



## Alice Steinglass

**Alice Steinglass:** [00:00:00] You know, I can tell you, you're going to be good at it; I can tell you, you're going to like it, it's totally different to make your own app or make your own game, and then say, "Yes, I can do this."

**Annalies Corbin:** [00:00:16] 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:** [00:00:50] Welcome to Learning Unboxed. This is your host, Annalies Corbin from the PAST Foundation. And as always, I am super excited about today's guest and the conversation that we are going to have. On previous episodes, we've started talking about the importance of computer science and coding and the opportunities for students and how hard it is for schools and teachers to really ramp up to this.

**Annalies Corbin:** [00:01:12] The good news is there are some amazing organizations out in the world that are trying to be partners in this space. And today, we're going to be talking with Alice Steinglass, who is the president of code.org. Code.org is probably the biggest, most experienced in this space, deploying around the world, trying to help schools think very, very differently about computer science and the opportunities that are there. And so, we are thrilled to have Alice as our guest today. Welcome.

**Alice Steinglass:** [00:01:44] Thank you. Glad to be here.

**Annalies Corbin:** [00:01:46] So, Alice, for folks who may be that random person or random teacher out there on the street that doesn't know about code.org, we have listeners from all over the world, so give us the overview about this organization, where it come from and sort of what its mission and vision is. And then, we're going to get into the nuts and bolts about how you do the great things you guys do.

**Alice Steinglass:** [00:02:05] Yes. So, we are a nonprofit. We're dedicated to expanding access to computer science in schools, and increasing participation by women and underrepresented youth. Our vision is that every student, every school has the opportunity to learn computer science, just like you learn biology, chemistry, or in algebra school. There's just no reason why, in the world we live in today, our schools are not teaching computer science.

**Alice Steinglass:** [00:02:29] Unfortunately, it isn't just that our schools don't teach it, this has a disproportionate impact on students in high-need schools. It has a disproportionate impact on students of color. And we're dedicated to making it a part of the school day and helping schools do that, helping teachers,

helping administrators, helping schools bring computer science, just as any other subject, as part of the school day so that all kids have this opportunity.

**Annalies Corbin:** [00:02:56] Absolutely. And it seems crazy. We spend so much time at PAST working in that space of helping schools, quite frankly, retool for the 21st century, and the needs of where our kiddos are trying to get today, and certainly, what our employers and our workforce are asking us for. And it seems crazy to us that it's not—every school isn't doing it, and it's a required component for graduation, and viewed just as important as your math class or your language arts class in today's world. But we definitely still see that in lots of places.

**Annalies Corbin:** [00:03:29] And I think that part of it is that schools and teachers, even communities and certainly parents, I'm a parent myself, you know, if you didn't have early experience yourself with coding, it seems like it's completely foreign. So, how do you work—because a lot of this is application and process and actually getting in the weeds of implementation, but a big chunk of it is messaging, it's marketing. How do you tackle that? I ask the same question to other folks in manufacturing, right? You know, how do you change this paradigm?

**Alice Steinglass:** [00:03:59] Yeah. Well, I think you put your finger on it, it is really challenging, right? And I think when we started out, you know, people were looking at it and just the words, computer science, sound scary, right? There's this thing, I don't know it, I didn't learn it at school because you know what, almost no teachers learned it in school 20, 30 years ago, right? And so, we're just—even last year, most schools of education in America don't teach computer science. So, we have a world where the teachers are being asked to teach something that they didn't learn in school. And we can talk in a minute about the marketing, but I'd love to get into the implementation with you for a moment. You want to talk about a little bit about what that looks like because I think understanding what that looks like is part of it, right?

**Annalies Corbin:** [00:04:41] Absolutely. Jump right in. How do you do it?

**Alice Steinglass:** [00:04:42] Yeah. So, okay. You know, it is hard enough to stand in front of a room of 30 high school students to think they know more than you about a subject. It is extra activity when you're standing in front of a group with 30 high school students who are sitting there and saying, you know, hey, I know how to do this or that with computers, and you're supposed to teach them computer science. The good news is that teachers absolutely can do this. They're very successful at it.

**Alice Steinglass:** [00:05:09] We find that, you know, about half our teachers have no experience in computer science when they come to our professional learning programs of the summer. And they are incredibly successful at teaching computer science. And the thing that makes them most successful isn't how much technology they know, it isn't how much they play the computers, it's experience teaching, right? That teachers are, it turns out, fantastic learners, and they're lifelong learners, right? That's how they get into it. They love education. They love learning. And we found that teachers really rise to the occasion. They love learning something new.

**Alice Steinglass:** [00:05:47] And being able to have that experience of learning with their students, you know, teachers learn new techniques, they learn new pedagogical techniques, they learn new things all the time, right? And, you know, if you just take away the barrier of, "Hey, let's talk about this computer science", and you say, you know, "Are you learning new ways dealing with your students? Are you trying new things in your classroom?" The answer is yes. And so, the way we approach it is we approach it as being the lead learner in the classroom, being able to say to your student, "Hey, you know, I don't know computer science either, but we're going to learn it together."

