



## Jill Zande

**Jill Zande:** [00:00:00] Our ideal situation, when someone gets so excited and gets involved in it, upper elementary school, stays with it, moves on to a school that has the MATE competition; and moves on a middle school, stays engaged; and then, moves on to a high school; moves on to a college or university, and then into the workplace.

**Annalies Corbin:** [00:00:21] Welcome to Learning Unboxed, a conversation about teaching, learning, and the future of work. This is Annalies Corbin, Chief Goddess of the PAST Foundation and your host. We hear frequently that the global education system is broken. In fact, we spend billions of dollars trying to fix something that's actually not broken at all, but rather irrelevant. It's obsolete. A hundred years ago, it functioned fine. So, let's talk about how we re-imagine, rethink, and redesign our educational system.

**Annalies Corbin:** [00:00:56] So I'm very excited today to talk about the MATE ROV program, which, for folks who are not familiar, is one of the most wonderful underwater scientific research, technology, expeditions, solve real-world problems, endeavors that I think that are out there and available to kids, to schools, and communities. And I have been a fan for many years. And joining us today to talk about MATE and all that MATE is and aspires to be is the Associate Director, and Co-PI, and the Competition Coordinator for the MATE Center, Jill Zande, joining us from California. So, thank you, Jill.

**Jill Zande:** [00:01:41] Thank you, Annalies. Thank you for that wonderful introduction. I appreciate your kind words and description of our underwater robotics program.

**Annalies Corbin:** [00:01:49] Well, for those who know me, my background and experience is in underwater archaeology. And so, what I love and appreciate so much about this program is the fact that it helps folks understand that there is an entire world that's under the surface. And there's so much we don't know about it and there's so much work to do in that space. And it's just infinite possibilities in terms of both the research, and the science, and the careers for kids. And for the most part, kids have no clue.

**Jill Zande:** [00:02:23] Right.

**Annalies Corbin:** [00:02:23] So, it's exciting to me that there's a program out there that helps kids kind of onboard with that. So, I want to talk a little bit, Jill, give folks who aren't familiar the sort of 50,000-foot view of what this thing is. What's MATE ROV?

**Jill Zande:** [00:02:40] Thanks, Annalies. So, yeah. MATE's ROV, remotely operated vehicle, it's a type of underwater robot. It's a tethered robot tethered to the surface where it's controlled by individuals with joysticks or switches depending on the complexity of the vehicle. And so, really what the MATE ROV program has

evolved into is a competition, an underwater robotics competition. We are a global competition. I would never have thought 20-some years ago when we started this, and started working towards laying the foundation for an underwater robotics competition, and really getting into using ROVs as tools, as vehicles, if you will, to get students excited about STEM, and give them an understanding of the ocean, and as you mentioned, career opportunities.

**Jill Zande:** [00:03:31] I would have never had thought that it would grow into a program that we have 40 regional ROV programs that take place across the country and around the world. The majority are in the US, as you can imagine, that's where we're based, that's where our roots are. But it's amazing how popular this program has become across the globe. And so, it is an underwater robotics competition, as you described. We set out to challenge students. They get together in teams and we challenge them to design and build an underwater robot, an ROV, to tackle problems that are based on real-world scenarios. And I think-

**Annalies Corbin:** [00:04:12] And that's the thing I love the most, right? And that's one of those distinguishing features between what MATE does for our listeners because I think this is so important, Jill, and for me personally, and I love robotics of all kinds. I think there's so much that can be learned there, and there's so many skills, and it's a great way to engage kids into really high-quality STEM and technology education. But all that aside, what I love about MATE and the reason I tout MATE is that it's based on real challenges. It's just not gamified opportunity to learn robotics, it's real work.

**Jill Zande:** [00:04:53] Annalies, thank you for that. And with all due respect to the other robotics competitions out there, right, it's tied to real world. I mean, yes, there is some value in learning how to build a robot, to throw a ball through a hoop or put a box in a square, but to be able to tie that application of those skills to real-world stuff. Not everybody is going to be a basketball player, right?

**Jill Zande:** [00:05:19] There's a slight chance that you're going to go onto that career than you are to go out in the real world and solve some of these challenges. And so, we've had competition scenarios focused on to give a nod to your background and interest underwater archaeology back in the day when I first met Marty Klein, who I know as one of your guests previously. We focused on challenging students to explore and document the Titanic.

