



Jim Bruner

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Annalies Corbin: [00:00:12] 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 reimagine, rethink, and redesign our educational system.

Annalies Corbin: [00:00:46] So, as always, I'm super excited about our episode today, and today is actually a real treat for all of us at Learning Unboxed because we are going to talk about #ProjectMartian, and we're going to talk about Project Martian and we'll get into the nuts and bolts or into the weeds, if you will, of what that all means because my guest today is the Sultan of Systems, Past Foundation's own, Jim Bruner, who is also the Project Director of Project Martian, which is a collaborative project between the PAST Foundation, the PAST Innovation Lab, our SOIL Lab project, which we'll also talk about, and one of the most amazing gems in the city of Columbus, an urban farm called Mezzacello, which happens to be Jim Bruner's passion project and his urban farm. And what's happening at the intersections between STEM, applied teaching and learning, urban sustainability, and food and food scarcity in the midst of a global pandemic is one of the epic stories that I think that we should be collectively sharing. So, Jim, welcome to the program.

Jim Bruner: [00:02:08] Thank you. What a nice introduction.

Annalies Corbin: [00:02:10] Yeah. And we're absolutely excited to have you. So, let's start, Jim. So, Jim, Project Martian is actually the culmination of a number of different PAST Foundation initiatives with a variety of different partners across the state that ultimately sort of led to the staging that got us to Project Martian. So, I want to start with the sort of originator or the foundational piece of this project, which is something we did many years ago now called the SOIL Labs, a collection of labs that in partnership through a straight A program, which is an Ohio Department of Education funding mechanism that no longer exists, we were able to do this project called SOIL. So, let's start with that, Jim, because that's how you came to PAST. So, tell us, what the heck is a SOIL Lab?

Jim Bruner: [00:03:03] So, the SOIL Lab is an acronym. It stands for STEM Outdoor Innovation Lab. And they were nine schools around Ohio that we wanted to create an outdoor classroom focused on ecologies and agriculture just to get teachers an opportunity to teach hands-on learning in an environment that they owned, and was relevant and authentic to the students. And my job was to facilitate the building of those and to manage buying of materials, the implementation of materials, to offer my insight as an urban farmer to these

teachers. And it was a wonderful, wonderful program that culminated with each school spending one week at an away camp on Kelleys Island Field School to see a true isolated ecology in action.

Jim Bruner: [00:03:49] And the kids loved it. So, the SOIL program was really interesting because the kids could see the connection between the urban or the growing environment and food, but it wasn't sustainable because the school schedule didn't reflect what Mother Nature needed to make food. So, that was an interesting reality for me. And that was the culminating point when I decided to turn my garden into a STEM Outdoor Innovation Lab. That's why Mezzacello functions the way it functions now because I took all the lessons I learned from these teachers and all the failures I learned from these teachers, and I implemented them in my private garden because I saw how easy it was. It just needed time, and guidance, and attention.

Annalies Corbin: [00:04:35] And so, ultimately, though, you didn't originally, so when you came on board to do SOIL, let's be really clear with folks, Mezzacello, as we understand it today, and we're going to talk about what that means today, that is not what that place was, right? You garnered and you gained a tremendous amount of insight and inspiration from what you were experiencing helping schools establish these outdoor learning spaces.

Jim Bruner: [00:05:03] That is a fact. I had a garden and some chickens, and I turned that into a self-sustaining enclosed across a series of ecosystems to support life based on what I was watching in these teachers try to teach these children. I went to the logical next conclusion, and I said, this needs to be done year round. You can't walk away from it. And that is why Mezzacello exists in the format it exists now, completely inspired by the work these teachers were doing and the project that I was managing.

