

The Art of Engineering with Denise McIntosh

Episode 006: Dr. Eleanor Small, Product Development founded in Design for Manufacturability with [Johnson & Johnson](#)

[Dr. Eleanor Small](#) shares how chemists take a small formula and produce it on a large scale and why team input and consumer data are so important. She comes from a family of health professionals, and shares how being around science was a big influence for her. Today, she sees how the pharma industry is collaborating in a way that has never been seen before to fight COVID-19. She talks about the challenges (and benefits) of working from home and what business owners are looking for from young engineers.

Denise McIntosh *I'd like to introduce Eleanor Small, PhD, Product Development, also founded in Design for Manufacturability, with [Johnson & Johnson](#) in the Philadelphia area. Welcome, Ellie.*

Eleanor Small *Good morning. Thank you so much for having me.*

Denise McIntosh *And I'm just going to run through a few things of Ellie. She has a degree from [Johns Hopkins University](#) in chemical engineering and the PhD from [Drexel University](#) in chemical and biological engineering. That's a mouthful, and I have a master's degree that I got while I was working. I cannot imagine taking the next step for a PhD. So I'm awed.*

Eleanor Small *Well, I went straight through, I didn't do it in parallel to working. So my mom earned her master's in parallel to working, so I understand how much effort it takes for the people who are brave enough to go back while still holding a job. So I went straight through. Ten years of college is rough, but I personally don't know if I could have done it any other way.*

Denise McIntosh *Wow, wow. One of the things that really caught my eye, Ellie, because at Custom Powder Systems and Integrated Containment Systems, we do the custom design of equipment for making the types of products that you develop. So I just thought it was fascinating to be able to talk to someone who's actually on the side of the product development and doing the end-to-end, scale-up formulation development. So can you talk just a little bit about what that entails?*

Eleanor Small *Sure. You know, within every company it's a little bit different than the definition, but the idea is that you work from the idea all the way through the actual*

development of the product itself through some testing to support the efficacy, the safety, the likeability. I work on the consumer business side of Johnson & Johnson making products you see every day and can buy from, you know, your local CVS or your grocery store. So one of the challenges we face is there are eighty other choices on that shelf and, "Why should you pick mine?" So an important part of what we work on is also what we call consumer preference. And then once you can make anything in a beaker at the lab, which is great, there's a concept that I made one kilogram, and when we're working to make these, they are gonna be making it ten-thousand kilogram.

And, let me tell you, when it comes to chemistry, sometimes the difference between what you can do at one kilogram and what you can do at ten-thousand kilograms is real different. And so that's part of the challenge, is, we have experts in our plants who know the equipment, and the product development scientist is the one who knows the formula, and we have to find a way to talk together so we can find that right process to make the product in really large quantities.

And sometimes you have to use a different technique than what you could at a bench-top scale. Sometimes there are safety concerns. You have to keep an account, you can do things at the lab bench with very small quantities of an ingredient where you're not worried about that raw ingredient, right? And then at the full-scale, when you're doing large quantities, I'm sure as you know, with the equipment you do, we have to build in safety precautions, is it because the chemicals are scary or unsafe?

No, no, they're not. And especially not when it comes to you, as a consumer, in the finished product. When we are in the plant, and we're dealing with a fifty-kilogram bag of a raw material, think about how heavy that is. And our team at the plant has to be able to safely lift that, and safely put that into this ten-thousand-kilogram tank. A ten-thousand-kilogram tank is bigger than most of our own swimming pools. You know, we need to think about how we can take something on such a big, massive scale and do it in a way that's safe for our employees, as well as, you know, at the lab scale.

So that becomes a conversation in techniques, in understanding what we call what's downstream of use, and knowing what limitations and safety procedures are in place of the people downstream from you. And it also comes from them understanding sort of your perspective and where you're coming from. Maybe, "Why did I make a weird choice that they wouldn't have made?" And that's where they have to say, "Well, what's special about that formula that you did something different than you normally would have done?" And that's where that communication with partners becomes so important.

