Lifelong Kindergarten, Lifelong Creativity

KATHRYN: Hello and welcome to the Big and Little Podcast.
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My name is Kathryn, the Museum's Podcast Producer and Digital Content Manager. Today on the show, Boston Children's Museum's President and CEO Carole Charnow interviews Dr. Mitchel Resnick in this next installment of our creativity series. Mitch Resnick is the LEGO Papert Professor of learning research at the MIT Media Lab and develops new technologies and activities to engage people, particularly children, in creative learning experiences.
His Lifelong Kindergarten Research Group developed the Scratch programming software, an online community used by millions of young people around the world, and most recently, a new mobile coding app called OctoStudio. The group has also collaborated with the LEGO company on the development of new educational ideas and products, including the LEGO Mindstorms Robotics Kits. Resnick also co-founded the Computer Clubhouse Project and is an award winning author for his book, Lifelong Kindergarten, Cultivating Creativity Through Projects, Passion, Peers and Play.
In today's episode, Carole talks with Mitch about his new project, OctoStudio, the value of kindergarten-style learning, the four P's of creative play, the relationship between technology and creative learning, and more. Let's dive in.
CAROLE CHARNOW: Hello, Mitch. Welcome to the Big and Little Podcast.
DR. MITCHEL RESNICK: It's great to be joining you.
CAROLE: As an MIT Media Lab LEGO professor, a developer of Scratch, author of Lifelong Kindergarten, and so, so many more creative efforts, we're just really excited to host you on this creativity series. So why don't we start with this broad question: with such a remarkable career, could you tell us something about your background, and who or what started you on this path to this career, and what path did you take that eventually landed you in the Media Lab?
MITCH: Well, it's been a winding path. And I think most interesting careers end up being non-linear. You don't just go from point A to point B. But I've been very fortunate to be able to work on things I really care about. I think if I look back at my childhood, I was always very curious about the way things worked in the world. I grew up near Philadelphia and I spent a lot of time at the Franklin Institute Science Museum and was always fascinated by the exhibits there.
And I always liked making things. My parents were tolerant enough. They let me dig up the backyard to build my own mini golf course. And when I got to college, I was very interested in math and science, and I majored in physics. But by the time I finished, I didn't think that's what I wanted to continue on. I'd worked in the college newspaper, so I decided to get a job as a science technology journalist because I always enjoyed helping people understand things.
So I worked for a number of years, you know, writing about science and technology. And that was great to help people understand the world. But after a while, I thought that some of the people I was writing about I'd enjoy doing some of those things, and I start to wonder what else I might do. And an important transition came when I met a professor at MIT, Seymour Papert, who was one of the great pioneers in

technology and learning, more than 50 years ago before anybody was interacting with computers or very few people were.

Seymour saw that computers would spread around the world and they could make a big difference in the lives of children. So very early on, back in the 1960s and '70s, he started exploring how could children use computers to express themselves creatively and to understand the world in new ways. And when I met Seymour, that really captured my imagination. So I came to MIT and I became a graduate student at MIT, working with him and others.

And actually, ever since then, that's what I've really focused on-- how can we help young people learn to think creatively and express themselves creatively through using new technologies. And I found it very rewarding because I get to deal with technology, but I also get to work with kids, which I love doing, and feel that I can make a difference in the world by helping young people make sense of the world and to be able to express themselves in the world.

CAROLE: Wow, what an exciting time when you met Professor Papert. And you know, I can feel your kind of childlike curiosity and energy. So let's just talk a bit about your group at MIT, the Lifelong Kindergarten. So could you tell us a little bit about how it got started and why did you decide on that name?

MITCH: Well, I think I've always been inspired by the way children learn in kindergarten. If you think of the traditional kindergarten, or it's similar if you go to the children's museum in Boston, you often see children playfully creating things and collaboration with one another, and they learn a lot in the process. When they build a tower out of blocks, they learn about structural stability. When they make a picture with finger paint, they learn how colors mix together.

