



## Andy Farke

**Andy Farke:** [00:00:00] Broad expanse of time makes this moment that we're living in all that much more meaningful. It's like, wow, we've got this time on Earth, let's do something with it.

**Annalies Corbin:** [00:00:14] 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:** [00:00:49] So, I am super excited today on Learning Unboxed because we have a guest who has been a bit of a legend for me over a number of years because I was first introduced to Andy Farke, who's joining us today, when I went to work in Armour, South Dakota on a school's project. And the reason I was introduced to Andy way back when was because he was sort of a legend in the small rural community in the school because of the amazing things that he went off to do.

**Annalies Corbin:** [00:01:18] And today, we get to talk with Andy about his work as a paleontologist educator, who works with dinosaurs, but involves high school students in the scientific research process. And that is so near and dear to my heart. I just can almost bow down and be grateful to Andy and his work. And so, Andy is a paleontologist with the Alf Museum and he will explain the work with the Alf Museum, and The Webb Schools, and his own field work and interest with students, how that all sort of comes together. So, Andy, welcome to the program.

**Andy Farke:** [00:01:50] Thanks. It's great to be here. What I do is I'm a paleontologist. I'm an educator. And I have just like the best job on the planet. I get to work at a museum where we're making new scientific discoveries all of the time. But even more exciting than that is we have high school students involved in every step of the process. So, the Raymond Alf Museum of Paleontology in Claremont, California is unique in that we're the only nationally accredited Natural History Museum, Paleontology Museum that's located on a high school campus. And that's the campus of The Webb Schools. We have the students do everything with us as part of the process.

**Andy Farke:** [00:02:28] So, they go out in the field with us to find new fossils. They help clean them and conserve them in our fossil preparation lab. They are helping. And in many cases, outright doing the research on these fossils to understand what they mean. And then, taking it out there into the world through telling people about it, through events for the general public, but also by presenting at major scientific conferences and publishing in peer-reviewed scientific journals.

**Annalies Corbin:** [00:02:57] So, that's the big piece of this that I love so much. So, a lot of folks who listen have heard me mention before, my background as a research scientist is an underwater archaeologist. And so, very, very similar in the sense that the thing that gets me jazzed is that you've made a point in the way this whole arrangement works to say that high school kiddos not only could benefit from, hey, being part of what's going on, but more importantly, actually have real roles, meaningful roles, not just busywork, not just, hey, let me show you a career, but honest to goodness, I believe that you're capable of doing this, and if you're not, I'm going to teach it to you, and we're going to often run it, you're really going to be part of my team.

**Annalies Corbin:** [00:03:38] So, tell us a little bit of the context piece. So, which came first, the Alf Museum or The Webb School? And then, how did those two sort of get connected together? Because you're right. It's amazing that the museum and the high school are all kind of one and the same in that sense. So, help the listeners understand the context piece, because I think that that obviously has influenced so much of what you're able to do as it relates to having these kids very much by design, deliberately part of your team.

**Andy Farke:** [00:04:07] Yeah. So, our museum was founded by its namesake, Dr. Ray Alf. He came to Webb as a science teacher back in the 1920s, in 1929. And he timed in because it was a small school then and still a small school, he did a little bit of everything. He taught science, he taught math, he coached some sports. But one thing he was really increasingly interested in was the world around him. So, he was an amateur astronomer. He built a telescope by hand in the 1930s. And he was also increasingly fascinated by fossils. So, what he called the documents of life.

**Annalies Corbin:** [00:04:48] I love that.

**Andy Farke:** [00:04:49] Yeah.

**Annalies Corbin:** [00:04:49] That is a great way to think about it. That's spectacular.

**Andy Farke:** [00:04:51] Yeah. And I mean, he was just a master educator. I've talked with students that in some cases, 50, 60 years after, they had him as a teacher, and they still just remember him as someone very dynamic, someone who really had a gift for teaching difficult concepts, and who had a gift for making students feel their part in the bigger picture. One of the questions he would always ask is, what are you going to do with your moment of time when you look back across this vast geological span of time?