Denise McIntosh *So, I'm glad you mentioned that, because when we started making isolators ten, twelve years ago, I just thought it was fascinating. The gentlemen that we hired to help design our isolators had been in the business for twenty-five, thirty years, and they were developing glove boxes for the Department of Energy. And then what I learned was, all of those things that are so important, which are the ergonomics. And we would build literally a glove box that you could, that people would come, they would bring their tools, and what they were going to do in that glove box so that we could test where the gloves were, how deep it was, how wide it was, and whether or not the height was even right, because operators are not the same size.*

Eleanor Small *And that's what we would, that's you, we're doing your consumer acceptance test because your operators were your consumers who are using your glove box. And we do similar things with our products as well. When we, you know, make a few prototypes, you want to know which ones people like the best, right? Otherwise it's like, "Well, I can make what I like." But, you know, I don't, I'm not sure everyone on the planet likes the same, you know, flavors and likes the same fragrances that I like.*

One example, I'm not a big fan of vanilla. I love vanilla in something that's baking, but I really have trouble with vanilla fragrance. And so, for me, I wouldn't have vanilla fragrance anywhere in the world, but as we can tell by the popularity, vanilla actually is really well-liked in the world, right? So we gotta talk to our consumers, we gotta talk to our end users, and we have to make sure that we're making what they want, not just what we want.

Denise McIntosh *Good point. Well, I'm curious, Ellie, about how you got started down this path, childhood things that were of interest to you, or siblings, or parents, or where did this begin?*

Eleanor Small *It really did start with parents. I'm very blessed, my mom and dad are both, actually, healthcare professionals. My father is a retired Air Force colonel who has an MD. So he specialized in flight medicine, so astronauts and fighter jocks. And, so, very unique, specialized medicine. And he also has a Master's in Public Health. And my mother is a nurse midwife. And she actually just finished her master's a few years ago, so she was earning that master's while she was working. I was very proud of her, to go to her graduation. So I have medical professionals for parents. So health and healing have always been just fundamental to my DNA. I don't know a better way to say it. It's just always been part of my life, is health and healing.*

But I had a knack for hard sciences. I was really good with math. I was really good at physics. So, you know, my parents were very encouraging to kind of poke and prod the different areas that you were really good at. And honestly, for the longest time, I was going to be an archeologist. I'm going to be honest, I was probably going to be an archeologist up until eighth grade. That was where I was going. So I really liked history, I loved the science, the discovery. You can tell I like research. So that's actually how I got to the PhD, I wanted to be an archeologist. But it was in eighth grade where we were learning about DNA, and they were teaching us about the discovery of DNA, and I learned about Watson and Crick, who are the people that are credited with discovering DNA. But then I learned about the woman who really discovered DNA, and her name was Rosalind Franklin.

And Rosalind Franklin was the chemist and x-ray crystallographer who, actually, is the one who discovered the double-helix. But, as we know, back in the early days, women weren't always given the credit they deserved. And so I discovered this woman, and became blown away by her, and not only her intelligence, but also her humility, and her graciousness when one of the largest, most important discoveries was, sort of, other two men took credit for it. And I think, since then, history has done a lot to correct that, which is good. But that, I think, became my obsession with engineering and women in STEM. And that, I mean, eighth grade, that was when it happened. And I was like, "Women in STEM is a big deal, and I want to be, you know, I want to be a part of that." And I just was so excited.

So I was going to do genetic engineering because I figured, you know, if we could just figure out how to use our own DNA to fix ourselves, right? So, and there's a lot of people doing work on gene therapy these days. I'm actually not doing that now, but it was amazing. And that started on my path towards engineering. And I chose Johns Hopkins, actually, for biophysics originally, because a lot of biophysicists really study a lot of the DNA work. But that's where I met a chemical engineer who specialized in drug delivery. And, one of the professors, his work was not necessarily about discovering the molecules themselves, or the treatment themselves, or identifying the treatment pathway, but what he did was figure out how to get those treatments to the person.

Denise McIntosh *Okay. So was that where you did ultrasound-triggered drug release?*

Eleanor Small *That was part of my PhD. So this was in undergrad where I started becoming very interesting. Hopkins had a sort of sub-tracks for their chemical engineering, and one of the sub-tracks is actually focused on pharmaceutical and drug delivery, and then they had a nanotechnology, and then they had a chemical engineering track. I like traditional. And, so, I took that drug delivery track, and that is*

what led me along the pathway to decide I wanted a PhD. And I specifically chose the professor Dr. Steven Ren at Drexel University because he was doing research on how we could use ultrasound as potentially a delivery mechanism for delivery and pharmaceuticals. And that was how that pathway started.