**Annalies Corbin:** [00:06:22] Exactly.

**Alice Steinglass:** [00:06:22] And I've got 20 years experience learning. And I know how to learn it. We're going to learn—we're going to go on this adventure together. We're going to learn this together. And we do—you know, we learn ways of managing that classroom. We have tools and support so that they're guiding the classroom through this period of learning, and learning computer science along with their classroom. And it is successful.

**Alice Steinglass:** [00:06:46] You know, we've had over 100,000 teachers go through a professional learning program, even AP computer science in high school, our teachers are teaching it. They're teaching it—you know, they're learning along with the students, and the students are passing the AP computer science exam. So, you know, everything from kindergarten up through high school, we're helping teachers go on this journey where they are learning computer science with their students. And, you know, I don't know, the teachers are amazing, right? Happy then to-

**Annalies Corbin:** [00:07:18] They are amazing. And I think about we have advocated and used in professional development, not that we are leading the code.org piece, but we repeatedly suggested to schools, "Hey, you know, you send some teachers, send them to code.org, have them participate." So, any number of the schools that we've worked with, you know, in their transition from standardized curriculum to very applied or hands-on sort of approach, really, in an effort to engage students in the here and the now and the relevancy piece. Go and do that.

**Annalies Corbin:** [00:07:52] And, you know, it doesn't matter that you're the kindergarten teacher or like you said, the high school teacher with expectation that you're going to be teaching AP computer science. Does it make any difference? You too can code, and oh, by the way, your kids are showing up, and they're coding already. They may not articulate it that way, it may not even look like formalized coding, but the reality is that the kids who have grown up as these digital natives, they don't—you know, the kids in K-12 today don't know a world without that device.

**Annalies Corbin:** [00:08:27] And so, they have learned how to adapt and utilize and modify a lot of things in that sort of digital space and world. And it was just never codified. And for the teachers, I think it's freeing, back to your point. I love that you said that because that's exactly what I see. I watched them get down on the ground with their little kids, the elementary teachers in their iPads and their Spiros. And, you know, they are changing the world, and they're thrilled about it.

**Alice Steinglass:** [00:08:52] Oh, the elementary school teachers, yeah. You know, we started there, you know, to your question of, you know, where do you start, right? About half of our activities for elementary school are what we call unplugged. You don't even need a computer to get started, right? These are activities that teach sort of the concepts of computational thinking. So, how do you think about computers? How do you think about algorithms? How do you think about these concepts in the space of what makes sense in an elementary school classroom?

**Alice Steinglass:** [00:09:20] And so, that can be anything from—one of our activities is about singing songs, right? And you're singing a song with a classroom. And a song like—ultimately, McDonald's has a farm, right? It has a chorus that repeats throughout the song. And so, you can think about, well, what does it mean to have something repeat? What does it mean to have something a computer would do that it does again and again? Well, in computer science, I call that a function.

**Alice Steinglass:** [00:09:46] And so, we sort of have a function in our song. And we can circle that on the board and we can all sing it again. And not only is that a function, but there are pieces of it that change each time, right? Like you can do it with a pig. And if you do it with a pig, the pig goes oink, and if you do it with a chicken, the chicken goes bock, right? And so, we're learning a little bit of computer science, and we're learning it in a phase and in a way that's really engaging to a bunch of, you know, younger students and fits in really nicely with what a second-grade classroom might look like or a third-grade classroom might look like.

**Alice Steinglass:** [00:10:18] And then, when it comes to the computers, I think the other thing that's really important is making it easy for teachers to be able to pick up. So, we wanted to make it so that they don't need to install any apps. We want to make it so that, you know, you could just go to a website, and it's there, and it's running, and it will work on your tablet, it will work on your computer, and just make it really easy for a teacher to get started. Oftentimes, the way people start is with the hour of code, and that is a—you know, I guess this goes back to your initial question of, you know, how do you market it.

**Annalies Corbin:** [00:10:53] Right. Well, an hour of code, I would say, has been wickedly successful. I mean, when it's going on, when it's the season, right?

**Alice Steinglass:** [00:11:01] Yeah.

**Annalies Corbin:** [00:11:01] At least in Ohio where we are, you can walk into any school in the state, and someone is engaged in our code. You can't walk into a building almost and not hear them talking about it. So, it's effective.