**Andy Farke:** [00:05:25] And his way of placing us in that moment of time was to go back in time by collecting fossils. So, in the 1930s, 1936, he was out in the Mojave Desert with some students and they found a skull of an animal that turned out to be a species that was new to science. It was, I think, both peccary or javelina, a pig-like animal that was given the scientific name of *dyseoehyus fricki*. And this discovery and a few others that they made around that same time really energized Alf and got him thinking about the role that fossil collecting, and fossils, and the study of geology and evolution could really be an educational vehicle for his students.

**Andy Farke:** [00:06:06] So, they started going on these things called peccary trips named after that first fossil they found. And one thing led to another. They started building this big fossil collection, some of which had some real scientific significance. And many of his students were inspired to go on to careers in the sciences, engineering, and other fields. And even those students that didn't necessarily go into the sciences, a lot of them talk about how having that bigger perspective, it really has grounded them and given them a different way of looking at the world.

**Andy Farke:** [00:06:39] So, that's how that got started. And then, our museum building itself was built in the late 1960s. And then, after Alf retired, the museum was professionalized, really, from being a personal

collection to something that's a much broader scientific facility. So, that includes having all the proper storage, cabinets, and technology for that, having the labs, and the staffing, and all that to really make it not just an educational collection, but something that's a scientific collection for the outside world, too.

**Annalies Corbin:** [00:07:13] That is absolutely awesome. And I'm so jealous. I mean, I am truly, truly jealous. As one who loved my own scientific field, and field research, and engaging with the act of discovery and the unknown, right? So, to me, that's the passionate part. That's the reason I went into what I did. Because I loved the digging. I loved the discovery. But I am gathering that this is part of sort of your persona as well, I loved the sharing of that knowledge, right?

**Andy Farke:** [00:07:46] Yeah.

**Annalies Corbin:** [00:07:46] The teaching. So, the learning from myself as a professional, and then the teaching of my students, but also the learning that I got from my students as they learned how to figure this stuff all out, those were some of my very best days in the field, right?

**Andy Farke:** [00:08:06] Yeah.

**Annalies Corbin:** [00:08:06] So, I totally love and appreciate that. So, The Webb School came first, and then the museum was built around this great, phenomenal teacher. And I have no doubt that there have been fabulous teachers in your experience that sort of helped you along the way. I can certainly say the same. And I think that, that story that you share about these students all these years later, that there's something to be said about not just a dynamic teacher, but a dynamic environment where you have the opportunity to grow and to explore. And one of the things that I loved about what you put in the bio information that you sent over for our interview was the fact that you recognize that not every kid that you interact with is going to be a paleontologist, nor is it even your goal to make them a paleontologist. But the experience is giving them so much more.

**Annalies Corbin:** [00:08:55] So, I guess that one of the things that I would really love to sort of dig in a little bit is when the students come, and they actually get to sit down, and start working on a particular project with you, how do you lay that all out? How do you help the kids or do they just come to it because they're at The Webb School, museum is there, that they naturally, by design, understand what their role is going to be here? What's the process? How do you make sure they're ready for the experience you're about to give them?

**Andy Farke:** [00:09:21] Yeah. So, it's a multi-year process, really. So, Webb is an independent school, which means we have some flexibility around curriculum, even though we're aligned in the science curriculum with the next-gen standards and those sorts of things. We have a lot of leeway in how we do that. So, it's really exciting that we're able to, as part of our ninth-grade science curriculum, it's, of course, the biology class that many schools have with ninth graders, but it's an evolutionary biology class.

**Andy Farke:** [00:09:51] And really, I always think of biology best make sense if you're looking at it through the lens of evolution because that explains the diversity of life and all these biological systems. And one really important piece of evidence for evolution is through paleontology, the study of fossils. And so, we start students with basically just every student here gets exposed to a couple of weeks of paleontology as a ninth grader.

**Andy Farke:** [00:10:15] And they see how it fits in with the broader science of biology. And looking at transitions in the fossil record say about how life has evolved. We do a short field trip where they go out for an overnight trip to collect fossils and see like, oh, we've talked about horse evolution. Look, I just found a toe

bone from a three-toed horse. How cool is that? So, they're really seeing that, and seeing that aspect of science, and discovery, and action.

**Andy Farke:** [00:10:42] And then, for students that want to go in a little more depth, they have an open option as 10th or 11th graders to take a yearlong course sequence, the first of which is, it's an honors paleontology class. So, they start digging into more of the details of what paleontology is as a science, a little more depth on the history of Earth, but also alongside that, we talk a lot about maybe the things you don't think about necessarily, automatically on the sciences.