Annalies Corbin: [00:05:33] For our listeners in other parts of the world, so keep in mind that the City of Columbus is an urban city in Ohio, in the Midwest, in the middle of the United States, and Mezzacello is an urban farm that literally sits in the heart of the downtown ecosystem that is Columbus. And so, just to be really, really clear with folks, we're not talking about agriculture or farming in the traditional countryside sense, we're talking about an endeavor that's tied to agriculture, and food, and sustainability, and STEM, and science, and you name it, because, quite frankly, our gentleman farmer, Jim, brings everything to bear. But this is happening inside a city environment.

Jim Bruner: [00:06:25] Twelve blocks from the state capitol, right down the-

Annalies Corbin: [00:06:27] Perfect. And how awesome is that? Right? And actually, Mezzacello is a really, really fun place to go because you're not expecting to see that 12 blocks in a downtown capital in a US city necessarily. So, that part, it is really intriguing. So, let's fast forward just a little bit to sort of give some context to our listeners. So, we started the SOIL project, and then in the late summer of 2015, PAST Foundation purchased a 32,000 square-foot warehouse to turn into an education R&D prototyping facility.

Annalies Corbin: [00:07:03] There are pictures that will be posted with this podcast on the website. You can see it. It is an amazing education R&D facility. But to sort of set some stage when we were in the midst of the construction, construction got delayed. We had already partnered with a local school partner here in Columbus that we've been partners with for a very long time called Metro Early College High School, which is a STEM high school, which has some workforce development or early college pathways within it.

Annalies Corbin: [00:07:36] And part of our partnership agreement on building the Innovation Lab was that those pathway programs, those early college STEM experiences would come and live inside the Innovation Lab with the PAST Foundation, and we would iterate and be creative together. Construction was delayed, but school had to start, kids showed up here anyway. And in the midst of all the construction, what we did was we

took four learning labs, one called Bodies, which was about health care, one called Growth, which is around agriculture, one called Energy, which is around sustainable and alternative energy, and one called Design, which is robotics, engineering, and manufacturing.

Annalies Corbin: [00:08:17] And we took all of those kids who are going to be in those pathways and we put them in the portion of the warehouse that was not going to be renovated in that first phase of renovation. So, constructions happening in this building and workforce development pathway programs, early college happening in the building, kids are all mixed, everybody's displaced, and yet it's one giant, happy, crazy, wild place, which is where something remarkable happened, as kids in the Design learning lab are doing their thing in robotics, manufacturing, engineering, and kids in a Growth program are thinking about food and sustainability, and kids in a healthcare program are thinking about and learning health care.

Annalies Corbin: [00:09:04] And then, when left to their own devices, Jim, share with everybody, because this is the remarkable moment, to set the stage, for me, personally, for the fact that when you create a place, and you allow latitude inside that place, magic can happen when the adults step out of the student's way. So, Project Martian was born, quite frankly, in this moment. And I know this is a moment you are passionate and love as much as I do. I'm sure folks can hear that. So, Jim, tell us about that moment.

Jim Bruner: [00:09:38] So, originally, it started out as an engineering project for the Design students to build a Martian lander and a rover. And so, they created this Martian environment, which was five meters square on each side. So, 25 meters total. And they filled it with lava rock that they got from Mezzacello because I had some leftover from hydroponic system that I had built. And when the Growth kids saw this, they wanted a piece of this.

Jim Bruner: [00:10:04] So, they came up with a strategy for using these clear 39-liter, 20-gallon boxes as greenhouses that they would ship to Mars, and fill with dirt, and fertilizer, and seeds, and then water it regularly, robotically to see what grew. And then, the Bodies kids and the Energy kids got involved because they wanted to know how much energy this required and the Bodies kids wanted to know, well, how much good health can you maintain from the food you're growing there. And so, it was all organic. This happened organically. And the teachers just went with it.

Annalies Corbin: [00:10:39] So, literally this was kids in the engineering and design program who had been tasked with an instructor, right? Here's what we're going to do. We're going to actually deploy, and this, for folks who have heard other Learning Unboxed, this is our own Dr. B, who was the Design teacher at that time. And so, the only part that was initially led by an adult teacher and instructor was the setup of these design students having to build prototypes for rovers for Mars.