But maybe most important, they learn about the creative process. They learn how to start with an idea, to create something based on that idea, to share with other people, to continue to adapt and modify and refine what they've created and to continue to develop their ideas. And I think that's the most important way of learning these days. And the ability to think creatively is so important in today's fast changing world.

Unfortunately, after kindergarten, children spend a lot of time sitting in classrooms, listening to lectures, filling out worksheets, and they don't continue to develop those creative capacities they started to develop in kindergarten. So I call my group Lifelong Kindergarten because we want to extend that approach to learning in kindergarten and bring it to learners of all ages. We don't think it should stop in kindergarten. We want everybody to get to learn in that kindergarten-style so they can continue to develop their creative abilities that are so important in the world today.

CAROLE: I love that. They get an idea, they create it, they share it, they refine it, they adapt it, and then they start all over again, I presume. I can't imagine. I haven't been to the Lifelong Kindergarten, and I wonder if for our listeners, you could give us a picture of what it's like in there. It must be quite a place.

MITCH: Well, even though we're located in a University Research Lab, we try to make our space a little bit like a big kindergarten. Of course, we have some more advanced technologies. It's not just wooden blocks and finger paint. We also have microcontrollers and 3D printers, but we also have a lot of craft materials. So we have all different types of materials, partly for when young people come and do, and we want to try out new ideas, but also just to spark our own imaginations.

The university students and the researchers in our Lifelong Kindergarten group are constantly experimenting with new technologies, and new activities, and new approaches to engage young people in creative learning experiences. So sometimes we'll bring young people in to try things out in our lab, but

often we go out into the world to try things out in different community centers or classrooms to get a better understanding of what's going to capture the imagination of young people and how we can help them be able to build on that, their imagination to develop as creative thinkers.

CAROLE: In your description of your work-- and by the way, for our listeners, there's a tremendous website, which we'll share the link to later, which describes this remarkable work. But you do talk about this new approach to school. And, we've just learned in the past month how poorly so many of our K through three kids are doing in terms of learning to read and so forth. So, as you are so dedicated to learning and education, what are your thoughts about the school as we know it now, and how can your approach sort of fill these gaps and really change the way kids are being taught?

MITCH: Well, I don't think there's any one simple, easy change to make. We have to rethink our whole approach to education and learning. Some of the challenges with today's schools is I think there are a lot of barriers. There's barriers between subject matters. You learn about language at one point in math and another time in science, where, a lot of times, the most interesting projects cut across the disciplines. We have barriers of time. And in many schools children will work for an hour on one thing, then move on to the next thing, then move on to the next thing.

And I think a lot of interesting projects to work on, you need larger chunks of time. Are there barriers between inside of school and outside of schools? Which schools would get more involved in the community and people from the community get more involved in schools? And maybe most important, it's important to connect with young people's interests, to make sure that they get a chance to work on things that are meaningful to them. Too often in today's schools, kids are just learning sort of basic mechanics of things as opposed to connecting to things that they find meaningful and interesting.

And I think we've seen over and over that young people, and adults, too, are going to work longer and harder and persist in the face of challenges if they're working on things that they find meaningful and they care about. And we've seen that over and over. I think there's a misconception that kids want things to be simple. I don't think that's right. Kids are willing to work really hard on things if they care about it. So we see that kids can have great learning experiences once they really get engaged in working on a project that they care about, and they'll dive in and make deep connections to the ideas involved.

So I think we always want to see how we might be able to change things so that young people have more opportunities to work on projects that are based on their interests. And we've tried this in school settings, but also outside of school. In fact, we started an outsider school. We started a community center right next to the Children's Museum 30 years ago. There was another museum called the Computer Museum right next door to the Children's Museum, and we started what was called the Computer Clubhouse.