**Annalies Corbin:** [00:05:50] Yeah.

**Jill Zande:** [00:05:50] And we have had students, we focused competition scenarios on helping to lay and install cabled ocean observatories for scientific research. We've also had students challenge them to build our OBIS that transformed decommissioned oil rigs into artificial reefs. So, yes, our scenarios are simulated in the swimming pool for the most part or a tank, and it's not out in the Gulf of Mexico or out in the North Atlantic, and it's PVC pipe and [indiscernible], and my colleague, the competition technical manager, Matt Gardner, he is a self-proclaimed PVC artist. I have wonderful, wonderful simulation of ocean-bound seismometers, and decorator crabs, and whatnot out of PVC pipe, and tighteners, and duct tape, right?

**Annalies Corbin:** [00:06:47] Yeah.

**Jill Zande:** [00:06:47] Because you can't do it without duct tape, but-

**Annalies Corbin:** [00:06:49] It's the best, and not the 3M, right?

**Jill Zande:** [00:06:54] Well, anybody going out at sea knows that duct tape and cable ties or tie wraps, everywhere you use, described the more important. But yeah, they're simulated pieces, but it's really about the

simulation of the real world and the real-world application. So, you're solving a problem. I think one of the things that, potentially, your listeners could really relate to if they're old enough, back in 2010, during the Deepwater Horizon, oil wellhead blowout. I mean, what a tragedy.

**Jill Zande:** [00:07:26] And I know we were all sitting there watching it unfold and I'm watching the camera views of the oil spewing from the wellhead. And so, the following year, we actually focused our competition on that exact scenario and challenged students to do exactly what those engineers, and our pilots, and technicians were doing, and that was to solve the problem, and actually build a cap, place it on top of the wellhead, and stop the flow of oil. Again, all simulated, but it was these game problem-solving skills, the same challenge that the real-world professionals were facing.

**Annalies Corbin:** [00:08:03] And I've loved every single one of them, that I've had the privilege over the years to either be an observer for, a judge for, a participant for, or PAST runs one of those regional challenges. And so, it's been really, really exciting in a whole host of ways and unexpected over the years. But I will say, since you brought up that particular one, but that one was really near and dear. And what was awesome about that one in particular is that, so PAST Foundation had been part of a global team that over many years had been doing monitoring work on deepwater shipwrecks in the Gulf of Mexico, which is neither here nor there.

**Annalies Corbin:** [00:08:47] But when the oil spill happened, because we had been involved over a number of years, that particular team had the best and most recent sort of long-line data from shipwrecks that were in the vicinity of the spill and around the Gulf. And so, this tragedy happened, and the science, and just the the rounding and collection of researchers and technicians from around the globe that deployed units in that moment to solve that problem, and then to be able to tap back into the data that we had over time to be able to monitor the impact. And so, when the challenge came along from MATE to go back and actually participate in understanding what happened in this global environmental crisis, and the technological opportunities that it was going to take, it was a huge lift to actually cap that well.

**Annalies Corbin:** [00:09:39] We saw it going on four days, back to your point. It helped, I think, those kiddos really understand and make it real. And certainly, for us as an organization participating with MATE, we had the opportunity in that moment to share with those kiddos why it was so important, right? Because we had some real, tangible, firsthand experience with the event itself that this was being tied to. So, it was timely and it was a hugely, hugely impactful thing for the participants. In the regional that we ran, we immersed them with that, and you can watch the light bulbs go off, I guess. And so, I thank you for that for crafting a competition that was so incredibly real.

**Jill Zande:** [00:10:23] You know what, a couple of comments to your points, I'm excited that you mentioned that. I did not know that you all had a personal or rather a PAST foundation connection to that particular mission, but you illustrate a great point. For us, while we have all these regionals across the country and around the world, and certainly, at MATE central, if you will, headquarters, we provide the infrastructure, we lay out that year's challenge, but we also encourage each regional to make it their own.