**Andy Farke:** [00:11:10] So, things like how does a museum run? Not just like, how do we take care of collections? That's important, but what are the ethics of it? So, we start bringing in all these topics of like, well, what are the laws in the US or internationally that govern how we collect fossils? Who should have ownership of fossils if anyone should have ownership of fossils? What are all those things? Like what are the ethics of a museum? Should a museum like, if it starts running short on money, should it be able to sell its collections? How does that fit in with the definition of a museum?

**Andy Farke:** [00:11:40] So, we talk about all those sorts of things that are, of course, related to paleontology, but also, speak to broader issues in society and culture in the world. So, they start to see that it's not—my goal is they see it—I'm not just a scientist who's sitting behind a microscope, like I have to think about these that I engage with the rest of the world because honestly, as a museum, like if we want support from our donors or whatever organizations support us, we have to really make a case for what we do, why we're important.

**Andy Farke:** [00:12:13] It's relatively easy in the best cases to get money to like do a new exhibit, but a museum that's only exhibits isn't really fulfilling its mission as a museum. You have to have that collection behind it. You have to have that research behind it. And so, we talk about how all that relates into the broader museum culture. So, that's the first semester. And then, the second semester is basically an introduction to research.

**Andy Farke:** [00:12:37] So, the students learn how to read a scientific paper, how to give basic journal club presentations. So, they'll read something from the peer-reviewed literature, summarize it. They'll do some basic introductory research projects, learn how to write scientifically, and what goes into that, and how that's different from maybe an essay that they've written in one of their humanities classes. And also, with that, of course, we have another strong ethics component because then, it gets really important to have those conversations.

**Andy Farke:** [00:13:05] So, we talk about some of the topics like who does research belong to? What are the ethics of peer-review? Like say, I've been sent a paper that's written by my friends to peer-review, is it ethical for me to review that? And what are the boundaries? So, we talk about those things. And a lot of these are things that tie in with maybe what these students are experiencing as teenagers, but things about academic honesty, things about, how do you relate to your peers?

**Andy Farke:** [00:13:31] So, again, that little bit of relevance there for them. So, they're getting the scientific training as training, really thinking about what are the ethics and the bigger picture of being a scientist. And then, for those students that want to continue on in the program, then they can take up to two years of an advanced research course, where they're working with me or one of our other museum scientists on some new piece of hopefully publishable piece of scientific research.

**Andy Farke:** [00:13:57] So, maybe it's a fossil that the student found on one of our summer expeditions. Maybe it's something that's been sitting in one of our cabinets at the museum. So, we're like, okay, this is a

fossil. We don't know much about it. We've gone through the scientific literature. Nobody knows much about this topic. It's on you now to figure it out. And so, we'll guide them, we'll help them get up to speed on kind of the important bit of literature that they need to know, the background work, and then help them do the research, whether that's measuring specimens, whether that's analyzing CAT scans, whether that's maybe looking for more fossils in the field.

**Andy Farke:** [00:13:57] And then, if all works out well, taking that research to a conference, and maybe onto a peer-reviewed paper. So, really walking by them every step of the way, but also giving them a lot of freedom to run up against those dead ends to see the frustrations of like, oh, I've measured 500 teeth, and it turns out there's no significant results. You're like, we didn't—it's like, that's real science.

**Annalies Corbin:** [00:14:59] Welcome to the real world of science, right?

**Andy Farke:** [00:15:01] Yes.

**Annalies Corbin:** [00:15:01] Absolutely.

**Andy Farke:** [00:15:03] Yeah. And for me, although it's really exciting like when the student is a co-author on a paper that's published or when I see them at a conference, I think it's just important that they see like, oh, science isn't just like, go to a textbook and look up an answer or it's not like I had every day as a eureka moment in the lab at 2:00, which is another sort of way of looking at science that they often see in pop culture. Going and see that like sometimes, there's excitement, but sometimes, there might be weeks or months of just got to slug through it.

**Annalies Corbin:** [00:15:34] Yes, absolutely. Been there, done that many, many times.

**Andy Farke:** [00:15:38] Yeah.

**Annalies Corbin:** [00:15:38] Absolutely. Well, I just love that and I love, this is the sort of epitome, I guess, if you will, of the notion of high school capstone, a research internship that is just saying at the very highest level, we're not just asking you to participate, we're asking you to contribute. And I think that's a fundamental difference in what is going to be a successful, immersive experience for a student, right? And that's certainly the piece that we advocate for and have for many, many years at PAST.