Denise McIntosh *Wow. Things that are happening are, just, are exciting to me. Well, and that, and then here we are in the midst of the COVID.*

Eleanor Small *Oh, yes. And we are learning a lot. You know, I, there are always silver linings, right? Some days they're harder to see than others. But one of the things that I will tell you is, I don't think we have ever seen such collaboration across the pharmaceutical industry. You know, all of us in the pharmaceutical industry, all of us, we got into this industry because somewhere, at some point in our history, that passion for healthcare and healing, that is what led us to this job. No matter which pharma company you work for, that is that fundamental driving core that leads us, right? And now we have a worldwide crisis. And I think, you know, it's a chance. We're coming together. We are collaborating in ways we've never seen before. And what I think it is doing is it's sort of reminding people why all of us got into this.*

You know, people look at us as a company, but they forget that that company is made up of individuals. And, all of us individuals, we're part of these companies because healing and healthcare drive us, and we are all passionate about it. And I have to tell you, I'm just proud of my industry as a whole. I am proud of the empathy. I am proud of the passion. And I am proud of the industry as a whole saying, "We have to break down these competitive barriers, and we have to be one industry team so that we can solve a world crisis." And, I don't know, I've never been more proud to be part of the pharma industry than I am today.

Denise McIntosh *Well, I'm glad you mentioned that, because I have watched some of the people who are part of those collaborations. And it's just fascinating to me that, yes, we're breaking down the competitive barriers, and we're, well, so thank you for being a part of that industry and helping. So, I'm curious, how has this altered your work life?*

Eleanor Small *It's very interesting. So I did work that was a balance between strategic work and work in a lab bench. And, of course, with COVID, I'm very blessed to work for a company that employees are very important. If you look at the Johnson & Johnson credo, which was written back in the forties and still holds true today, our number-one priority are the people who use our products, whether it's the patients, the customers, or the doctors and nurses, you guys are the number one priority. But our number-two priority, that paragraph, that second paragraph of our credo, is our employees. And it's a*

company that really cares about our employees. So they shut us down fast. They sent us to work from home fast. They put a lot of policies in place to enable us to work from home.

And, so, for me, I suddenly no longer had access to my lab bench. And, so, there were a lot of us that are at my, you know, a scientist level. And we were like, "Okay, how do we pivot and still do research? How do we pivot and still contribute?" And, so, I think for a lot of this, it opened opportunities we had never thought about before. I know for me, it offered an opportunity to support another team where they were working on a project that needed more of a technical project-management role. So, and I'm pretty good at organizing stuff, so that got me an opportunity to really stretch outside my current role and try something new. And, but still support my company, still support my business, still support my team. And, so, yeah, it's changed a lot.

My husband and I used to share an office, because we used to only work from home occasionally. But since I'm on conference calls most of the day, and he was like, "Even my noise canceling headphones can only go so far." So we had to rearrange our house and the guest bedroom got turned into my office, and he stayed in the original office, but it's been fun working from home. I think my dog is the happiest he's been ever, because mom and dad are home all the time. You know, I don't mind not having a commute. I used to commute about seventy-five minutes to my location every day to and from. That was seventy-five minutes one way. My commute now is, "How fast does it take me to get coffee and walk down the stairs?"

Denise McIntosh *Yes. So we've done a lot of similar things here in Springfield, Missouri. We are fortunate that we have a building that will accommodate our production workers who can be very nicely-spaced. So that's been good. And then we've been able to, most of us work remotely, and we're a mess when we come in. And the interesting thing for me, and we were talking with the sales group, is the time that has allowed us to really think that's different from being in the office with people all day. So that's been a benefit for us, I believe.*

Eleanor Small *Yeah, you know, I think there are pluses and minuses, right? You have those quiet moments and, they're actually, you get them to yourself instead of having somebody drop by your desk, right? But, as an extrovert who loves people, I will tell you, I miss those moments. My colleagues would drop by my desk and say, "Hey, Ellie!" And I'd be like, "What's up? Talk to me, take a seat." I miss those moments.*

But I will tell you, I, my productivity, I think is equal. I'm not concerned about my productivity. Probably my biggest challenge is walking away at the end of the day. And,

“Just one more email, just one more email. It's just one more thing. I just have to finish the file.” And it's like seven o'clock at night and it's like, “No, you don't. No, you don't. I promise it will be there tomorrow.”