It was a place for young people to come after school or on the weekends where they did get to work on projects based on their interests. And we saw many young people who weren't so successful at school dive in and really learn important ideas as they worked on projects that they were caring about. We've been very fortunate to get support to expand that idea. So there's now a clubhouse network with more than 100 sites, all in marginalized communities, giving opportunities for young people who haven't had the chance before to work on these types of technology-driven technology-oriented projects where they get to express themselves creatively.

So we see how this can work, and we want to bring that same type of approach throughout children's lives, whether it's in a community center, like a clubhouse, or at home or, in a school classroom.

CAROLE: It's just so exciting, and you've had so much success with this. Let's talk a little bit more about creativity. So, in some of your videos, you talk about the four P's of creative play, and you did talk a little bit about is engaging kids interests, but can you tell us a bit about this four P's and how this figures into your whole philosophy around getting kids to be creative?

MITCH: Yeah, as we've worked with young people over the years, we've seen that the most creative learning experiences come about when young people are working on projects based on their passions and collaboration with peers in a playful spirit. So we sometimes call those different elements the four P's of creative learning-- Projects, Passion, Peers, and Play. So whenever we're working on anything, whether it's developing a new technology or creating a new workshop for young people or educators, or opening up a new space for learning, like those computer clubhouses, we always keep those four P's in mind, and try to think, how can we engage young people, work on projects based on their passions and collaborate with peers in a playful spirit.

And we see that if you bring all of those things together, it opens up young people's imaginations and lets them make connection to important ideas and to develop their creative capacities. And we know that this is that it has to be done with the peers. The P of Peers. It has to be done as part of a community. The best learning doesn't happen when you're just sitting there by yourself. It's when you're learning with and from others.

We always try to see how can people learn connect with others as part of the learning experience. And when we say play, we aren't just meaning laughing and having fun. We see play not just as an activity but as a type of attitude. We have a playful attitude. It means you're willing to take risks, and try new things, and test the boundaries, and experiment. And we see the most creative learning happens when kids are in an environment where they're willing to try new things and experiment.

We always try to make sure that we create a space that where kids feel comfortable to try new things because it's sometimes scary to try something new and to experiment. So we try to create a space where young people can work together on projects, but it's a place where they feel safe and comfortable to try new things and experiment. And then the creative juices start flowing and great things happen.

CAROLE: Yeah, I love that description of play because that's also very much part of our philosophy here at the Children's Museum. So you've had some really tremendously successful projects. One of them is Scratch, and another new one is the OctoStudio. So for our listeners who don't know about Scratch, it's almost impossible to imagine there's people who still don't know. Can you tell us about Scratch and what that's doing and how you're engaging kids and then also talk about the new OctoStudio.

MITCH: In fact, Scratch grew out of our work at the computer clubhouses that I mentioned because back in the 1990s, as we were working with young people, giving them opportunities to work on projects at these clubhouses, they were doing all types of creative things. There were mixing photographs together and different types of collages and there were work in the music studio to make their own music. We saw that a lot of young people wanted to make interactive games and animations, but there wasn't the right software for them to do it.

The young people come into clubhouses weren't going to be learning traditional programming languages like C+ or Java. Those languages weren't designed for them. But software that was developed to help them make animations or games was too restrictive. It didn't let them do what they wanted to do. So we saw that there was an opportunity here to make a new type of software, a new programming language designed specifically for young people to enable them to create their own interactive stories and games.

And we knew they would learn a lot in the process, and that's what motivated us to create Scratch. So Scratch is a programming language, but it was unlike previous programming languages in several ways. In traditional programming languages, you have to learn all types of obscure punctuation and syntax. Where do you put the square bracket? Where do you put the semicolon?

In Scratch, it was more inspired by the way LEGO bricks fit together. It's graphical programming blocks, and you snap together the graphical blocks to make a program. So you don't have to worry about all the syntax errors of traditional programming. Also, we designed Scratch to really meet the interests of young people. So you could bring in your own images and bring in sound and music so you're able to mix together lots of different media to be able to make things that young people really cared about.