**Jill Zande:** [00:10:57] So, the fact that you were able to tie it into and show the students in your—hey, we as an organization, have a role in the Gulf of Mexico, and are part of this effort and deployment of resources and people to address this challenge. And here's how we're doing it. It's not about capping a well, but for us, it's about bringing our shipwreck experience and all of that data. And similarly, in other competitions we've had a regional in Oregon, and Oregon State University scientists, some of the critters I think that we highlighted in last year's maintaining healthy waterways mission, they brought that.

**Jill Zande:** [00:11:36] It was set in Kingsport, Tennessee because that's where our World Championship was held. But for their regional, they tied it to their own local backyard, if you will, and their own strains, and their own species. So, I like to think that's one of the things, in addition to focusing on real world, that we enable and encourage our regional partners and our regionals to do, is make that connection, that tie-in. And it's interesting, too, I do have a personal past connection as well to the oil spill. And in future competition years, we focused on the deep-sea corals species, and some of the work that was done by scientists who had studied the deep-sea coral prior to the spill, and then we're going back to see the impact of the spill.

**Jill Zande:** [00:12:26] And one of those scientists was my former professor at Penn State, Chuck Fisher. So, I worked with Chuck. I was a senior at Penn State. He just came to Penn State when I was a senior. And I worked in his lab. And I really have to give him credit for setting me on this journey to continue to study deep-sea organisms. And it was very rewarding for me and fun for me to go back to him years later now in my in my current role as the coordinator of the competition and ask him for some of the data and some of the work that he was doing around the spill, so we could highlight it in a competition scenario. So, I love all the connections.

**Annalies Corbin:** [00:13:08] It is wonderful, and it's still going on because we weren't doing the deep coral or the marine wildlife components of it. We had some rules on evaluating the shipwreck component, the structure pieces of it, but more importantly, we were handling the sort of community outreach and engagement pieces of it. But to your point, it's really, really rewarding for those folks that are doing that amazing work, studying the Lophelia, and the other coral, and marine life, and to be able to have that long-line data and be able to track it back to this event. And then, this event then spurring all kinds of technologies that could then turn up later as an educational module, an opportunity for the next generation of folks who are going to solve the next big environmental crisis. So, it's pretty amazing. That's an amazing journey.

**Jill Zande:** [00:13:59] And I think it's also interesting, and again, to pick up on something MATE said about, exposing students to careers. I mean, that was one of the big reasons, the major reasons, and outcomes, and goals for creating this competition. Not that were the experts in every single career that we might highlight or is tied to one of our scenarios, but to just raise awareness that there's opportunities to research deep-sea corals, and there's opportunities to work for companies that are remediating things like that or companies that are looking at how to make the best use of our underwater resources, and just being able to open students' eyes to all the different possibilities.

**Jill Zande:** [00:14:43] And so, that was definitely a goal from the beginning, and I'm glad we've been able to do that. And just to one more point about the Deepwater Horizon spill, as we're sitting there watching the video of the oil coming out, we actually had some former competitors, some competition alumni, if you will, who were out there flying these vehicles and helping to remediate and deal with the spill. So, that was really rewarding. And it was amazing to be able to share with the competition community, the other students, hey, there was someone just like you who is struggling to challenge, and now, look at them, they're out there helping to solve it. So, it was a really great, great connection to be able to make.

**Annalies Corbin:** [00:15:28] So, those particular kiddos, at the time, not only struggled, but they found a place for them. They tapped into a passion, they may or may not have even known they had, and they turn it into a career. And that's a huge, huge win. And that's one of the things that I have seen over the years of watching and participating in MATE as well. And I think that a couple of other things that for me about the MATE competition that are so meaningful, I very much want to make sure that those that are listening understand this.

**Annalies Corbin:** [00:15:59] So, it's not just for older students. There's multiple levels and I'll have you sort of talk us through each of the different levels because there are multiple entry points. So, that's one thing. And

the other thing that I truly value about the way the program has been crafted, and structured, and quite frankly, maintained over the years was really easy, especially in a competition setting, and again, not to take away from any of the other robotics competitions. And my listeners know I love the others as much as I love MATE, but I love them all for different reasons because one size does not fit all.