**Alice Steinglass:** [00:11:15] That's fantastic. And, you know, so, the hour of code is both. It's fantastic, but it also—I don't want it to be an excuse for not teaching computer science, right? You know, nobody's going to learn computer-

**Annalies Corbin:** [00:11:25] Oh, absolutely. But it lets people tow in.

**Alice Steinglass:** [00:11:28] Yeah, exactly.

**Annalies Corbin:** [00:11:28] Yeah, it's low-hanging fruit, right?

**Alice Steinglass:** [00:11:30] Exactly.

**Annalies Corbin:** [00:11:31] Yeah.

**Alice Steinglass:** [00:11:31] And what we find is it's an entry point, right? It's a—you know, if you're not sure if you could teach computer science, if you're not sure if your students will like it, if you try in our code, it's a one-hour commitment. And it's just a way—you know, if you don't have an hour in your class, 45 is fine, do it 45 minutes, right?

**Annalies Corbin:** [00:11:49] Right.

**Alice Steinglass:** [00:11:50] It's an opportunity to try one thing and see if you like it. And what we find is that not only does it teach the students, hey, you know, computer science—they learn a little computer science, and they might learn, "Hey, this is something I could do." It may affect their self-efficacy. It may affect their interest in computer science, right? And as a teacher, it gives you an idea of, you know, what would it mean for me to teach this?

**Alice Steinglass:** [00:12:16] You know, is this something I can effectively do with my classroom? One of the things that I thought was most interesting, we did a sort of informal study with thousands of students that we ask them to fill up surveys before or after the hour of code. And we saw that their interest in computer science went up, their desire to take computer science went up, but the biggest impact was with high school girls. And I think part of that is they start out with this misconception that they don't belong in a computer science class.

**Alice Steinglass:** [00:12:45] And being able to try it, you know, I can tell you you're going to be good at it. I can tell you you're going to like it. It's totally different to make your own app or make your own game and then say, "Yes, I can do this." And yeah. So, that's something that we're—I think is a great way to get started and a great way to spread the word, at a school that's not doing it, with a teacher, with students just to get the word out.

**Annalies Corbin:** [00:13:10] I think also, too, for the kiddos, and I love that you circle back around with, you know, trying to get the girls in particular and high school girls, we see this as such a need in so many different aspects of STEM, right? There are all kinds of work that's been happening. There's been a long effort to change the trajectory of women in STEM, women in minorities, underrepresented folks in the STEM sort of ecosystem.

**Annalies Corbin:** [00:13:38] And one of the things that frequently I hear is, "Well, I can't do that", to your point, "because I don't belong there" or "I can't see somebody who looks like me", right? That's a very common sort of phenomenon. And the other piece of it is there's such high levels of access, the barriers to actually enter to try the thing oftentimes, by the time you get into high school, it's really complex between environmental and social and cultural, and all those other sort of barriers that you lump on to the sort of the feeling that folks have that I can't be there or that's not for me.

**Annalies Corbin:** [00:14:14] The other thing that I really like about the code.org process and certainly, the hour of code is that it gives folks that immediate short-term success that could then be translated to something else, which gets me to my next question. How do you actually effectively move folks from "I tried this thing" to now, "I'm going to take this course", but more importantly, "I'm going to take this course because I can see myself in a career down the road that this pertains to."

**Alice Steinglass:** [00:14:40] That is a hard question.

**Annalies Corbin:** [00:14:42] I know, it was a bit overloaded one.

**Alice Steinglass:** [00:14:44] Yeah. No, let's-.

**Annalies Corbin:** [00:14:45] If we could just talk through it.

**Alice Steinglass:** [00:14:45] Yeah, let's break it down.

**Annalies Corbin:** [00:14:47] I think the first barrier is the one I was talking about initially, which is most schools don't offer computer science at all. And so, even if you have students who are interested, who want to do this, who want this opportunity, if their school doesn't offer it, they're starting at such a disadvantage. And that's how we're tied, right? To your point, it is hard to start in college. It is hard to start if you don't go to college and some sort of post-secondary, you know, the barriers are going up, right?

**Annalies Corbin:** [00:15:18] And so, giving the students the opportunity to start younger, I think, is really important. And, you know, this isn't something we should just push off to high school and say, all of the high schools will deal with it or the middle schools will deal with it. I think it's important to engage the students, you know, starting in elementary school. And I think this is particularly important when you get to your question of girls because the research shows that girls interested in computer science tends to fall off, the same as other STEM subjects between about the ages of 11 and 14. And, you know, I've been in these second grade classrooms, the girls are excited to do computer science in second grade.

**Annalies Corbin:** [00:15:53] I was in the classroom and these little girls were making, like trying the apps that they wanted to design, like just drawing pictures of them. And this is also a good thing to do is to help your students connect the work to the goals that they have, right? Instead of telling them what their goals are, ask them what they want to do. You know, what else do they want to create, what game do they want to create? What do they want to do with their career? And, you know, it could be anything. Maybe they want to go into marketing, maybe they want to be a designer, maybe they want to go into medicine. Right now, I'm hoping a lot of people want to go into medicine.