**Annalies Corbin:** [00:16:12] But I do think that it's intriguing to me how often educators generally, and I'm talking about our post-secondary colleagues, as well as our avocational colleagues and our traditional school teachers, I'm using educators to be all encompassing in that sense. We often get stuck in the notion that because we've always taught X this way or we've used this particular curriculum, I love your example of their biology course. The standards in biology, although they have evolved over time, it's largely the same, the foundational pieces of the science we know.

**Annalies Corbin:** [00:16:55] And yet, oftentimes, what we find in schools, and especially in schools that are struggling to engage students in science, if you step back from it, there's two things that tend to be happening. One is you don't have a dynamic science teacher or a teacher who is so passionate about the content or one piece of the content that the kids sort of peel the passion off, right? They know that you love this, Andy. And so, when they hang out with you, there's no question in their mind that you want to be there, right? And that matters. Kids know this stuff.

**Andy Farke:** [00:17:31] Yeah.

**Annalies Corbin:** [00:17:31] And then, the other thing I see is that folks have not taken on a sense of freedom. And sometimes, it's environmental. It's the place you're teaching, or the place you're working, or the museum that you're in that are so constrained that you can't take the content and make it relevant to those kids right now. So, to your point. So, I think oftentimes, when I look at stale programs, those are the things that I see, I guess, if you will, right?

**Andy Farke:** [00:17:59] Yeah.

**Annalies Corbin:** [00:17:59] So, from your experience, other than tapping into the thing that you know and love, how could you help others who want to be able to teach no matter what it is, whether it's paleontology, or it's fashion design, or it's marketing? It doesn't really matter. At the end of the day, you found creative ways to sort of tap into the here and now. And yet, people are afraid to do that. So, what would your advice be in that space?

**Andy Farke:** [00:18:30] Wow. That's a big question.

**Annalies Corbin:** [00:18:32] It is a big question. And I ask it because you didn't come to this, Andy, as an educator. You came to this as a paleontologist who loves to teach, clearly.

**Andy Farke:** [00:18:42] Yes.

**Annalies Corbin:** [00:18:43] And I think, sometimes—so, this is my theory. I have a theory, I guess. So, I want to play my theory out with you. So, my theory is that we need to be able to find a way to help teachers tap into the passion of folks who love what they do, but don't teach. At the same time, we needed to help those folks who are incredibly passionate about stuff and help them learn how to teach others even if it's one or two. It doesn't have to be an additional classroom setting. There's magic in the moment to where somebody can mentor somebody else to love what they love.

**Andy Farke:** [00:19:19] Yeah.

**Annalies Corbin:** [00:19:19] I guess that's what I'm getting at. How do we get to that magical moment in a variety of settings? And you don't have to have the answer, but I know you have insights because you're living this.

**Andy Farke:** [00:19:28] Yeah. So, I think one thing that has really helped me is I am really fortunate to have some amazing colleagues here, not just at the museum, but at the school, and some of them in science, some of them in other departments. And so, just chatting with them to see like, what makes you tick? Like you're a humanities teacher. What is it that like clearly good at it, you have the students energized in your classroom? Like what is it that makes you tick? And often, it's that background passion, that excitement.

**Andy Farke:** [00:20:02] Sometimes, it's coming from just having that experience in the field, that proficiency in the field. But that's why I'm a big advocate of creating opportunities for educators to either go back to what their original topic of study was, if they were a biology major in college or whatever, being able to go back and do that or if they have still some continued engagement with the field, being able to just create those opportunities.

**Andy Farke:** [00:20:31] So, I've got some colleagues out there. There's a great program through the University of Washington where they have educators go out in the field with them to collect fossils. And I think those sorts

of experiences as professional development and professional growth are really important. One thing that makes me really, I think, excited and continue to be excited is I have the ability to be professionally engaged as a scientist. So, of course, I'm an educator, but also, I'm an active research scientist involved with my professional societies and working with these students to make new discoveries.