**Annalies Corbin:** [00:16:35] And at the end of the day, as many kids who we can catch and hook into a variety of STEM careers through these programs, that's the end goal. But MATE is different in another way from many of the others. So, not just that it's very problem-based and it's real world, but it's also financially accessible in ways that many of the other programs are not. The barrier to enter to participate is very low compared to some of the others. So, I'd love to talk about that a little bit, Jill, and how you've managed to make that happen. So, for some of our folks who are listening, who are familiar with some of the other robotics, especially at the high school level, just the entry fees for teams can be \$5,000 and up. But that's not the case with MATE. So, talk a little bit about that if you don't mind.

**Jill Zande:** [00:17:28] Yeah. No, thank you, Annalies for that. I think for us, I mean, it's interesting because I've had these conversations recently with some other newer partners, and we can talk about and get into sort of the future directions of MATE in a bit, but we were established with funding from the National Science Foundation. And this competition was funded and seeded with National Science Foundation, your taxpayer dollars.

**Annalies Corbin:** [00:17:58] Exactly.

**Jill Zande:** [00:17:59] And certainly, we've had support from industry, and thankfully over the years, additional support from industry, and corporations, and foundations. But really, the fact that we're rooted in NSF, and again, your taxpayer dollars, we wanted to make sure that this competition was always accessible to people. And a diversity, a wide range of audience and a diverse audience, right? I mean, diversity, meaning ethnicity, socio-economic status, gender, you name it.

**Jill Zande:** [00:18:31] And so, by keeping our fees low, we felt that we could do that. I mean, it wasn't about filling our pocketbooks or making a ton of money. I mean, it is about trying to sustain the program at this point, but we really wanted to keep the registration fees low so we could keep it accessible. And you're right to the point that you mentioned, are different levels. It isn't just for older kids. We have this progression of work competition classes that go from beginner to beginner-intermediate to intermediate to advanced.

**Jill Zande:** [00:19:04] We've engaged students as young as, I think, third grade, I think, there was some students from a third-grade classroom that participated. And it's this progression. And our hope is to get students engaged and interested at an early age, and then they can build upon their knowledge and skills, and continue with the program. As they advance in their knowledge, and skills, and thinking, they can advance to our different levels and continue to be engaged in the program and build even more complex, different innovative robots to participate.

**Annalies Corbin:** [00:19:39] It is really wonderful to see the little kids in particular, not just at the competition, but we utilize a variety of components of the MATE program in our summer and after-school programs, specifically with our elementary kiddos, and specifically, our elementary kiddos in urban settings, but other places as well. And it's been awesome to see how much they pick up, how quickly, in terms of understanding the mechanics, and the physics, and the optics, and you name it. And not all programs, I think, appeal to those little kids in the same way.

**Jill Zande:** [00:20:19] Yeah.

**Annalies Corbin:** [00:20:19] So, again, I applaud you for that.

**Jill Zande:** [00:20:21] No, thank you. Thank you. And our beginner level, when we started with this, we just had two competition levels. And I will tell you, it was definitely one of those things where build it, and they will come, and they did. And even though we really aimed it, the MATE center itself, the NSF program that established us focuses at community colleges, through your technical colleges. So, we created the competition with a two-year college student in mind knowing that, yes, we're going to engage high school students and certainly, university level because we want to create that pathway.

**Jill Zande:** [00:20:59] And so, we're now creating that pathway from high school into a technical program and potentially transferring on to four-year to get a four-year degree. But suddenly, we saw this huge growth and interest from more high schools, and middle schools, and upper elementary schools. And it was pretty amazing and really rewarding. And that inspired us to go back to the National Science Foundation. We actually got additional funding through the innovative technology experiences for students' and teachers' program.

**Annalies Corbin:** [00:21:31] Yeah.

**Jill Zande:** [00:21:31] And that allowed us to focus on the younger kids and basically adapt and modify our materials, so they were appealing and accessible to those students, and to develop curriculum, and layout. Teacher workshops, and student outreach, and all of our C-MATE ROV kids, all the resources that we have now that we can provide to students to participate, especially, again, the younger ones. And so, that's where we added the scout level that's the beginner level. At this point, that registration is fee \$50, right?

**Annalies Corbin:** [00:22:04] I know. It's very accessible.

**Jill Zande:** [00:22:08] It is. And then, we go up to navigator, that's the beginner-intermediate at \$100, and then ranger is intermediate at \$200, and the explorer class, which is really the advanced, post-secondary community colleges and universities, right now, that's \$400. Now, that's not saying we might need to tweak them a little bit because we need to stay in business. But again, always trying to keep them low, so it's accessible. And also, too, I think, yes, we encourage and students do need to have some skin in the game, and learn how to fund-raise, and have bake sales, whatever they need to do to raise the money.