In fact, the name Scratch came from that idea of mixing different media together. The way that a hip hop disk jockey scratches to mix different clips of sound together, we wanted to the programming language Scratch to let kids mix different media together. We also made Scratch right from the beginning part of an online community so young people could share their scratch projects with one another.

So, if they made a game or animation, they could share it online, and other people could try it out and give them feedback, and suggestions, and encouragement. And also they could look at what other young people did to get inspiration for new projects. So we really tried to expand the ways that kids could create and share. You know, again, following those four P's, the kids with Scratch could work on new types of projects based on their passions and interests in collaboration with peers and in a playful spirit.

So we've been really excited. We launched scratch in 2007, and it's grown and grown. In fact, this past year, we passed a big milestone. There's now been more than 100 million children around the world they've created accounts on Scratch to be able to create projects. So, every day, there's 300,000 scratch projects that are created by kids around the world. So it's become very it's become the most popular programming platform for kids, too.

It's not just about learning to code, although they do learn technical skills with coding, but for us, even more important, they're developing their creative abilities to learn how to start with an idea, express their ideas, and to make new types of things and create with technology. So they get to see technology not just as a place to look up an answer or to watch a video the place where they can create something and share it with others. So it's been so exciting for us to just see all the creative things that young people around the world are creating with Scratch.

But, there was one limitation that we saw that when we designed Scratch back in the early 2000s. it was designed for laptops and desktop computers. It was before most people had smartphones. So Scratch wasn't designed to be able to create projects on a mobile phone or other mobile devices. And we saw that in recent years, there have been more and more young people have had access to mobile phones.

So, a few years ago, our Lifelong Kindergarten group started working on a new program called OctoStudio. It's designed specifically for smartphones and mobile devices. So my colleague Natalie Rusk, who also is involved in starting the first computer clubhouse, she's led this OctoStudio project. And just two months ago, in October, we officially launched the OctoStudio app that lets young people create their own animations and games on mobile phones and then share it with family and friends.

And since it's on a phone, you can create projects anytime, anywhere. We've seen kids go out into the world where you wouldn't take your desktop computer and take it to the park. But here you could take a phone grab pictures. We saw some kids in Chile using it to take pictures of their local community and then

use it to show about some of the issues in the local environment and how you could improve things ecologically in the environment.

Kids can also use the sensors on the phone. So we've seen kids make games where if you shake the phone, it plays like a musical instrument, or if you tilt the phone, you can make a driving game just by tilting the phone. So we've been excited to see how that's gotten out to the world. And again, we've been delighted by all the creative ways that kids are using this to be able to express themselves creatively on mobile devices.

CAROLE: I mean, this is like a movement, really, because once you are on the phone millions and millions of children do have phones all over the world. And I can almost feel the optimism you have about this network of creativity that's going on and how much positivity that can bring to our sad world.

MITCH: We do sometimes think of it as a movement. We really want to try to catalyze a creative learning movement around the world, to have people think differently about learning and education, and especially in parts of the world where they haven't had these opportunities in the past. One thing that's exciting for us about OctoStudio is that there are many places in the world where kids do not have access to computers or the internet, but they do have access to mobile phones. So this provides another way for them to start to express themselves creatively because too often when kids get access to phones, they just use it for watching videos or scrolling through social media.

We want them to see the phone as a creativity device to be able to create things and express themselves. So that's what we're trying to do, especially reaching young people who haven't had these opportunities before. So, in creating OctoStudio, we worked with educators around the world in Brazil, and South Africa, and India in many places where the mobile phone is the primary digital device that kids will have access to. So it's been exciting.

We want to make sure that it would be able to work well and connect with the interests and cultural experiences in the local communities there. So it's been exciting to see that, as we put it out, it's already been translated into more than 20 languages, so kids around the world can use it.

CAROLE: Yeah, I was going to ask you about the languages. So how does that work? Can you choose your language?

MITCH: Yes, so you can choose any of more than 20 languages. And it's been great we have just have a network of educators around the world who, as we've made, we've worked with them on the design of the software, and they continue to update the translations. They also make lots of suggestions about the different images and sounds that are included in the app because we want to make sure that people sort of can see themselves in the different images that they make use of.