**Annalies Corbin:** [00:16:30] Yeah, exactly.

**Alice Steinglass:** [00:16:30] And helping them see how computer science can be part of that. So, these students are designing these apps, and they're drawing pictures, and they're showing it, they're like, you know, "Ms. Alice, Ms. Alice, I've got this little heart robot and it's sort of, well, over the place." And it's, you know, and I don't know, I'm not a—kind of wish the robot wasn't a heart robot, but, you know, I'll take it, I'll take it as a heart robot, right? Like they're excited at that age.

**Annalies Corbin:** [00:16:56] Right.

**Alice Steinglass:** [00:16:56] And then, we see, you know, we could go to all these different studies, but we see that there is this falling off, and I want to give them the supports, so when they do see the computer science class in high school, they've got something that they already know that they feel like they can do, and they can see themselves doing it, and they could see themselves being successful at it. Beyond that, there's a lot of things schools can do to help support getting women into these classes, young women into these classes.

**Alice Steinglass:** [00:17:25] The number one thing that the research shows is telling a student you think they'd be good at it. Girls are less likely to be told that both by their parents and by their teachers. And it's something that schools can do. There's a—we did a case study with the Lincoln Public School District in Nebraska. They did an amazing job of getting a ton of young women to sign up for computer science classes. And they even had the soccer coaches going and writing letters to all of these women saying, "Hey, I think you'd be good at computer science. I think you'd be good at computer science." And-

**Annalies Corbin:** [00:18:00] That's awesome.

**Alice Steinglass:** [00:18:02] It works. It works. We have these suggestions and others at [code.org/girls](https://code.org/girls), we're just trying to share some ideas around what can you do as administrators and as teachers to help that happen. I think this is an area where, you know, teachers can have a huge impact, administrators can have a huge impact, counselors can have a huge impact. Everything from, you know, when do you schedule the course? Do you schedule it conflicting with the, you know, classes that are most popular for young women or do you schedule it at the time when they can make it?

**Annalies Corbin:** [00:18:34] Right.

**Alice Steinglass:** [00:18:35] Do you encourage the young women to take the class? Do you give them credit? Making it count for graduation credits and count as, you know, a real course does increase the number of women taking it. So, there are choices that we can make as administrators, as counselors, as teachers that can really help encourage the young women in the classes.

**Annalies Corbin:** [00:18:56] Yeah. And one of the things that we will often talk with our schools, especially when we're working with school districts and they are thinking very deliberately about how to sort of have a scaffolded alignment between elementary and high school from a programmatic standpoint, not just from, here are our state requirements, here are our obligations as students, but when they're really sort of thinking more about how do we scaffold students to be able to take advantage of academies or pathways that we plan or we have when the students get into high school.

**Annalies Corbin:** [00:19:28] And one of the things that we talk about with them frequently because computer science right now always comes up as it should, and we're thrilled to see that. And part of the conversation we have is let's weave coding in particular through all of the other courses that are happening along the way to a formalized computer science course or sets of courses in the schools that are very fortunate so that to your point, when it does finally arrive and there's a course to take that the students have not only had experience, small pieces of experience, but more importantly, from my perspective, is that they understand the context by where computer science and coding is immersed in literally everything they could do.

**Annalies Corbin:** [00:20:13] It's involved in every career, in every industry. You can no longer separate it out. It's not a thing that sets aside. So, what we have found is that the students who have been exposed to it over and over and over again do not hesitate to sign up for those courses because they can, in fact, see themselves and the potential for it. The other thing that we find that's quite remarkable where the students participate in those environments is, they will often lean on apps, coding, those opportunities as part of their native solutions when they're problem solving. And we do not see that in schools that don't utilize it.

**Alice Steinglass:** [00:20:51] Yeah, I think that's fantastic. I love that you guys are doing that kind of connection. I'm curious, how did you support the teachers in that? That's been a—you know, it can be a challenge, to have—you know, if it's, well, entirely different subject.

**Annalies Corbin:** [00:21:04] Yeah. It absolutely can.

**Alice Steinglass:** [00:21:08] Yeah.

**Annalies Corbin:** [00:21:08] Well, so two ways. So, the first one is to make sure that the teachers who are willing and sort of see the value of that type of integration, and we make sure that they get the professional development that they need in basic coding. And so, a fair number of them, you know, in Ohio, we are partners, say, with code.org, so with OSLN, that makes it really, really easy. So, in Ohio, it's easy for us to deploy teachers and really sort of push them into the programming that already exists in the state to at least get them at that sort of entry level ready to do that.

**Annalies Corbin:** [00:21:37] Some of our other states don't necessarily do that. They're not as organized in terms of the deployment that they have, but almost all of them do have local resources designed to sort of move coding and computer science into K-12 in some fashion. Some are better than others, right? Well, we tried to put those type of resources around them to at least give them the exposure. And then, we couple that. So, back to your original question, how do we support them in the English class or the social studies or in

science to be able to do that, is we really try to shift them from whatever their traditional curricular approach happens to be into a very applied problem-based environment.