**Jill Zande:** [00:22:43] That's really valuable. But we don't want to make it so that they have to rely on donations, thousands of dollars of donations from corporations that if you're in rural America, you might not have a law department that can suddenly give \$5,000 to your school. So, again, just really focus on keeping it accessible. And like I said, building that pathway and building that progression, I mean, again, our goal, our hope, our ideal situation, when someone gets so excited and gets involved in it, upper elementary school, stays with it, moves on to a school that has the MATE competition; and moves on to a middle school, stays engaged; moves on to a high school; moves on to a college or university; and then into the workplace.

**Jill Zande:** [00:23:31] And we do have examples of that, thankfully. And we need to do and we will be doing a better job of documenting that and sharing it with everybody because I think that's a real powerful message. And again, really helps to demonstrate the impact of our program. And I think another thing, if I can, that's unique about us, I know other competitions have similar components, but for us, it's not just about the robot. We have what we call our engineering and communication component.

**Jill Zande:** [00:23:59] And that is basically a technical report, an engineering presentation, so gets that oral communication development of those oral communication skills, and a poster or marketing display. So, it's

about the whole package. Yes, your robot, it is important, but that's not all because in those other components, is when they can really demonstrate they're learning, that they learned it. They just didn't plug and play, they learned it.

**Annalies Corbin:** [00:24:25] And the other piece about that, and I have been a judge numerous times on that component in our regional. And what I like about that and the same that I like about some of the other robotics competitions as well, is when they incorporate that, you catch more kids.

**Jill Zande:** [00:24:43] Yeah.

**Annalies Corbin:** [00:24:43] And what I mean by that is that, so not all kids are going to love the robot, but they want to be part of the team or they want to be part of the thing. "I don't know why I want to be part of the thing, but it looks really cool, but I'm not really interested in the engineering or I'm not interested in the electrical." But all of a sudden, by having this component, the technical report, the business plan, those aspects of it, the marketing, you catch the kids that have a completely different set of interests and you show them that that interest and that skillset applies broadly across many, many industries, including ROV, including technology, including deep water sciences and so on. And so, that's one of the things that I really, truly appreciate about the way the program works because it's not, to your point, just about the robot, although the robots are so cool.

**Jill Zande:** [00:25:36] Annalies, I mean, I couldn't put it any better. Thank you.

**Annalies Corbin:** [00:25:39] One of the other things that I also love, and I can say this a lot, on this particular interview is that, again, there are so many different approaches and environments or ways that you can utilize the program. And I want to just give an example that's one that every time I think about it, I chuckle. So, years ago, we were working in very rural South Dakota in a community where there wasn't a science teacher, in this case, hadn't been a science teacher for many years.

**Annalies Corbin:** [00:26:11] And if I remember right, it was a couple of language arts teachers and maybe a Home Ec teacher, I don't remember, it's been enough years now, who were going to have to be the facilitators to deliver some science instruction. And so, we were working with them to try to figure out how they were going to do that. We said, "You know what, here's the thing, how about we do this MATE program with you?" And you can see their eyeballs were about the size of saucers like, "Oh, my God, you want us to do what?"

**Annalies Corbin:** [00:26:39] And we're like, "It's going to be okay. I promise it's going to be okay. We will walk you through it and you are going to be able to have the most amazing team of kiddos who know so much about buoyancy, and physics, and you name it." But the dilemma because they wanted to run the program for themselves, they needed to do it through the winter time. And so, the dilemma was there was no access to the pool or things like that. And so, we actually let them build, and we helped them sort of structure this out, and they used what was on-hand, and then rural America, we had an awful lot of cattle troughs, of watering troughs.

**Annalies Corbin:** [00:27:18] And those watering troughs got cleaned out and hauled up to the school and, bam, off you go, ROVs in the cattle troughs. And the kids would compete virtually with each other because, again, very rural, and talk about their teams, and who is doing what, and what did it look like, and they put on their own mock competition because that was what was going to be available and useful to them in that moment, and off it ran, and it worked. And that's the beauty of the program, is, again, those low-entry barriers to participate no matter how you sort of couch the participation was really, really key.