They can create their own images with a paint editor or by taking a photo with the phone. But also it comes with some images. But the images come from different places around the world to make sure that it connects with the local communities around the world.

CAROLE: How do you screen and make sure that the content stays appropriate and so forth, or is it just really open source and it's monitoring its own self? I mean, do you think about that at all?

MITCH: For sure, especially with Scratch, there's an online community where young people can share their projects with others, so it's very important for us to be making sure that it stays a safe community for young people. So in the Scratch, as it continued to grow, spun out of our group at MIT, there's now a separate nonprofit organization called the Scratch Foundation that runs Scratch. And at the Scratch

Foundation, there's a whole team of moderators that are constantly reviewing what's happening in the online community to make sure that it stays as safe and friendly place for young people.
Some of this is done through technology, too, filters to make sure that what gets put up is safe and appropriate. But then also you need humans in the loop to be checking and making sure and to make sure that young people understand what's a constructive and productive way to give feedback to one another.
CAROLE: Wow, so parents can feel very confident in getting their kids engaged in Scratch that it will be a safe community for them.
MITCH: Yes.
CAROLE: You know, this whole idea of having your phone and the technology and also gaming and so forth, this is very different than what we think of as gaming. And that has also had a huge explosion and more and more children are getting involved in this sort of consumption of video games and entertainment. So I know you have a lot of thinking about a passive learner and an active learner, and this whole idea of engaging in creativity as opposed to just passive entertainment. So can you just talk a little bit about that and give parents a kind of context to understand the differences between doing something like Scratch or OctoStudio and then just playing games?
MITCH: Yeah, and I do think it goes back to that kindergarten approach. In the classic kindergarten, kids are constantly creating things, whether it's, again, creating towers with blocks or pictures with crayons or creating stories just by talking with one another and creating stories or drawing pictures. And we think that leads to some of the best learning experiences. So especially as we use new technologies, we're going to keep it in that same spirit.
So instead of kids just watching videos, we think they'll learn more if they create videos. Rather than just playing games, we'd like them to create their own games. Now, of course, they might also play games to get new ideas. It's not that there's anything that's wrong with sometimes playing a game or sometimes watching a video, but we think the best and most creative learning experiences will happen when kids are able to be in charge of the process where they're the creators because when they create something, it gives them a different sense of themselves in the world.
We want young people to grow up to see that they can be active participate in today's society, that they're not just they're listening to what's happening, but they can be active contributors to their local communities. So in everything they do, we want them to take an active stance where they can come up with new ideas, to develop their voice, to share their ideas with others because I think that's the way that people have a most fulfilling life.
I think this idea of being an active creator is going to help young people prepare for the workforce because in a lot of jobs you want people who are going to be able to be actively creating and contributing. But it's also important in their everyday life, whether in their local communities or just in their friendships. Just the things you do in your everyday life, when you create a birthday party for a friend, that's a creating experience.
I think a lot of the joys we have in life come from creating. So both for developing the type of special skills you need for today's workplace, but also just to lead a fulfilling life. I think this ability to see yourself as a creator is so important.