**Annalies Corbin:** [00:22:15] You can't solve problems without recognizing that I have to bring a whole variety of topics, subjects, and skills to bear. And so, we support them in learning how to think about the ecosystem of what you need to solve a problem that you bring it in, whether it's your content or not. So, if I need math to solve this problem and I'm the English teacher, so what, I'll either go partner with the math teacher or along with my kids, I will learn the math necessary to help them progress in whenever that project is in that ecosystem.

**Alice Steinglass:** [00:22:47] Yeah.

**Annalies Corbin:** [00:22:48] It's a big lift.

**Alice Steinglass:** [00:22:49] Yeah. And I think that that is something that we've done in different ways at these different age groups, right? So, when you talk about elementary school, it's almost always integrated, right? I think one of the hardest parts about teaching elementary school is we ask teachers to be math teachers, ELA teachers, SEL teachers, computer science teachers all at once. And also, it's one of the best parts, right? That it is an age group where you see, you know, these things that are harder to do in middle of high school, these cross-curricular connections in elementary school.

**Alice Steinglass:** [00:23:22] You know, the social studies project is about history. It's about SELs, the students are learning to work together on these projects. And it's about writing. And it's about reading, right? It's sort of the teachers are bringing these subjects together. And so, with elementary school, a lot of our teachers are not—they're not specialists, they're not tech specialists. They're just elementary school teachers, just at the wrong word there, they are elementary school teachers, they're doing all of these things, right?

**Alice Steinglass:** [00:23:47] And we try to make it easy for them to pick up computer science as something that they can add into their subject, you know, once a week where they're learning some focused skills around computer science, how to make things happen on the computer. And then, if they learn those skills, then the teachers have the ability to do more with the students, right? So, maybe that next, you know, project that could connect, right? It could be, you know, something that is both a history project and a computer science project all at the same time.

**Alice Steinglass:** [00:24:17] In middle and high school, we really believe in the idea of project-based learning. And I think computer science lends itself really well to the idea of creating meaningful projects. There's a lot of space in a computer science classroom to not just answer a question, but to get to create something and to get to create something meaningful to you. And the more the students build up these skills to be able to create projects that are meaningful to them in computer science, I think the more they have the ability to make connections to other subjects and do things that cross connect, right?

**Alice Steinglass:** [00:24:51] So, if they learn how to build a web page, then they can build a web page about another subject, right? If they learn how to build an app, they could write, you know. We've got actually right now with schools closed, we put up a new web page called [code.org/athome](https://code.org/athome). One word, athome. And what we're doing up there is providing a bunch of materials that students can do at home. So, we've got code break, which is like a weekly class we're teaching. We have lessons students can do at home. But one of the things we've put up, especially for the middle school students, are projects that teachers can spend at home for their students to allow them to-

**Alice Steinglass:** [00:25:29] You know, while they're at home, if they want to or if their school's doing some sort of extended learning to be able to make something that connects computer science possibly to another subject, teaching science concepts with computer science or right to choose your own adventure book, which could be an app that can choose your own adventure or it could be a web page that can choose your own adventure. I think there's a lot of opportunity for these cross-curricular connections and the barrier, the first barriers to having the skills to be able to do that, right? You know, you need to be able to create an app to create the app that then connects you to a different object, though.

**Annalies Corbin:** [00:26:08] Right.

**Alice Steinglass:** [00:26:08] If we build those skills, I think a lot more of that will be good to come and we'll see a lot more of that.

**Annalies Corbin:** [00:26:13] And then, that's exactly what the kids want to do, right? They're hungry for those skills, circling back around to the fact that these kids live, have grown up in this very, you know, sort of digital-immersed, it's everywhere. It's in everything that they think about. It's in their classrooms, even classrooms that aren't really, really high tech. The reality of it is it's all around them. And so, the kids are really interested and intrigued and they want to play in that space.

**Annalies Corbin:** [00:26:38] So, the natural hook is there if we can actually capitalize, if you will, on the particular hook or the need that the students are interested in. One of the things that we see frequently is that if we can overcome the barrier at school and get the students and the teachers engaged, and that sometimes, we forget that there can be as big, if not a greater barrier at home. And not because of the lack of access or the technology, but back to this is not what we learned in school.

**Annalies Corbin:** [00:27:15] And so, you get an awful lot of why does this matter? Why aren't we just doing what we always do, right? If it was good enough for me, why is it good enough for my students? And that's a big battle that happens between, you know, progressing and changing school, so it doesn't look like what it used to and being at the forefront of ultimately what students need, and eventually what workforce is looking for. That's a tough conversation sometimes.