**Jill Zande:** [00:27:58] Oh, my God. Thank you. That is such a great story. And I appreciate it, I had not heard about that experience with the folks from South Dakota. But I will tell you, where I am in central California, it's bad country, right? And so, yes, we have used cattle, and horse troughs, and various pieces of ag equipment, and filled them up, and used them for testing and flying ROV. So, I appreciate that story. And I think to your point, too, we are able to engage a lot of students and other robotics competition are as well because they had put those other components.

**Jill Zande:** [00:28:33] And I think what also helped to make it appealing and engage a variety of students with different interests, it's a fact that, gosh, it's probably been over 10 years now when we just need a little tiny tweak to the competition. We always knew that it encouraged teamwork, and entrepreneurial thinking, and problem solving, and creativity, but we, just again, tweaked it a bit and said to the students, "Okay, think of yourselves differently, transform your teams into companies, think of yourself as a company, your team is now a company. How is a company structured? Who's your CEO? Who's your CFO? Who's handling marketing? Who's handling promotion? Who's handling R&D?"

**Jill Zande:** [00:29:21] And I was just amazed at what that little tweak, that little rephrasing maybe of how we presented the competition and what it resulted in. I mean, we would see students, and you probably saw them, too, they'd show up for their engineering presentations in suits and ties, and [indiscernible], and brochures. And they really took that part. And one of my most favorite stories about that is, and again, to your point of bringing in a variety of students, I remember this interview that a videographer was doing with one of our teams, Copiah-Lincoln Community College students, Copiah-Lincoln Community College is in Mississippi. And they were talking to one of the students and they said, "Are you in engineering or physics?" And he goes, "No, I'm in accounting."

**Annalies Corbin:** [00:30:08] Perfect.

**Jill Zande:** [00:30:09] You know what, it's when we realized that they needed someone to handle their budget, so they went to the accounting department and said, "Hey, anybody interested in working with us on this real-world-focused project?". And he raised his hand and he said, and we still have this interview and it was done on our website, "This is the most real-world experience I have ever had. I have learned more than I ever did in my accounting class."

**Jill Zande:** [00:30:34] Not that he is going to go work in a technology company or work in ocean realm, but he has an appreciation for the ocean realm, and ocean science and technology, and certainly, that that could be a potential place for him to work. But more importantly, the value, and I'd like to think longer-term, when it comes to making decisions and casting votes about certain things, that he'll remember that experience and remember what it meant, what he was part of. And I know that will influence his decision whether to support a certain measure for Texas coastline or whatever it may be.

**Annalies Corbin:** [00:31:13] Oh, absolutely. And I would encourage schools, teachers or administrators that might be listening, ROV robotics generally, but ROV in particular is an absolutely wonderful way to lead a pathway program and a mini-state. It's very, very easy to align this program across your state Department of Education, CTE pathway, accreditation, and programs. And the MATE program ticks so many of the boxes within those state programs, including, back to your point, the addition of the company's sort of focus allowed schools to tap into entrepreneurship credit opportunities in ways that they haven't been able to before. And so, I agree with you. I'm really, really excited about that component. We have a team out of Detroit who comes to our Buckeye Regional.

**Annalies Corbin:** [00:32:18] And in fact, I think this team might even be one of those early original teams, the coach who's been involved forever. And this is hands down, I probably shouldn't say it with all my local teams, but I love this team. I truly, truly love this team. And what I love about this team is that they are not only entrepreneurial, but they are scrappy. They come from a school and from a community that doesn't have a lot, and yet, they have been so creative and so innovative, and they have strived to have a community focused to their team, and they can tackle and solve problems like no group of high school kids that that I have seen. And the minute they walk out onto the pool deck, you know they have arrived. And everybody-

**Jill Zande:** [00:33:16] I know this team you're talking about.

**Annalies Corbin:** [00:33:16] You know exactly which team I'm talking about. I'm not going to say it out loud, but they're rock stars. And I have such hopes and aspirations for all the kids who participate, but I see those kids, and I have no doubt they will change the world. And I'm inspired. I'm inspired by what these kids do, and that's awesome to me.