Denise McIntosh *It will still be there tomorrow.*

Eleanor Small *Right. So I think that's been the one hard part. I know, you know, my colleagues have children, I just, I'm in awe. They were already a colleague and a parent, and they suddenly had to be a colleague, and a parent, and a teacher. And that was a career field that they were not trained for. And I'm just blown away by their amazing flexibility, by their patience. I'm just so blown away with them. And I think, you know, we have a lot that we need to do to support them. But I think the one thing I think some people forget is that, “Oh, I don't have kids at home. You don't have to worry about me.” But what I will tell you is, yes, you do. You need to check in on your colleagues that don't have kids, especially the ones that are alone.*

Even though I'm not alone, I'm working from 8:00am until 7:00pm, I catch myself. Eleven-hour days. And so, you know, as a manager, I would say, you need to watch out for both of them. And the needs of your employees that have kids are going to be different, but you do need to check on your employees that don't have kids, because we don't have the family that will kind of force us to walk away. And there's a plus and minus, like, I can see the distraction, the frustration, like, “I'm trying to get my job done. My kid is screaming for attention.” And that's hard. And on the flip side, though, at the end of the day, like, “I have to go make dinner for my kid. I'm not taking your meeting. I'm not answering your email.” Like, you have this fundamental human being who is your reason to walk away.

And I'm a little jealous. I don't have that. I don't have that fundamental human being who is sitting downstairs going, “Mom, I'm starving” that helps me walk away. So, you know, it's just one of those, I would encourage you, anyone who's a manager, just check in with your folks that don't have kids. Check in with your folks who are living alone, and make sure that they're not swinging the other way with their lack of work-life balance. The needs are going to be different, but, you know, we have to support each employee as their needs, right? Individuals, where a team is made up of persons.

Denise McIntosh *Yes. They are real people, and some of them have more compartments than others.*

Eleanor Small *Yes.*

Denise McIntosh So I know, Ellie, you're also the president of the [International Society of Pharmaceutical Engineers](#) for the Delaware Valley. So tell me about those relationships, and that networking, and what you have gotten from that.

Eleanor Small It is an amazing organization. And I am very privileged to have been asked to lead it this year. When I was first looking for a job after I had finished my PhD, I was working with a different group called the [Engineers Club of Philadelphia](#), which is a very cool organization that has a very, very long history. I can't even remember when they were founded. And their role is to bring all the different organizations together. And so it was through that, they do Delaware Valley Engineers Week. And, as we all know, Engineer's Week coincides with the President's Day in February. And they do a whole week of celebrations, and I used to be part of the planning committee. And that's where I met this gentleman who was being awarded the Delaware Valley Young Engineer of the Year for 2013.

And he was a gentleman who was very active in this society called International Society of Pharmaceutical Engineers. And I'm sitting there going... I mean, they didn't have that chapter in my college, but in college, right, we were sort of, like, there's the professional study for each major. You have a mechanical engineering, and electrical engineering, chemical engineering. Drexel doesn't have a pharmaceutical engineering. So I was like, "What is this organization?" And so I got to learn about it, and I was like, "This is the organization that is great for my career." You know? "This is the one that is focused on where I want to be as a career." And so this gentleman introduced me to his colleagues, and I got to learn about what they were doing on the local level. And, really, what they focus on is providing content, and education, and networking opportunities for people in the pharmaceutical field.

So I started attending events, getting to know people, and they eventually asked if I would join the board to try to help them develop some communities of practice at a local level. We had these international communities of practice, so we didn't have these local communities of practice. And so we worked on an idea. It was a good idea. But in parallel, actually, when we shared the good idea at the international level, they were also working to improve their communities of practice. And we came to a coinciding moment where International had really focused on creating access to the international community of practice. And it was in that moment that we realized, you know, International kind of solved that problem, in parallel, because now we have more access to International. So it didn't matter if you were local or not, because everyone had access to the international.

So we sort of faded that part out because, you know, you got to go for, "What are the needs of your members?" And that need wasn't a need anymore.