Annalies Corbin: [00:11:11] And the kids, as part of it, replicated what they believed in the train, they wanted to make this all really real. And the other kids who were in and around because we were in such close proximity all back in the warehouse because the rest of the building was being constructed, all these kids were literally really close together. So, they had eyes on what the kids in one program were doing pretty much all the time. And they organically made the decision, hey, we want to add to your experiment over there without the adults, really, ever getting involved.

Jim Bruner: [00:11:40] Exactly. Precisely. And the things they were doing were so remarkable, like the Energy kids were guiding the Growth and Bodies kids on how to use a tellurometer. They were actually showing them how to burn the food to get the calories. They were collectively working together, bringing the knowledge that they had from their courses at OSU and their studies in their particular learning lab to bear. That was the most impressive thing I had seen in education to that date, and that stuck with me.

Jim Bruner: [00:12:11] And the other thing that stuck with me was that the Design kids and the Energy kids were saying, the dirt you want to send to Mars is too heavy, your payload is going to be over, you can't send dirt. So, what are you going to do? And so, they were really struggling to figure out what they were going to use. And they came up with peat moss, and a little bit of dirt, and then the rest was water. And that was their weight limit because the design kids were like, no, you have a 120-kilogram weight limit, period. That includes your greenhouse.

Jim Bruner: [00:12:42] And watching these kids brainstorm and really just scramble, and by the way, they were all influenced by Andy Weir's novel, *The Martian*, and the movie had just come out. So, this was all extremely relevant to them. And that idea stuck with me. And it was in the back of my mind, in the back of my mind. And then, COVID came and I had the opportunity to relive it. And it was an important lesson for me, watching these kids learn to learn in real time based on something that they were interested in. And the adults got out of the way and the things they learned were absolutely remarkable and influencing.

Annalies Corbin: [00:13:22] It was remarkable. Oh, absolutely. And it influences us today right here at the Innovation Lab, when we talk about the great successes of when you create a thing like this, what can happen when you do that? Right? And literally, as we do tour groups, because folks come from all over the world to see the PAST Innovation Lab, and we're wicked proud of it, but we also love to share those great success stories. And we talk to this day about what happened in that winter of 2015, that fall of 2015, when we give that tour, we talk about that remarkable piece.

Annalies Corbin: [00:13:56] And so, let's fast forward then to 2020, right? Because the 2020 for the whole world has been an epic year, and it's not over yet, but it's been an epic year. And one of the things that we were going to be doing, and just for the sake of understanding for our listeners, we have a very active urban agriculture program that we run here at PAST Foundation in partnership with Mezzacello, and we've been doing it every year sort of since they all came online. And the summer of 2020 was going to be no different.

Annalies Corbin: [00:14:30] In the spring, the students in the Growth program, they interact outside in the SOIL Lab that's here at the PAST facility. And then, we run summer programming and we had a whole host of summer programming that we had planned for 2020, then COVID-19 comes along and none of that's going to happen. We're not allowed to have any kids, we can't interact with kids, and yet these two ecosystems that we've built still have to be worked and maintained, and we have a couple of grants with deliverables.

Annalies Corbin: [00:15:01] So, this is where I love the staff at PAST, and Jim in particular, because there is not a moment wasted, an idea too small or too big for us to contemplate or an opportunity where we can innovate and still get some done. So, rather than saying COVID came, and all of a sudden, now, we can't, Jim Bruner said, Oh, but we can. And so, tell us, Jim, about the 2020 iteration, which literally is the birth for us of Project Martian.

Jim Bruner: [00:15:32] Yeah. This is exactly it. My plan, starting in March was going to be to develop the growing beds so that students could explore integrated ecosystems using manure, using lasagna gardening, and organic materials to create rich, robust food beds. Well, when we had to pivot, I didn't see a problem with that because Mezzacello had already been doing all these things for four years. And I've been exploring this over four summers, how we were going to do this.