**Alice Steinglass:** [00:27:39] Yeah, actually, it is. I don't want to downplay it at all. I think there are two aspects of that. One is, you know, does the school have the support from the parents to offer computer science, right? So, if the administrators and teachers want to do it, you know, do they have parental support from that? We are definitely seeing that's the case that parents want their students to have economic opportunities. They recognize that there's all this technology that they're living with, that they don't necessarily understand and they want their kids to learn that.

**Alice Steinglass:** [00:28:13] So, we do see that schools generally get parental support to offer it, then that means 100%. And if they want more support, they can also send out more information. Oftentimes, there's something that is a great way for a school to tell the parent that they care, right? So, to be able to set up something to the parents to say, "Hey, we're leaders here, we're teaching computer science, is a win for the school." And they get a lot of support from the parents for having done it, for having brought that to their school.

**Alice Steinglass:** [00:28:42] We have a bunch of material at [code.org/staff](https://code.org/staff) showing, you know, why computer science is important, why it's important for the students. Lots of materials there that schools can use to help them get that support and that win with teachers, with students. Students generally loved computer science. So, that's another place where you get—you know, kids are excited that it's been offered. They like the

classes. So, it's another place where students really—you know, it's a reason students want to go to school is they get to go build that.

**Alice Steinglass:** [00:29:11] So, they get to go make games, right? At the same time, you're absolutely right that there are—this isn't across the board. And the same challenges that we're talking about before, for example, with women for—you know, it can be several situations, but sometimes, you know, you'll have parents who have less background or less exposure to this, who may be less encouraging to their students to take these courses. And that's something the administrators need to overcome, right?

**Alice Steinglass:** [00:29:38] If girls are less likely to be told by their parents they'd be good at computer science, then they're going to be less likely to sign up for these classes at school. And you're going to have the same differences that are perpetuated in an ongoing way because the parents may not recognize that they're even—that they are not encouraging their growth in the same way. And that's something we need to continually help them see so that they can help overcome as well. Yeah.

**Annalies Corbin:** [00:30:09] Yeah, absolutely. We definitely see the same thing. You know, there's something to be said for student encouragement. We always assume that every kid that walks in the door at the Innovation Lab is amazing and is going to be capable of solving big, giant, global, world problems. We don't know which kid that is, but we assume that every single one of them can be that. And we see the difference, right? Because they walk into the door, no matter what their background or their experience has been, their educational journey.

**Annalies Corbin:** [00:30:09] And they will often come, you know, especially the kids who come and spend all summer long with us. And we're fortunate. We sometimes have that happen, you know, the same back as a kid's week after week after week all summer long. And the difference between a kid in that first week, on that first day and a kid at the end of the summer is, you know, that first hesitant kid or I can't do this, I'm not smart enough, I'm not good enough, they'll give you this litany of things, right?

**Annalies Corbin:** [00:31:06] And by the end, they're directing the other kids about how fast they need to go and get on board and here's what we're going to do, and we've got this plan, and we've got this presentation, this company is coming in, and we're going to show them this amazing new app that we've built, right? And they own it. And they're teaching the other kids. And you realize that if you step out of the way, that that encouragement alone is there was that one piece, that secret sauce that was missing for that individual kid, and suddenly, they just take off because you put them in their element. So, that's awesome, yeah.

**Alice Steinglass:** [00:31:37] But I think sometimes also, there are just these barriers in the way that are these fake barriers, but they're real. I don't know how to put that.

**Annalies Corbin:** [00:31:44] Yeah, yeah.

**Alice Steinglass:** [00:31:45] But I have a student, and she didn't know how to use the mouse, right? And so, she gets into the class and all these other kids are, you know, they're like wheezing ahead and they're clicking on things. And, you know, computers are hard if you can't use the mouse, right? And, you know, she just didn't have the familiarity, like knowing where to click or what to do with the computer. And so, you know, after the first day, she just felt so far behind, right? But like she did a blog.

**Alice Steinglass:** [00:32:16] And that's one of the reasons for our—of course, that's why we do so many unplugged lessons for the middle and high school courses. We start out with a unit of unplugged so that, you know, whether you've got a lot of experience with computers or this other student doesn't, now, we're going to

start our middle school class by trying to build towers out of paper. And we're going to learn about the design process. And we're going to learn about iterations.

**Alice Steinglass:** [00:32:40] And, you know, paper crumbling and falling down and see how high we could build it again. And if that practice helps us build the classroom norms and helps us build the way we want the classroom to interact, then it helps build confidence with, I can do this, you know, for a unit before we get to the point where we're on computers, where some kids may have experience and some kids may not. So, this girl, she's struggling, she didn't think she was doing very well.

**Alice Steinglass:** [00:33:07] And luckily for me, she wasn't allowed to drop out. It was required. She had to take it. And, you know, we kept going. And she was fantastic. She got it. She figured it out. She went above and beyond. She was, you know, building things and building more things. And we were building these—we're doing a little bit of physical computing, and we're making little smart homes. And she made all the lights light up and like all sorts of cool stuff. It was amazing by the time she was done.