CAROLE: I just love that because so many people say I can't sing, I can't make art, but the truth of it is everyone can be creative. And this idea that you're instilling in people a confidence that they can create and make something and express themselves is really priceless, I think.
MITCH: I know that-- we have one video of a young child who is starting to use Scratch, and they say on the video, they say, you know when I show people that the animations I created, they say I wish I could do something like that. And then they say, you can. Just try it.
And I think people just don't give themselves enough credit or time to try things out. And I think we as adults, whether it's parents or educators, need to support young people to let them have a safe environment for trying things out and for experimenting because that's the way you learn. And it's OK if things don't go well at first. We don't do creative masterpieces right away. We need to experiment. Things go wrong, and that's OK. And we need to support them. Support young people when things go wrong to let them know they can try something else or to build on top of that or to try something different that you can build off of your mistakes to learn new things.
CAROLE: Wow. Do adults use Scratch and OctoStudio too?
MITCH: Yeah, well, certainly. We've seen some people like recently, with OctoStudio certainly in our research group, when somebody's birthday, we always make interactive birthday cards for people. So I do think that it's a way for everybody to be more creative. We design Scratch and OctoStudio more for young people, but I think it really is designed for all ages. And we see certainly, you know, educators use it, but also adults who want to have a way to express themselves creatively.
They're not designed as professional tools to use to develop a finished product in the workplace. But for something like making a birthday card for a friend or just recently, this morning opened up. Actually, we have colleagues in Italy, some of the best preschools in the world are in a town called Reggio Emilia.
CAROLE: Yes, Reggio Emilia. Yes.
MITCH: Just this morning, they sent me a holiday greetings card made in OctoStudio because we were just there last month introducing them to OctoStudio. So they sent me a holiday greeting card made in OctoStudio. So the educators there are using it to spread holiday cheer as well.
CAROLE: I'm thrilled to hear that. In fact, Reggio Emilia is also an inspiration for the Children's Museum. And we have one exhibit called Play Space, which is really based on all their principles and in their design aesthetic as well, which is so beautiful.
MITCH: And I've always loved in Reggio one of the frameworks they have. They talk about the 100 languages of children in, meaning that children can express themselves in so many different ways, and we need to support them in all those different forms of expression. And I think that's really inspired us that if you give children just one way to create, it'll work well for some kids, but not others. So we're always thinking, how can we make sure that all children have ways of following up on their own interests and their own style?
So there's 100 languages is that everyone has their own way of expressing themselves, and we need to support that, not try to funnel everybody to do things the same way. And I think that's one of the reasons for the success of some of our projects is that we're always thinking how can we support many paths, and many styles so different kids can do things their own way.
This builds on my mentor, Seymour Papert, used to talk about the importance of designing technologies and activities with a low floor and a high ceiling, meaning that it should be easy for people to get started, but you should be able to do more and more complex things over time. And I think that's really important.

But we've added another dimension. We talk about the importance of wide walls because we think there needs to be many different paths from getting from the low floor to the high ceiling.
Different kids have different interests and different experiences, so they'll all take their own path, and we need to support all the paths of their interest and all their paths to get them started and continue to grow in their own way.
CAROLE: Gosh, you must have so many interesting conversations in your lab. I would love to be a fly on a wall. And one of the conversations that you must be having, particularly there you are at MIT, is about artificial intelligence. So we probably would need a whole other podcast to talk about this, but can you talk a little bit about AI and its the impact on learning and education and whether there should be some concerns or whether people should feel this is another vehicle for all of these 100 languages and modes of expression.
MITCH: Well, see, I have concerns, but I also see opportunities. And as with many technologies, it depends on how we use it. I think with each new wave of technology, like 40 years ago, computers started entering people's lives. And then, 20 or 25 years ago, the internet started entering people's lives. And I think with each of those waves, it depends on how you make use of it.
They can be used in very positive, productive ways to enhance people's creativity and open up new possibilities. But they also can be used in very restrictive ways to limit people. And I think the same is true with this new technology wave of artificial intelligence or the new wave that's called generative AI. I think some of my-- I've have some concerns about the way that right now is being introduced in some educational settings. But too often, I feel that this new technology is being used as if it could just replace a teacher and that it can be the intelligent tutor that just tutors a child.
But I think that what, too often-- I think there are a couple of problems with that, that too often, it takes away the child's, you know, choice and ability to explore different things. It oftentimes funnels young people down in one direction, and it's easiest to create these systems for something where there's just a right or a wrong answer. And depending upon how you answer, it will then give you a next question.
And I think it's important to not get too-- we want to make sure that children have a chance to work on these more open-ended projects. And we also know that interaction with other people is very important. There are many things that the technology will not be able to do to cultivate a caring environment where young people feel, you know, comfortable and safe and exploring and trying new things and to have somebody that really understands their life experience. We want to make sure we don't lose any of that.
So I think we want to make sure that the new technology does not get used as just a replacement for human teacher because I think that can be really problematic. On the other hand, I do think there are opportunities if we make the right choice in how we design and use the new artificial intelligence technologies. It could support children in project-based, interest-oriented, community-based learning. So I think we need to see as we start using this new technology to make sure it fits in and aligns with our goals.
So for me, I would think what's most important today is that our young people grow up as creative, caring, collaborative, curious learners. So as we develop and use new technologies, whether it's artificial intelligence or something else, we always have to say, how can we design and use it to make sure that is towards that goal? It shouldn't just be used to help kids learn the same old things in a somewhat more efficient way.