**Andy Farke:** [00:21:08] But that's a lot of what keeps me motivated and keeps me excited, is being able to have that freedom to do that. And I, of course, absolutely recognized, depending on circumstances of schools or background, that's not always possible. But I think ways to creating ways for those sorts of opportunities for educators to tap into that excitement, that kind of what's current in the field, like that's so, so important. So, that's one thing that I think is important, is just stay engaged as possible in the dirt, whatever that dirt is for your field.

**Annalies Corbin:** [00:21:39] Yeah, that's a really interesting way for you to put it. And I truly, truly appreciate that. And although I have recognized that I hadn't had anybody put a voice to that, but I like the notion of encouraging our educators. So, folks who come, to your point, from those variety of different things that they teach, whether it's language arts, or mathematics, or some type of science, doesn't make any difference.

**Annalies Corbin:** [00:22:07] And through folks who come into teaching through education and not necessarily through whatever that content component of it is, I think often, what might happen and again, a theory, I don't know that this is the case, but I'm curious about it because of the way you put it. So, I do appreciate that. One of the things that might be a sticking point is, you have so much invested in your profession outside of the teaching. So, the science piece. Again, you mentioned your professional association.

**Annalies Corbin:** [00:22:40] Oftentimes, teachers are members of associations or groups that are tied to teaching, but not necessarily their content components in the truest sense. And I wonder if there is a connection there, right? I became a math teacher because I like math, and I want to teach, and I like kids. But is there a component of math that I'm passionate about? And can I figure out how to tap into that as a mechanism to inspire and help teach my kids? And I wonder if maybe that's one of those little levers that we need to spend a little bit more time giving traditional educators permission to invest in their content piece of their field for the inspiration and the passion.

**Andy Farke:** [00:23:23] Yeah, absolutely. Because I think it's that inspiration and that passion that when I think back to some of the best, most-engaging teachers I've had over the years, like even if they didn't have a PhD in the field, they had a natural passion for it. And if someone's excited about something, it's a lot easier to get students excited about it, too.

**Annalies Corbin:** [00:23:43] We used to have these post-it notes that we used to have printed and we would take them to every teacher, professional development workshop that we did. And what they said on them was, teach your passion. And we would start there. And that was the thing that we saw, too, is like, I don't care that you're the math teacher, maybe you're the math teacher and you are a whiz at knitting. Well, okay.

**Annalies Corbin:** [00:24:07] For starters, knitting is nothing but mathematics all played out, right? So, how to get you jazzed, take that thing that you love and let's see if we can help it be at least a springboard with your students because to your point, kids know. Whether they're little kids or they're older kids, they know when you are so completely jazzed and into what it is that you're teaching them, right?

**Andy Farke:** [00:24:30] Yeah. And I think the other thing with that, too, is it comes from showing maybe that I'm not always the expert, letting the—I almost would use the phrase, like showing the vulnerabilities that I have as a human and as a scientist. And I think especially high school students, yeah, we're all pretty cynical

when we're teenagers, and many of us are. I remember being, I knew so much about the world when I was 18 years old. And everyone was trying to sell me a like.

**Andy Farke:** [00:25:05] And I think, one thing that resonates that I found with the teenagers that I work with is if they're like, oh, wait, scientists don't actually know all this like, oh, there's something that's like less than perfect? And that often resonates and gets them excited. In fact, I remember, this is a few years back, one of my students actually had a score chart that he was keeping of times Dr. Farke was wrong.

**Andy Farke:** [00:25:30] And this was a student, really motivated. But we had just like this great relationship where it wasn't subversive in any way, but it was very much kind of like, you just said something, like I'm not sure that's right. And so, he would challenge me and he'd be like, oh, I just found this in the literature that extends what we were just talking about, things like that. Okay. We're going to add another tick mark to this word chart I'm keeping. So, things like that. I think that's really being able to say, I don't know, or let's check this out, or I was wrong about this. I think that often resonates well, especially because as you get to more advanced science learners.

**Andy Farke:** [00:26:12] Because I mean, really, that's what the process of science is, is saying, I don't know this, let's find out or oh, this seems weird, could that be right? And I think having those sorts of relationships, no matter what the class size is that a lot of what teaching is, is about relationship-building. That has to come in order to get student trusts and student engagement. And if there's not that relationship, they're not necessarily seeing you on that on that level as someone that's figuring it out alongside them, can be harder to get that trust.