Jim Bruner: [00:16:03] So, I was confident we could get this done. And so, I just reframed the problem, which is at the heart of what applied STEM is, reframe the problem. What we had were five beds that we were going to use to grow food, but instead, we decided to create Martian compost generators and we just turned these

eight foot by six foot beds into compost heaps, all from the area that I live in, in downtown Columbus, people mow the grass, rake the leaves. All the waste from Mezzacello came in 20-gallon buckets to PAST and I started building compost generators.

Jim Bruner: [00:16:39] And then, I created a seeding liquid from ethanol, and cola, and ammonia, and a little bit of salt, and that process, the compost down, eight cubic meters of compost over a summer. Eight cubic meters. And now, those beds are ready for seeding with life. And the experiment I've been running at Mezzacello when we pivoted for this grant was creating Project Martian, which would be a Martian bed, using all the resources that we could ship easily. Remember that lesson from that first Martian project in 2015? Dirt is too heavy to ship from this planet to another.

Jim Bruner: [00:17:22] Mars has dirt, but it can't sustain life. So, just send compost. And that's what we did. I built compost beds that are now zero dirt beds that will sustain life. All I have to do is add an additional cubic meter of regolith, and in this case, a diatomaceous earth. It's the same weight, it's the same sharpness, it's the same size as Martian regolith, and it's a great way to experiment, can Mars sustain life if we give it all the chemical and mineral processes it needs? And the answer at a Mezzacello has been a resounding yes, and it will bring yes here as well, and I'm really excited to get that started, and that starts on Monday.

Annalies Corbin: [00:18:02] Yeah. And it's been an ongoing process. And just so that folks understand, so everywhere that we could, despite the pandemic, and everything that we do at PAST involves students by design, right? And so, as soon as it was safe to do so at the Mezzacello location, you actually opened that up to some small working groups within the community that you've been working with for a period of time now tied to urban agriculture, and food sustainability and scarcity issues, which are very, very common in urban settings, right?

Jim Bruner: [00:18:38] Yeah.

Annalies Corbin: [00:18:38] So, let's talk a little bit about the community and avocational sort of influx because you are learning right alongside them. As you bring the community in and show them what's happening in this urban farm setting, they're asking you questions, which many of them you can answer, but many of them also are that sort of spark of the next sort of thing, understanding what do the students want to know more about? What does the community want to know more about? Where is the sort of push and pull points from the teaching and learning standpoint?

Annalies Corbin: [00:19:07] Because the next piece, sort of the end piece of this is, as we then restart the program, there will be an awful lot of the learning that's come from Project Martian that has to then be translated into actual modules for schools, teachers, informal, formal, you name it, around the globe, grab these modules, and when they're ready, they will go up on the PAST Foundation website and start recreating this program in your own community, tailored to you. So, let's talk a little bit, Jim, about that sort of short-term space of where and how you brought the learning in at a time when learning is really difficult.

Jim Bruner: [00:19:48] So, the thing about Mezzacello, and you'll see it when you see the pictures, is that the ecosystems are separated by vegetation, and trees, and fences. So, it's really easy to guide people through it, kind of like an ecological maze. And the same is true here at PAST, we can socially distance here at PAST quite easily. I had already established a relationship with the Bronzeville Agracademy before COVID started and I was going to use them at PAST as well.

Jim Bruner: [00:20:16] But these are at-risk kids in foster care and an extremely low, free and reduced launch programs that were working with Julialynne Walker on understanding community gardens. And Julialynne

came to me, and said, I'd really like to show them how you build a farm from life and just from waste materials without having to rely on the community, one organization, you could do it yourself. And so, we formulated this plan and it tied in beautifully with Project Martian because I could do six people at a time and I had instructors that could guide an additional six people, nicely social-distanced, and we just explored these ecosystems over three different periods.

