. When we were presenting our STEAM program to our executive leadership team, we were nervous and we wanted to be perfect, and after our presentation was over, the first question was, how can we help you? That was incredible to have that. We were prepped with questions, we were ready to defend it to the brink, but the question was, "How can we help you deliver

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this?" That was amazing. Then that just paved the way for the conversations to be smoother, for people to engage easier, and it was just so appreciated. I definitely, I want to share that story because that is, man, whew, to get that is incredible.

Once you've done that, you've done all these steps, give your employees the resources and then give them the time, remove barriers for them actually to live to deliver these activities. It's one thing to say like, "Hey, we want you to go out and volunteer, but we're not going to give you any time to do that." That's a conflicting message. If you're asking your people to do that, show up with the time and show up with the resources so that you are again, practicing what you're preaching. You're meeting what you're saying, and your people will respond to that. Those are just some pieces of feedback from our experience that I think enabled us to launch a successful and engaging STEAM program.

**Paul:** Excellent advice. Well, Kara, Lainie, and Sam, I want to thank you all so much for an enlightening discussion today. I've learned a lot and I hope our listeners, I trust they have too. There's so much, it's very rich field to dive into. I love the fact that particularly with the inclusion of the A, because I can certainly appreciate that as a first while storyteller. I think STEAM is-- obviously, there's a lot there. Would love for kids and their parents, educators, and companies, all that work together for a better tomorrow. Thank you all so very much for your time today.

[music]

**[00:42:28] [END OF AUDIO]**