Denise McIntosh *But you knew it was a need because other people had recognized it.*

Eleanor Small *Exactly. But that's part of, you know, learning to change with the times. We were working on a program and a product, so were our partners at the international level, and we found the answer, and it didn't need to be two different products, right? We found the answer that was, you know, one product we could also support. And then it was at that point, just through that leadership, that I was nominated into the executive vice president role. And I served under an amazing president and have an incredible board.*

We have people from what we call owner companies. So those are your Merck, your Pfizer, your Hanafi, or Spark, Roche, Johnson & Johnson. These are your, like, pharma companies, right? And then we have the vendor companies, and these are all the companies like yours that supply equipment, or services, or raw materials, or things like that. And so this organization is diverse in that we're made up of both sides of the business. And the board is made up of members of both sides of the business.

And we, you know, talk to our members, and we say, "What do you need? What do you want?" And our owners want education. They want their new young engineers to get up to speed on things like GMP, and, you know, "How to Do This 101" and "How to Do That 101." And they want that down fast, because there's all that knowledge out there. Like, how can we enable their engineers? And they want to know what's new and hot. And our vendors want to be able to share what's new and hot that they're working on with the owners. And you want that network connection across.

And then, on both sides, we want to collaborate together to work with the regulatory agencies, because, you know, we've got the experts, right? We've got the people who know it the best. And we're the ones who maybe find some flaws that might need to have some governance around it, or when the FDA decides, you know, "We need to make a policy in place." They want to go to experts and say, "Hey, what is the right way to write these policies?" And that's where an organization like ISPE comes in and says, "Hey, we are a big, old, giant organization of all the best subject matter experts in the field. How can we help you, FDA?" Or, you know, Envisa, or the groups in Europe, Latin America, it's an international organization. Like, "How can we help you? How can we provide you the expertise and the knowledge that you need to know to put the right policies and safeguards in place?"

And so, you know, just through that, when the election came around, I was nominated for president, and now I have the pleasure, and the burden, of leading this year. And we had grand plans. We had grand plans, and then COVID hit.

Denise McIntosh *Yes, well, interestingly enough, we were at the Aseptic Conference in Maryland the week before.*

Eleanor Small *Oh, yes.*

Denise McIntosh *Yes. And I've always found that event interesting, because the last day and the last panel is a combination of FDA people and then some of the presenters. And that collaboration to me is just fascinating.*

Eleanor Small *It's powerful.*

Denise McIntosh *Yes, because they've listened to the presentations of new products or new process development and yes, and all the aseptic, and the containment, and all of that, about how we're moving from, say, downflow booths to a septic isolation. And...*

Eleanor Small *It's important, right, that we continue these collaborations. Collaboration is the single-most-important part of everything we do. And nobody works in a silo, or they shouldn't be, at least in my opinion. Unless, I don't know, unless you're doing a very specific job that only like one person can do, and then you can be in the silo for that moment of work, and then you should connect with people outside.*

But yeah, it's been very interesting. We had to pivot very fast because we couldn't just say, "Oh, sorry, COVID, we can't help our members." That's not what an organization does, right? You can't do that. So we had to pivot really quick. We've been piloting doing some webinar education, because we'd always focus on in-person to create those networks and connections. And we said, "How do we pivot fast?" So we did some pivoting to do more digital education.

But the other thing we said is, "How do we do something timely?" And we have a great member of our board, who's been a longtime member and an educator, and we said, "Hey, can you do a series of like, you know, 'Immunology 101', 'Vaccines, 101', and then 'Antiviral Therapies 101'? Because everybody wants to know, like, I mean, 'Why the rush for a vaccine instead of a cure?' And then, 'Well, if we just have a cure, is that fine? Or do we really need a vaccine?' And, 'How does the vaccine work anyway?'" And so he put together a three-part series for us that was literally like, immunology, like, this is

how your body works. It was a fantastic anatomy and physiology lesson that I'm not sure a lot of us in pharma ever got. I think it was really important.

And then he did the basics of "This is how vaccines are made. This is how they work." And then a basic of, "This is how antiviral therapies are made and how they work." And I think that really helped everyone in our industry either have more appreciation for our colleagues who are working on these vaccines and antiviral therapies. It also gave us knowledge to discern when the news being shared is a fact versus an opinion. Because if you don't have a base amount of knowledge, sometimes opinions sound like facts. And we all know that that is a common problem today, is, "What is a fact and what is an opinion?" So it was a great opportunity to really support our members and basically give them enough knowledge to really educate themselves.