Jim Bruner: [00:20:59] In addition, I also have homeschool families in Olde Towne East, which is where I live in Columbus, Ohio, that they bring their kids collectively through, and we give tours, and explain systems, and answer questions. And the kids ask really great questions. And I'm able to answer them or admit, I don't know, but we need to, and let's learn together. And that is what mentorship and education and the future of education really, actually looks like. There's no one person that can do everything, and that one person that has everything isn't accessible.

Jim Bruner: [00:21:31] Kids don't want someone lecturing them, they want to be part of the solution. And that's one of the beautiful things about the PAST Foundation and our link in learning to life modality is that we don't need to know everything, because collectively, we're smarter than one of us can ever be. And kids need to see that. They need to feel that. They need to grow those networks. And that's really the most surprising thing that's come out of Project Martian for me, is the growth that happens across both sides, the educator and the educated, they switch roles quite often. And those are the best lessons because I grow from it, and they grow from it, and life comes from it.

Jim Bruner: [00:22:10] And the other really interesting thing is two of the kids in the Agracademy are from Ghana. And they were looking at my gardens, and they said, we could do this right now in Ghana. This is so obvious. We have everything, but no one's ever told us, put these things together and you can make something even more remarkable than a community garden. And they took that home. And on Zoom calls with their families, they've been sharing that around the globe with family members. You need these things, and if you do this, you can make a garden work in two months. That's nice.

Annalies Corbin: [00:22:49] Right. Yeah. No, that's absolutely wonderful. And so, share with us just a little bit as we get ready to sort of wrap here, what is the content of these modules? And I know that work is happening right now, right? But you have a plan for them. So, what sort of module activities are going to be in this list? Just so that folks will know because we want them to come and download them, use them, and then correspond with you because your offer to the world is, hey, not just take this thing and do it, but take this thing, do it and let me be a mentor to you along the way, reach out to me, I love engaging broadly, it's how we know and measure our impact. So, what would folks be able to find when it's all ready to go?

Jim Bruner: [00:23:35] Yeah. So, a couple of different things around cross-disciplinary, transdisciplinary learning. One of them is a program called manage your crops, which breaks down all the critical elements needed for life to happen. And another one is water purification, how you purify water for drinking, how you purify water for plants, and how you purify water for animals. Another one is animal husbandry and how you use animal waste effectively and legally within city constraints because I do live in downtown Columbus.

Jim Bruner: [00:24:06] I have permits to do this, but anybody could do it, just understand the system. And then how I built the Martian beds, how you do lasagna gardening, how you have a zero-dirt garden, what are the requirements, and the other one is, which I was just filming this morning, it's called weeds as food. And all the weeds in your yard, what their nutritional, and vitamin, and mineral matrixes are, and how you cultivate them as a source of food. Instead of seeing them as an enemy, integrate them into your ecosystem.

Jim Bruner: [00:24:39] So, there's a couple of others around methane generation, how you can create fuel, but the obstacles to doing that actually are how to use solar power effectively, water power effectively, and how integrated ecosystems provide resources for each other and mapping that in a classroom. What does the water have to do with the ground? What does the ground have to do with the animals? What does the microfauna have to do with the animals and the ground? So, it's kind of a puzzle put together. Those are the kind of modules I'm building. There are more. I can't remember all 10 of them right now, but-

Annalies Corbin: [00:25:13] Well, and all of those, just so our listeners know, they are going to be standard-aligned to NextGen and Common Core, which is US-based. They should be very easy for folks in other parts of the world, instructors, if you need to standard-align it to your own to be able to do so. And it's very, very integrated across disciplines. There are going to be suggestions for extensions and what to do with it, very typical of the way that we create our curriculum and the modules that come out of all of the PAST programming. So, definitely, be sure to check back. We'll keep everybody posted in terms of when all of that's available.