**Annalies Corbin:** [00:26:46] It really can. And the reality of it is, and again, like I said, from years and years of being in so many different classrooms and communities, that was one of the pieces that we've seen over and over again. And it becomes almost one of those kevlar threads around when you step back and think about those great, amazing, successful teachers who, to your point, 50 and 60 years after the fact, they remember that teacher. And if you really dig in, what you discover is that, that teacher was fearless, right?

**Annalies Corbin:** [00:27:19] They believed without question. And the kids that they were teaching, that they were capable of so many different things, and to go on a journey with them rather than just absorbing information. And I think that, that's a lot of the big difference, and certainly, some of those pieces that I feel very strongly about. The other thing that I am really curious about, because here's what I can imagine, folks are sitting back listening to this, are like, oh, my gosh, Dr. Farke, he's inspiring. Like, I want to be a teacher like that, right?

**Annalies Corbin:** [00:27:52] And how do I tap into some of those pieces? But I'm not in a community that has a school that provides as many of those types of free opportunities. I don't have a museum sitting on my campus, but I'm really, really passionate about X, Y, or Z. And so, I want to start transitioning the way my students think and plan. And how do I go about doing that? I always like to sort of as we wrap a program, think about the things that people are sitting back listening, saying, gosh, I could do that, but-

**Andy Farke:** [00:28:25] Yeah. And that's another big question. That's what I think about a lot. I'm very cognizant of the fact that not every school, in fact, very, very, very few schools have a museum on their campus. Not everyone can just walk down the hallway and pull out a drawer of a new species of dinosaur or something like that. But I think one way that things are getting maybe a little more accessible is, as more museums bring their collections online, and not just museums, but other sorts of cultural institutions, and research institutions, and such, there's a lot of ways to engage with that primary material.

**Andy Farke:** [00:29:02] And I think really, for me, it comes down to engaging not necessarily at the textbook level, although textbooks are useful and really great to get a foundation. But going to that level where the textbook information is coming from, and then even below that to the, like here's the actual data. And I think getting into those sorts of resources where possible, it's been really inspiring for me as a teacher. And I think it's something that is hopefully within whatever local limitations there are.

**Andy Farke:** [00:29:35] It's something that can be adopted, whether it's looking at 3D scans of a fossil online or reading a journal article because there are a lot more journals now that are making their research available online in a way that that's at low cost or no cost. Also, I think, there's different forums where you can you can point motivated students to, to engage with professionals. Yeah. As a professional that sometimes contacted by students outside, that's something that I always advocate with caution because I've seen it go off the rails in all sorts of ways. I think that kind of communication with experts requires some guidance from the teacher, not just saying, go ask a scientist five questions, but-

**Annalies Corbin:** [00:30:17] Right. Oh, no, absolutely. Because, you can get that student that is relentless and you just—yeah, absolutely. Which on the one hand, you love. But on the other hand, within a moderation. So, yeah, absolutely.

**Andy Farke:** [00:30:31] But yeah, I think really engaging with those and seeking out those building blocks of our knowledge, whether that's the museum that has their paintings online or they're in the museum that has scans of fossils online, there's some great databases out there where you type in your geographic location, like what fossils were found in our backyard here?

**Annalies Corbin:** [00:30:52] Yeah, exactly.

**Andy Farke:** [00:30:53] And then, that leads into, well, hey, we're finding—we're in the middle of South Dakota, why are we finding all these marine fish outside here? Because there's a lot of like cornfields and hog facilities. We don't have oysters hanging around today. And so, that kind of that can be a way to really make it personal. And I would say that's the other thing, is find the ways that make it personal, make it local.

**Andy Farke:** [00:31:21] One of the things when I was a student that always inspired me wasn't necessarily reading about a discovery down in Argentina or discovery over in China, but like, what is the discovery that just came out of my backyard? Whether it's a fossil, the famous fossil that was found 50 miles away or maybe a regional university that some researcher just made a discovery. So, I think finding those sorts of local personal connections can make a big difference, too. And often, those are good places to tap for resources, as you know, for getting kind of beyond the textbook.

**Annalies Corbin:** [00:31:59] And they're also a great opportunity for students to understand how the work that they do, whatever that happens to be, could be tied to a community and benefit a local community.