And so we're continuing to pivot where we're thinking about what to do next year. We're trying to, you know, make some guesses about, "Maybe when could we see each other in person again?" And, you know, all the other parts that go with managing a nonprofit organization. There's a lot of behind-the-scenes management that occurs to ensure that we can be a long-term existence in our members' lives as opposed to there and gone. So, working through some of that complexity as well. It's amazing how powerful a group of twenty people can be when we all sit down at a board meeting and go, "Okay, so that just happened. How do we pivot fast and still bring value to our members?"

Denise McIntosh *Good. So, Ellie, have you had or seen any challenges in your work life as being a woman versus the men in the industry? Or have we moved far enough now that that's disappearing?*

Eleanor Small *Oh, no. Oh, no. There have been good steps. There have been great strides, but this battle is not over. And, you know, I, if you look at, forgive me, I don't remember the statistics off the top of my head, but something like I think it's something really low, like in the single digits, like five-percent of board members of Fortune 500 companies are women, or something, it's like under ten-percent. Forgive me, I don't remember if it's three, five, six, but it is a single-digit of Fortune 500 companies, their board members, not even the head of their board, their board members are women. And, really, gender-piece aside, diversity period is how good companies operate. If you look at the companies that are the most successful, the most innovative, diversity in way of thinking, which means diversity in the background, because how you were raised, what degree you got, that brings that diversity of thinking.*

So in order to get diverse thinking boards, you need diverse people. And that diverse people comes in educations. It comes from cultural experiences. It comes from gender.

It comes from what country they were based in, right? If you want a successful, innovative company, you need diversity. And so there are many battles, beyond even just gender, that still need to be one in the boardrooms to ensure diversity. And you know the companies that are making those changes, because those are the ones that are sitting at the top, because those are the ones that are innovative, and those are the ones that are leading the way. And when you look at their board, you go, "Oh, their board is actually diverse. Wow." Put two-and-two-together, you think more people would do it.

You know, but to answer your question, I'm very blessed in the company that I work for. Most of my managers and directors have been women. I am, I got lucky. So I'm very blessed in that I have a pretty awesome company that I came from that I still work for. And there are a lot of amazing women leaders that I have great examples to follow. But there are still struggles with diversity, and one example I'll give is in perception and just, you know, that happened with me. No matter how much we are still working on accepting people's personalities for who they are, there are certain expectations that are still there.

And I remember getting feedback at a year-end review that I was too aggressive when I disagreed with people. And that was the word used, was aggressive. So I was a great partner to work with, but when I disagreed with people, I was too aggressive in stating my opinion. People didn't feel like their voice was heard, because I was so strong in expressing my opinions. I bowled people over.

So these two words, aggressive and bowled people over. And I remember thinking, "Okay, I can see examples of where debates got, maybe not heated, but intense." And I will passionately believe my point of view until you present me with the correct facts, you know, with the facts for your side. And then if you change my mind, I will passionately defend the point of view that we both are on now. Right? I'm just asking for you to defend where you're coming from, and I'm asking for you to logically tell me, like, "I see where you're coming from. This is how I see it. This is why I think this is a better route." And I'll be like, "Hmm... I'm on board, and we're going to go sell this to everybody." Right?

But it was really interesting when I read those words. And so I thought to myself, "Okay, I can see moments where I was intense." I'm a very emotive person. I am, I wear my heart on my sleeve. I'm a highly empathetic person, and sometimes being more outwardly-emotive can get you in trouble. I'm aware of that. I have what I call a cartoon face. I'm not a good poker player. I don't play poker because I'm terrible. But I have a cartoon face, I'm expressive. And, you know, I'm working on these, right? As

professionals, we always work to develop our outer shell, our professional polish, right? They're our sunglasses, we're not changing who we are. We're changing, you know, the level of how dark those sunglasses are on the outside.

And I remember bringing those home and I was like, "Let me talk to my husband about it, 'cause maybe he's got some ideas." My husband's always my, the first person, I always talk my feedback through with, because he loves me, but he loves me enough to tell me like it is. And then he also loves me enough to tell me when he doesn't agree with what he's reading, and the first words out of his mouth were, "I bet you, if you were a guy, they wouldn't have said that."