And that's what's happening too much that maybe if AI is just used to help kids learn the same type of specific do a math drill somewhat more efficiently or more effectively. You might get some results to show that at least this incremental improvement, but it's not going to lead to our goal of helping young people develop as creative, curious, caring, collaborative learners.

CAROLE: Creative, curious, caring, and collaborative learners. Wow, that is a remarkable vision. So let's just talk about that for a minute. I mean, a lot of people think about school as a place where children are learning a lot of content and they have to learn math, they have to learn to read, they have to learn history and et cetera. But can you envision a school where this content can be learned through these various creative methods that you're talking about?

I mean, should schools just not worry so much about content and really worry more about these four C's? You're talking about creating kids that are creative, curious, caring, and collaborative?

MITCH: Well, I do think there is some important content or concepts that are important for young people to learn. But I think it should be done, and it will be most effective if they learn it through a process of working on a creative project because that's how they'll understand it best and make the deepest connections to the ideas. So I don't think it has to be an either/or.

Too often, schools focus only on helping kids learn the particular content, and the kids don't know why they're learning it. Like one example I sometimes give is I was at one of the clubhouses, and I saw one of the young people, I think there were maybe 12 years old, and they were working on a game, creating a game, and they wanted to keep scoring the game, and they didn't know how to do it. So I showed them how they can create a variable in this Scratch programming language and then use the variable to keep score.

And they saw how they could fit it into their program and they're very excited that their game can now keep score. And they turned around, and they said, thank you, thank you, thank you. And it made me think how often do students thank their algebra teachers for teaching them about variables. And that didn't happen because the kids don't know why the variables are important. Here, he understood the variable was useful to him. It was important to him.

So I still think, you know, learning about variables is important, but I'm convinced that young person understood variables in a deeper way. And could then apply it in other situations much better because he learned it in the context of working on a meaningful project. So I think that's our goal is to learn important ideas but in the context of a motivating and meaningful project.

CAROLE: Wow, that's so exciting. So I would love to go on and on. I do have a couple of other questions related to the listeners here. A parent or an educator who's listening has just going to gain so much understanding about what's important, how to get kids creative, and so forth. Aside from getting engaged in Scratch or OctoStudio, how can parents and educators encourage creativity in the general day-to-day of life? Have you thought about that, too?

MITCH: For sure. And I do want to emphasize although we're excited about some of the tools that we created, like Scratch and OctoStudio, they're just two of many different tools. So different kids will find different ways to express their creativity. So I think for parents and educators, I would go back to those four P's Projects, Passion, Peers, and play, and they can take many different forms.