**Jill Zande:** [00:33:39] You know what, I know that team. And two things that your presentation of that team made me laugh because I actually know who you're talking about. But if anything, for us, too, it is a competition, right? I mean, it is, and somebody is going to win. But I think that what we've also tried to do is present it kind of collaborative, make it a community, right? They did rock walking and they looked like rock stars, but you said you were inspired by them, and hopefully, all the other teams, especially the newbies coming in, were inspired as well, right? And so, I remember, oh, gosh, in the early, early days of our competitions, I mean, probably in 2004 or '03 or '04, one of the mentors, who was fairly competitive, said, "Well, Jill, this is more of a collaboration than a competition." Then, I thought to myself, "Well, what's wrong with that?", right?

**Annalies Corbin:** [00:34:38] Yeah, not a thing.

**Jill Zande:** [00:34:39] Having a community to solve these issues, to solve what we're facing right now with this pandemic, it really is going to take everybody from around the world working together, and collaborating, and not competing to help us get through it. And so, I hope and I think that it's often said, and you can appreciate it, that the sort of leadership in the environment comes from the top. And I'd like to think all of us at MATE presented and helped to foster and encourage collaboration and that collaborative friendly competition environment, if you will.

**Annalies Corbin:** [00:35:18] Yeah, we definitely always see that. I mean, not once that I can think of over the years have I watched that not happen. And even our rock star team in Detroit, they're veterans because they've sort of built the pipeline of their program, and kids look forward to being able to join the team when they get to high school. And the team has spun off into many components of the team because there's now more kids and whatnot.

**Annalies Corbin:** [00:35:45] And what I see from them, those veteran teams, is they are the first to say yes when another team asks for help or how did you do that or could I learn how to do that or could you show me? And that's the kind of thing that I see over time with these teams back to that, very, very collaborative, and they fully recognize the value that the community has from an expertise and experience component. And you can't underscore the value of that.

**Jill Zande:** [00:36:23] Yeah. No, thank you. And it's interesting because it also made me think of when you said they're scrappy. I mean, resourceful.

**Annalies Corbin:** [00:36:29] Very scrappy, I love them. I think they built their ROVs in a tool shed out back behind the school, somebody told me. So, they're scrappy. I love them.

**Jill Zande:** [00:36:40] Very MacGyver-esque. Well, that-

**Annalies Corbin:** [00:36:41] Yeah, they are very MacGyver. That is a great way to think about them, yeah, I love it.

**Jill Zande:** [00:36:45] But that really goes back to two people. One of them being Marty Klein, and if he hears me say this, he will cringe because he really hates this acronym, but he's really a fan of the KISS principle. And I know that means, well, keep it simple, students. And so, I'm not sure if he still appreciates that acronym, but it is about really keeping it and being resourceful, not overthinking, and making it complicated. There is value, of course, learning the more complicated and complex technical skills.

**Jill Zande:** [00:37:22] But when it comes to building something that functions and works, that is reliable and robust, really, being that MacGyver type. And also, harkens back to Harry Bohm, who was like early mentor in all of this, Harry Bohm and his colleague, Vickie Johnson were really the people that got us started in this ROV education world. And Harry Bohm, I've been in touch with them recently and though he's not directly involved with the competition anymore, although he sponsors our Sharkpedo Award every year.

**Jill Zande:** [00:37:54] And Sharkpedo, there's a story behind that, I'm not getting into. But it's interesting, fun story, but that is really about thinking outside of the box, creativity, innovation, and he sponsors that award every year because that's what he was about. When he would come down to Monterey, he's based in Vancouver, Canada, and help us begin to frame out our educator workshops, and our curriculum, and the way we delivered information, he was always about encouraging us and the teachers we worked with to look at things and see things differently.

**Jill Zande:** [00:38:29] I mean, he would take our teachers and ourselves to the Home Depot or hardware or something, and take us down these aisles and say, "Just look at something and think about a different use for it." If you ever see some pictures on our Web site, yes, that is a kitty litter scoop that's at the front of one of our ROVs because it was the perfect tool to pick up X, Y, and Z, whatever we had, missions they are on. So, just giving a nod to Harry.