**Alice Steinglass:** [00:33:43] But I think that that's important, that we give our students a chance to get through some of these things, and especially, you know, some of these kids who don't feel like they belong or don't have computers at home or, you know, any of these sorts of barriers that make them think that I don't belong in computer science class. You know, if we can get them through those and give them an opportunity to build something that they care about, that they're successful at, then, you know, we could build their confidence and get them to a place, where, you know, they think they could do it. She now wants to be a computer scientist when she grows up. So, we'll see.

**Annalies Corbin:** [00:34:18] Oh, that was a big win. There you go. Right? Absolutely.

**Alice Steinglass:** [00:34:22] I don't know. She's only about sixth grade now, so I don't know.

**Annalies Corbin:** [00:34:24] That kid was empowered. I mean, the moral of our story is A, you recognize there was this disconnect and there was something that you could do about it. It was fixable, right? It was an experiential gap that you were able to back-fill. But more importantly, you know, that kid was empowered, you know, felt strong, felt good, felt worthy and oh, my gosh, look what I'm able to do. And those experiences translate across the board. So, how awesome that she wants to become a computer scientist now. But even if she didn't, you know, the empowerment piece alone would probably ensure that she could be successful in whatever she chose. And I think at the end of the day, that's the high bar that we've set. That's pretty awesome to be able to get to, yeah.

**Alice Steinglass:** [00:35:10] Yeah.

**Annalies Corbin:** [00:35:11] I would like to wrap our conversation up with two things. So, the first one is, what do you hear from the world of industry? And how much does what's happening in the world of industry impact the way the code.org iterates itself? So, talk a little bit about that exchange. The outcomes and the angles and getting more computer scientists in the world as professionals, you know, as it relates to then how and what you think about your programming should be at any given time.

**Alice Steinglass:** [00:35:48] Well, I think there are two aspects to that. I think the first is that, you know, I don't think of this as just like catch up, right? There are actually—it turns out that, you know, two-thirds of the computing jobs in America are outside of the tech industry. These jobs are not just for tech companies, they're everywhere. There are 500,000 current openings for computing jobs. They're the number one source of all the wages in the United States.

**Alice Steinglass:** [00:36:18] This is a space where no matter what students want to do, we believe that we're empowering students with skills that will serve them in their lives, whether or not they want to go into tech. And if they want to, that's great. And if they want to go do something else, you know, they're going to be—we're already carrying around smartphones connected to the internet in their pocket, we already have algorithms all around us, I want every student to be able to understand, you know, what is the cloud and how does the internet work and what are these apps, and feel empowered to be able to know how they're built if they—

**Alice Steinglass:** [00:36:51] You know, it's not that technology is doing something to me, it's that I have the ability to be a part of creating this technology in whatever role I go into. In terms of what specifics they need to know, like, you know, what is the current trend in the tech industry around this language or that language, it's all changing. It's all going to constantly change, right? When I was learning, you know, I learned basics and I learned Pascal, then I learned C, then I learned C++, then I learned JavaScript, you know, it doesn't really matter, right?

**Annalies Corbin:** [00:37:22] Right.

**Alice Steinglass:** [00:37:23] When we're talking about K-12 education, we're learning the underlying concepts, right? And those underlying concepts are useful, you know, as the frameworks or the languages change. In K-12, it's foundational. What we're focused on is foundational. I think of it very similar to how we think about biology, right? When you go to school, you're going to learn—in elementary school, you're going to learn, you have to digest this, you're going to learn your bones, right? And then, in middle school, you learn a little bit more about how your body works. In high school, you probably have the opportunity at your school to take a biology class where you can learn things like, you know, how does the sun—I don't know, the quad cycle or something, we forget it, but, you know, you learn, the sun comes out, and we're going to turn it into energy, right?

**Annalies Corbin:** [00:38:14] Right.

**Alice Steinglass:** [00:38:15] And, you know, most students will never go on and be an EMT or a nurse or a doctor, but, you know, when you are 40 years old and you twist something, you go to the doctor, and you say, he says you pulled a tendon. You say, "I don't know, I can't remember the difference between a tendon and a ligament", right? I know they're both connected, I can't remember which was which, but I have a vague sense of, oh, yeah, that's one of the things in my body that connects bones and muscles to each other. And I, as somebody who's going to live with this body for my whole life, have a basic understanding of how it works, right? And that's something that everybody should have the ability to know, no matter what they want to do.

**Annalies Corbin:** [00:38:56] Exactly. Yeah.

**Alice Steinglass:** [00:38:58] And if I do graduate high school and I say, you know, "I'm really interested in this, I want to do more", I know what that means. I know what it means to go to school, to be an EMT or a nurse or a doctor. In the same way, I think we can all learn foundational computer science, right? We can all learn how the internet works, we can learn about algorithms. We can learn what apps are. We could learn the basics of how they work in K-12 so that, you know, as we go through our lives and we find out that there's some sort of machine learning or AI algorithm that's impacting things like what TV shows I'm watching right now or what jobs I'm applying for or all of that. I know what that means, right?