So if you're a parent, make sure that there's opportunities for your child at home to have blocks, and crayons, and markers. These are all different ways that kids can start creating things and give them different opportunities to create things in different ways. I remember we saw this in the early days of the

first computer clubhouse. Our main focus was to show kids the possibilities of using computers to do creative things like making different animations or different photo collages.
But one day some of the mentors at the clubhouse brought in some hammers and saws for making something with wood, and the kids at the clubhouse had never used a saw before.
CAROLE: Wow.
MITCH: They spent hours sawing wood to make different types of things. And that was great. They got so captivated by it, and that was great, too. Although it was nice for them to be doing things on computer, they're different. Having kids create things and make things and all different ways is important. And different kids will find different materials things that capture their imagination.
So I think as a parent or an educator, I'd always think about how can you provide opportunities for young people to try out different ways of expressing themselves, making things, creating things to see which of them really captures their imagination and support them in being able to create things in that way. Give them opportunities to share things, give them feedback and suggestions, show them different ideas that might inspire them. If they get interested in a certain type of art that they're doing with their paint set, show them images that maybe will inspire them to go in different ways.
CAROLE: Yeah, we try at the Children's Museum to have so many different things that kids can try. So the parents can observe what is it that gets the kids really excited, which is the similar to what you're talking about. So you must be going so mad at the Media Lab with so many different things you're working on. But what would you say is the next big thing for you and your team?
MITCH: Right now in our Lifelong Kindergarten group at the Media Lab, we're thinking a lot about how we can connect people across the world into the type of creative learning movement that we talked about before. We see lots of great things happening around the world, but a lot of times, people are working on things they don't know about what others are doing. And they can find-- they feel somewhat lonely when they're working on these creative projects.
So an educator in South Africa may get great inspiration from something happening in India, or Brazil, or the United States, and they don't even know about it. So one thing we want to do is to see how we can connect together educators in different parts of the world who share the same goals and approach that we're supporting and how we can connect them with one another and to amplify good examples because people can learn a lot from just seeing what are interesting things that are happening.
So though, of course, we in our research group want to contribute to this with some of our own examples and technologies, we know there's lots of other great things happening as well. So we got a good start at this with some of our past projects. So like in OctoStudio, I mentioned, we worked with educators in many different countries. We want to make sure that we continue to connect those creative educators around the world so they can continue to learn from one another, collaborate with one another, and to be able to catalyze that type of creative learning movement.
CAROLE: Wow. Going from kids' creativity to healing the world and bringing people together. I mean, what an incredible vision. So obviously listeners are going to be so excited to learn about your work. Where can they learn about all of these different things that you're doing about Lifelong Kindergarten, about Scratch, OctoStudio, et cetera?
MITCH: To give a few suggestions. On the basic ideas underlying the work that we're doing, I did write a book that's called Lifelong Kindergarten that came out a few years ago. So if you look for the book

Lifelong Kindergarten, the subtitle is Cultivating Creativity Through Projects, Passion, Peers, and Play. So that book is one place to start.

You also can just look online. There's an online course and community that our research group has supported and coordinated. This called Learning Creative Learning. So it's about learning about creative learning. And on there, you'll see lots of videos and readings and examples, and it's all free. So that's a place where you can go and learn more about some ideas.

So if you just search for learning creative learning, you should find the site for that online course and community that has lots of resources, and you could connect with other people. There's also website for all the projects. So if you search for Scratch or OctoStudio or our Lifelong Kindergarten Research Group, you'll find websites that will have more information about those tools and about the work that our group is doing.

CAROLE: All right. And you have many Ted Talks and videos and lots of places where people can learn about you, too. So I wish we had more time on our podcast, and I hope that you'll come back and talk to us again as you grow into-- you learn about all of these new projects you're working on.

Thank you so much, Mitch. This has just been the greatest honor to talk to you. And we're so thrilled that you're one of our advisors here at the Children's Museum, and we just wish you so, so much luck with all the great work you're doing.

MITCH: Well, thanks so much. It was great to join you and to talk about these really important ideas. And again, I've taken so much of my inspiration from museums, as I mentioned, growing up at the Franklin Institute in Philadelphia and then working with seeing what you're doing at the Children's Museum, and a lot of our work has grown out of the things that we've done with museums. So thank you for all that you're doing and I look forward to seeing how your listeners can take these ideas and put them into practice because we learned so much when we just see how other people are taking the ideas and putting them into practice.

CAROLE: Fantastic. Thanks so much. All the best to you and your team.

MITCH: Thanks so much.

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