**Jill Zande:** [00:38:58] To Harry, he loves those types of students and teams because that's kind of his background, and not coming in with his history in growing up, and not having all the resources, and a ton of funding. You've got to be resourceful, and looking at things, and using everyday items in new and innovative ways. So, nods to both of those individuals for—I know that they heard you describe that team, they would know who that team was as well because they've been around from the early days.

**Annalies Corbin:** [00:39:29] Yeah. Yeah. Well, and what you're talking about is the essence of innovation, and we want all of our citizens of the world to possess the wherewithal to have the confidence to innovate and solve problems in real time. So, I, again, appreciate the program for all that it fosters and kids. As we get ready to close here, Jill, I have no doubt that teachers and schools who have been listening to this conversation that we're having today are asking themselves, how do we bring MATE to our school? So, very quickly, let's close with that invitation. And how do schools do this?

**Jill Zande:** [00:40:13] Sure. Well, we have those 40 regional programs across the country and around the world and we have a wonderful website. And if I'm able to, I'll give that, if you don't mind, I'll give that URL, it's [materovcompetition.org](http://materovcompetition.org), all one word, all lowercase, [materovcompetition.org](http://materovcompetition.org). You can search there and look

for the regional program near you or you can reach out directly to me and I can point you to people who are close by or point you to nearby educator workshop, student outreach.

**Jill Zande:** [00:40:48] We do have, I mentioned, the kits and curriculum we have. Those are great resources. We try to keep the costs on those low. You're able to purchase those from us. But another thing about our competition is you're not required to use our stuff. You can use whatever platform, you can use that kitty litter scoop. You don't have to get what we have in that store. So, certainly, have folks reach on. And just one thing, Annalies, I alluded to earlier are our future directions.

**Jill Zande:** [00:41:15] You mentioned, I am the associate director and Co-PI of the MATE center, and that really gives a nod to our NSF roots, but back in, oh, gosh, late 2016, we actually founded MATE II, which is MATE Inspiration for Innovation, which is a vital 1(c)3 nonprofit. As you can imagine, NSF has been fantastic to us, but one thing that they encourage, and rightly so, is to look at sustainability and diversifying our revenue, if you will, springs, and bringing other funding, and we've been able to do that, but we realized that with vital 1(c)3 status, that would open the doors to so many other potential funding sources.

**Jill Zande:** [00:41:57] And so, again, we just did that late 2016. MATE II is still in its infancy. But really was set up and the purpose is to help sustain this program into the future. And I have to give a nod to the National Science Foundation and certainly, the Marine Technology Society's ROV Committee. I neglected to mention them earlier, but it was really their outreach to us, and their inspiration, and their idea to create this competition in the first place. I know there's some debate about who actually came up with the idea.

**Annalies Corbin:** [00:42:30] Well, we're going to give Marty credit because he likes to talk about it.

**Jill Zande:** [00:42:34] Exactly. But the Marine Technology Society, it's a wonderful resource, especially if students get into high school, and they have wonderful scholarships. So, they've been a fantastic partner. And I should say that a number of our regional programs in the US are actually carried out and organized by Marine Technology Society sections in those regions. The Puget Sound in the Seattle area is one example. And again, they should outreach to us, let me know. That's part of what I enjoy, is hearing from people and making connections, right? Making connections to people that are in their region, in their area. If it's not a regional coordinator, we're bound to have a team like the team that you described in Detroit who is willing to help out and help others to get started.

**Annalies Corbin:** [00:43:25] Absolutely. And I will echo all that you just heard from Jill. We will post resources and links and contact information on our website for the program. And if you have questions, reach out to me, and I will redirect you if you didn't get there directly back to Jill. And just encourage any school, community, after-school group, you name it, to take a look at the MATE ROV program and join us all underwater because we would love to meet you there. So, thank you, Jill, very much for joining us today.

**Jill Zande:** [00:44:00] Oh, Annalies, thank you so much. I've enjoyed speaking with you and your audience. And take good care. And yeah, we hope to see more students underwater with that.

**Annalies Corbin:** [00:44:10] Absolutely. Thank you for joining us for Learning Unboxed, conversation about teaching, learning, and the future of work. I want to thank my guests and encourage you all to be part of the conversation. Meet me on social media at Annalies Corbin, and join me next time as we stand up, step back, and lean in to re-imagine education.