**Andy Farke:** [00:32:09] Yes.

**Annalies Corbin:** [00:32:10] That's the other thing that I love about that approach, is oftentimes, we think about science in particular, but we also see in other fields. But I would say science, for better or worse, is often the victim or the perpetrator, take your pick of some of that ethos that says, this is about something huge. It's not about any small or individualized place. And sometimes, we forget, to your point, that it starts someplace.

**Andy Farke:** [00:32:37] Yeah.

**Annalies Corbin:** [00:32:37] The seed of whatever that—it doesn't matter which field of science you choose, it has a beginning and a certain place. And that certain place has meaning to the entire sort of sets of events and one event builds on another that's tied to whatever that thing is. And we often forget to help the students understand that it's right here. To your point, it's in my backyard, it's meaningful, it has to do with me, it has to do with my neighbors. Yeah. And, oh, by the way, I can have a role in that.

**Andy Farke:** [00:33:04] Absolutely. Absolutely. And I think also, with those sorts of personal connections, being able to show how all of this stuff is relevant no matter what career you go into. And coming back to what we were talking about at the very beginning, I don't particularly care if my students go into paleontology, like I love it, I'll be proud of them if they do that. But honestly, like that's not my goal. My goal is not to crank out another 20, or 30, or 50, or 100 paleontologists. In fact, that's kind of the worst-case scenario.

**Annalies Corbin:** [00:33:36] Exactly. Where would they work, right?

**Andy Farke:** [00:33:37] Yeah. And what I want, though, is my students, no matter what they do, to go out into the world and be people that whatever their field is, whether they're going into, they're owning their own business, or whether they're going into public service, or they're going into medicine, or engineering, or whatever it is, they can say like, they'll see something on the news, and say, oh, like I understand a little about how the scientific process happens or maybe there's a local issue coming up in an election that has something to do, a ballot issue that has some scientific links.

**Andy Farke:** [00:34:13] They can say, oh, like I can feel a little bit comfortable reading into this or no matter what it is, that they understand what science is, how the process works. And maybe not be so intimidated when they see someone with a PhD behind their name. It's like, oh, yeah, well, this is the process. That's how they got their PhD. And this is how they're an expert in this field. And this is the limitations of that expertise. And this is where really, they have some authority to speak.

**Andy Farke:** [00:34:40] So, I think it's really, just giving people, people in general, not just scientists, but people tools to look at the world, and also, beyond just like the practical stuff, just like looking at the world and getting excited about it because how cool is it that there's places where you go out and you can pick up a fossil of an animal that lived 50 million years ago, and to have that connection, and getting back to what Ray Alf was talking about, with our moment in time. Like one of the things that I really try and tell my students, and this goes back to Ray Alf's philosophy, is we look at the age of the universe, the age of the earth, we have billions of years' worth of Earth's history, if you're going to be really nihilistic about it, like, oh, wow, I'm really insignificant, and I know that.

**Annalies Corbin:** [00:35:26] Oh, yeah, absolutely.

**Andy Farke:** [00:35:27] Well, that's, I think, not the case at all. Like I think that broad expanse of time makes this moment that we're living in all that much more meaningful. It's like, wow, we've got this time on Earth, let's do something with it, take advantage of it. And don't be intimidated by this idea of big expanses of time because we're part of that. We're part of that story of Earth. And we can do a lot of good and reach a lot of people in that time on our planet with that moment of time.

**Annalies Corbin:** [00:36:00] Well, at the end of the day, whether you articulated that way or not, you are crafting stewards of the Earth, right?

**Andy Farke:** [00:36:07] Yeah.

**Annalies Corbin:** [00:36:07] Your students to go through this program and get to have this fabulous experience with you, back to your point, whether they become a paleontologist or not, they are good stewards of the Earth because of the experience that they shared with you. So, bravo for that, Andy. And thank you so much for giving us some of your time, sharing your story, and your experiences.

**Andy Farke:** [00:36:30] Thanks.

**Annalies Corbin:** [00:36:30] I have no doubt that there will be others who were just as excited about the work that you are doing, that I am. So, thank you for sharing with us today.

**Andy Farke:** [00:36:37] Absolutely. Thank you.

**Annalies Corbin:** [00:36:41] 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 @annaliescorbin and join me next time as we stand up, step back, and lean in to re-imagine education.