**Alice Steinglass:** [00:39:37] And when I hear about that, wow, I know what that means. And if I decide to go and say, "Hey, I want to go work in this industry", I'm prepared to go into that. I'm prepared to get started. And

that's, I think, the unique foundational place. At K-12, education has always been about foundations. It's about foundations for life. It's about foundations for careers. And computer science is part of that foundational piece that every student should really have an opportunity to do. And in the same way that when we talk about doctors or nurses, you know, that industry is changing constantly, right?

**Alice Steinglass:** [00:40:14] So, if you want to be a professional, if you want to be a professional nurse, you have to constantly take new courses. You're learning about new drugs. You're staying up to date with the latest, you know, procedures, right? And if you decide you want to be a tech professional, then, yeah, you're going to have to constantly learn about what's changing in the industry. You're going to be the person who's getting, you know, figuring out what the latest, you know, JavaScript framework you should be using is.

**Alice Steinglass:** [00:40:41] You should be learning about what's going on. That's fine, right? You're set up to do that if you've got the foundational piece. And in the same way, when I graduate high school, I'm not ready to go straight into a career in the medical profession. There's more I need to do. When a student graduates in high school, having taken computer science, they're not ready to go straight into a career. They're prepared to get started to go into that career.

**Alice Steinglass:** [00:41:05] So, they finish high school. They could then go take, you know, whatever post-secondary thing they want to do to learn, okay, I'm going to learn this specific framework or that they get a four-year degree or I'm going to go do—you know, there's many different paths a student can take. And then, even when they finish that and they go get a career at that space, they're going to continually want to refresh that with all of the, "This technology field is changing fast." So, they're going to be constantly refreshing and staying up to date.

**Annalies Corbin:** [00:41:32] Yeah.

**Alice Steinglass:** [00:41:32] And again, I think the role of K-12 education is not to get students, you know, up to date with the latest, latest, latest thing that's changing, it's to give them the foundations, which they absolutely—we absolutely can in K-12.

**Annalies Corbin:** [00:41:47] Yeah.

**Alice Steinglass:** [00:41:48] Yeah.

**Annalies Corbin:** [00:41:48] Yeah. No, absolutely. I would agree with that. So, I always like to close the program with sort of the sort of sage piece of advice, I guess, right? So, imagine that you are a teacher sort of out on their own someplace in a school district that hasn't really said, "Hey, we're all in", but, "I'm here. I'm listening to you talk about how easy or how accessible this is", let's preface that a little bit, "and I want to give it a go", what's your top piece of advice to me about how I go about changing my own practice in my own classroom and trying to move my community in this direction? Let's end with that.

**Alice Steinglass:** [00:42:31] Okay. Well, I have the short answer and the slightly longer answer. The short answer, just to try one thing is you can try doing an hour of code with your class. I think it's a great bite-sized way to get started. It takes one class period and you can get a sense of what it's about, and hopefully build some momentum in your community around it. If it goes well, do it again and invite the parents, invite the administrators, you know, help build that interest in computer science in your area. My slightly longer answer is I think you should go to professional development, same with anything else, right?

**Annalies Corbin:** [00:43:07] Yeah.

**Alice Steinglass:** [00:43:07] If you want to learn a new skill, the best way to do it as a teacher is to go to professional learning, connect with other teachers who are also learning computer science with the community of other people that you can talk to and get support from, you can get some techniques, pedagogical techniques for how to do it, the skills, and get a chance to practice them. There's a lot of great professional learning out there. Code.org has ours out. That's [code.org/pl](https://code.org/pl) or professional learning.

**Alice Steinglass:** [00:43:37] And, you know, come join us and meet other teachers in your neighborhood. We work with organizations around the country on this. We also have international partners that we work with internationally, and they offer—internationally, we don't have [code.org/pl](https://code.org/pl), but many of our partners offer professional learning. And, you know, if not one of ours, there's lots of other great PL out there. I think, you know, teachers deserve high-quality professional learning that gives them support to learn how to do this.

**Annalies Corbin:** [00:44:10] Yeah, absolutely. And it is absolutely available to anybody that wants to give it a go. So, thank you very much, Alice, for joining us today and sharing about [code.org](https://code.org) and the work that you're doing and the efforts to change how we think about computer science in K-12. So, thank you for everything that you do.

**Alice Steinglass:** [00:44:29] Thank you so much for having me. And thanks for all the work that you are doing to support this. And thanks to all the teachers out there. They're the ones making the action happen in the classroom. So, we really appreciate all the teachers who have been a part of this movement.

**Annalies Corbin:** [00:44:43] Absolutely. Thank you so much. 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.