Annalies Corbin: [00:25:50] So, as we wrap up, Jim, two things, so the first one is what's the next aspiration for this piece? That's one. And then, the second is I am a teacher in a small community or I am an informal educator in another giant urban center in completely another part of the world, and I hear this, and I'm intrigued, and I know this would be a great thing for me, as an instructor, my students, and my community, but I just have no idea, the one or two things necessary just to get started, because it sounds like this amazing, epic thing, but it also sounds pretty darn daunting if you don't have someone standing there with you to help you get through. So, those two things, the aspiration, and then how would I start on my own?

Jim Bruner: [00:26:44] So, my aspiration for the next phase of Project Martian is to develop a kit that any person in any community could use to turn the densely populated urban environment, which is usually clay, let's be honest, 150 years, it needs to be amended, what the steps are, and very discreet ways of what you need to do that, how to make that work, and what systems you need to have in place. The second one is I want to reframe the idea of a community garden and reframe the idea of gardening altogether in terms of, you need to think about gardens as, yes, land, and food, and resources, but also, people.

Jim Bruner: [00:27:27] Reframe the way you think about people, and connections, and resources, and who you know, and what they have, and asking the right kinds of questions to get the results that you want rather than asking for this or that. Look for types of people to plant in your favor to get things done because you cannot walk away from it. The moment you turn your back on Mother Nature, she moves on. And that's a lesson that I think people need to understand. The Earth is not automatic. It requires intention, action, and impact. And if you don't give all three of those things, you're going to get very limited returns and you're going to see a garden wither. We've all seen gardens wither.

Annalies Corbin: [00:28:07] Oh, absolutely. And school gardens are notorious for that, right? We have these great intentions and we take care of them, and then we all, at least in the United States, largely, we leave in the summer, which is the prime growing season, and there's no plant. And we come back in the fall with our kids and we start all over again, we have these great aspirations, and then comes the following summer, we walk away, and nobody waters it, nobody harvests it, it's a real lost opportunity, not to mention, it is an ecological waste.

Jim Bruner: [00:28:37] So, reframing the problem, when I say that, I mean that I want to not create a community garden, a place where people go to plant food, I want to create a machine for life that you understand has a life longer than when you're there. And that's the garden that I want to build, the garden of

people, and ideas, and resources, and mentorship. So, that is my next aspiration, creating machines for life within the city that grow food with little effort, a deep understanding.

Annalies Corbin: [00:29:10] And how do other people get started with this?

Jim Bruner: [00:29:12] Using the modules that I'm building now as part of Project Martian and finding ways to connect with people beyond just making food, that's only a third of that equation. You have to develop the ecologies. You have to develop the systems of relationships that will sustain this through the winter. What do you do with a garden over the winter? Most people don't know. What do you do with the garden in late summer? Can you plant a garden twice? Yes. In some parts of the world, three times. Understanding all those things is my next aspiration. It's bigger than just planting or harvesting.

Annalies Corbin: [00:29:50] Perfect. Yeah, absolutely. Jim, thank you so much for joining us today, sharing about Project Martian, what's going on. And actually, I'm hoping that this time next year, we can circle back around and have another conversation about what happened because it's a really, really active project and it's one that I think is going to be really, really important. So many valuable lessons.

Annalies Corbin: [00:30:14] And I think that in the midst of folks scrambling with how to make up gaps that may have emerged as a result of the pandemic and the way it disrupted teaching and learning that one of the other big giant lessons that are coming out of Project Martian is that we can regroup, and we can rethink what we teach and how we teach it, and what's really, really necessary. And by engaging and inspiring our learners in the middle of the teaching, that we can actually bridge gaps a lot faster than folks. I think we can because it's so hands-on. There's passion behind it. So, thank you very much for sharing this with all of us today and best of luck on your journey.

Jim Bruner: [00:30:58] Thank you. It really was my pleasure. I love this project.

Annalies Corbin: [00:31:01] We love it, too, Jim. So thanks, everybody.

Annalies Corbin: [00:31:06] Thank you for joining us for Learning Unboxed, a 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 @AnnaliesCorbin and join me next time as we stand up, step back, and lean in to reimagine education.