Denise McIntosh *Oh, bless his heart.*

Eleanor Small *But you know what shocked me? That was not my first thought. My first thought was, "Oh, I wonder if I have been too aggressive." My first thought was, "Oh, I wonder if I have been..." And, I mean, I do have a loud voice, and maybe I'm interrupting people too often. My first thought as a woman was, "Oh, I need to be softer. Oh, I need to back off a little." And my husband, God bless him, was like, "Yeah, if you were a guy, you wouldn't have gotten the feedback." And I was like, I mean, it was a shock, not only for that piece, but the fact that, like, I didn't recognize that.*

Denise McIntosh *Ellie, that's how we were raised.*

Eleanor Small *I know.*

Denise McIntosh *I mean, we still are. We still are doing that. They, you know, that's probably one of those things we really need to take to heart about that diversity training for both men and women, to be able to acknowledge the kinds of those very things.*

Eleanor Small *Yeah.*

Denise McIntosh *Because I work with primarily men in this company, have my entire career. And, yes, I have hair-raising tales, but, you know, I, here we are, we're still here. I was just amazed that our marketing group said to me, "Denise, you really need to do these podcasts because of these very questions and these conversations, because we need to encourage more young women to follow us into the sciences, into manufacturing, to get to those diverse companies."*

Eleanor Small *Yes, absolutely. I'm a big, big proponent of that. And it can't just be the people at the top. It has to be individuals. Like, I should have recognized that, you know,*

feedback is given anonymously. I'll never know who said it. And, but that aside, like, I should have at least questioned those words. I should have questioned them. Now, there is a line, there is aggression, right? I know when I'm crossing those lines, right? And so it's something that I've just been more aware of, but I also have said, "I'm not going to back down." But maybe what I can do is coach myself to say, "I'm just going to play devil's advocate for a moment." Right? So that way I'm making it clear to everybody. I'm not just being stubborn, I'm just putting it out there. And so there's little things we can do to help everyone understand, you know?

But another example I wanted to share, I do a lot of work with STEM education through an employee group we have at J & J. And we were working with a high school robotics team, and it was really interesting. A young man I work with that I greatly value, he's been a good friend. And he came to me and said, "Hey, I am really struggling with this one team we're working with, because the sponsors of this team, like the mentors of this team, there is an attitude in the team that the women can't be part of the engine, the mechanical building team, they can only be part of the marketing and communication side of the team. And I said, "Well, how do we... We need to find out the origin of that. Like, why do, why does the team think that?" And what he came back to tell me was that, one of the team mentors, who was a woman, was the one who was propagating that point of view.

Denise McIntosh *Oh.*

Eleanor Small *And so we had a great meeting and, you know, this young man has a great future in front of him, that he was like, "How do I, a guy, how do I fight that? How do I do that?" He's like, "I'm a guy and I'm pissed off about it." And I was like, "Well, I mean, I'm glad, first of all, congratulations, step number one." But it was like, "How do we change this?" It wasn't just the team attitude, but it was, a woman in a position of authority was propagating this opinion that the women on the team, the young ladies on the team, could be part of the marketing and communications, but they couldn't be part of the mechanical build team. And, you know, you have these moments of, like, "Ugh, no! Wrong!" But more importantly...*

Denise McIntosh *Of course they can!*

Eleanor Small *Right? But it was a great learning moment for this young man, because he was like, "How do I fight that? Like, I'm a guy. Who's going to listen to me?" I'm like, "Actually, more people than you think."*

Denise McIntosh *Well, Ellie, thank you for being a part of moving this forward. And thank you so much for the conversation this morning. You and I need to meet in person one of these days when we can, but thank you for being a part of the industry and being a woman in the industry. And, oh, by the way, I just really wanted to mention that you were the Young Engineer of the Year in 2019 for the Engineering Club in Philadelphia. So congratulations!*

Eleanor Small *Thank you. It was quite a surprise and an honor, and I'm very blessed. It's a fantastic organization, and I was very honored by that award. So I think it's just so important that we continue with this stuff, right? Pay it forward, pay it forward. There are lots of amazing young women out there.*