THE BROOKINGS INSTITUTION

WEBINAR

EDUCATION MEETS THE METAVERSE:
THE PROMISE AND THE WORRY

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P R O C E E D I N G S

MS. O'DONOGHUE: Hello, everyone. Good morning, good afternoon, and good evening to you all. Thank you so much for joining us today. On behalf of the Center for Universal Education and the Global Economy and Development Program at Brookings, I am very pleased to kick off the second event in a three-part series in partnership with the Yidan Prize Foundation, exploring emerging and timely topics in education likely to have deep implications for decades to come.

With the world focused on pandemic recovery and a myriad of sociopolitical challenges on the horizon, now is the time to discuss, analyze, and when appropriate, seize upon emerging opportunities in education. Our event series brings together Yidan Prize laureates, members of the Yidan Council of Luminaries, education experts from the Center for Universal Education, and other leading experts in global education.

Our first event, which took place last week, explored how to ensure refugee children can access education, drawing on the current events in Ukraine, and sought to find more sustainable system-level solutions for people on the move, not just in Ukraine, but for the hundreds of thousands of displaced student populations around the world. Our third event slated to take place in early September will look at how to move beyond the false dichotomy between foundational learning and the development of a breath of social, emotional, and cognitive skills in the return to schooling post-COVID-19. So, be on the lookout for more information to come on that event soon.

And I'm so glad that you've joined us today for our second event, *Education Meets the Metaverse*, which promises a robust and lively discussion at the cutting edge of the intersection of technology, innovation, and education, focused on how to bring our best understanding of how young people learn into the metaverse while it is still under development. Under the scholarship of Kathy Hirsh-Pasek and others, Brookings has increasingly taken the lead in this space and hopes to develop recommendations for effective and inclusive policy and practice in this area.

Before we get started, I would like to extend our appreciation to the Yidan Prize Foundation for its support of the Center for Universal Education making it possible for us to cohost these events. I would also like to reiterate Brookings' commitment to quality, independence, and impact in all of

its work.

And without further delay, I am pleased to introduce today's moderator, Laurie Segall. Laurie is a journalist, entrepreneur, and author. As CNN's senior technology correspondent, she interviewed the world's most influential leaders, winning numerous awards for her investigative reporting. She has also contributed to *60 Minutes*, covering extremism and conspiracies. After a decade covering tech, Laurie launched Dot Dot, a media venture exploring technology through the human lens. Most recently, she published *Special Characters*, a book exploring the last decade of innovation. Laurie, please join me on screen and take it away.

MS. SEGALL: Thanks so much. I'm so happy to be here with you guys today and specifically about this topic given my background. I got my start covering technology in 2009, which is now we're dubbing Web 2.0. I created our startup beat at CNN and I was excited when the founders of Twitter told me that Twitter was going to transform democracy. I mean, I think they were right. And I covered technology through the complicated years sitting in front of Mark Zuckerberg during Cambridge Analytica, the scandal, and asking him what went wrong?

And I think we see what happened when the Wild West is built without diverse thinkers, without the proper protections, and without a humanity first approach. And so, I'm very passionate about it. And I think we're on the cusp of a new era of the internet. It's very exciting. It's one that's more immersive. We hear talk about the metaverse, and Web 3.0, and we're going to get into all of that.

And I think we really have some great thinkers here today who are thinking about the future of the internet, the future of our children. And so, I want to introduce them. Before I introduce them, just a little housekeeping. Viewers can submit questions by emailing events@brookings.edu or on Twitter using the #BrookingsYidanPrize. And I've already incorporated -- a lot of you guys asked a lot of questions before, which means we have a super engaged audience, which I'm very excited about. So, I've already incorporated a lot of your questions into this conversation. So, please ask even more.

So, I would love to invite our panelists to join me on screen. And I'm going to introduce each of you guys. So, if you guys want to turn on your cameras. Hello, everyone. Good to see everyone. Great. And I want to start with Anant Argarwal. He is the chief open education officer at 2U

and the founder of edX. He's a professor of electrical engineering and computer science at MIT and a 2018 Yidan Prize for Education Development Laureate. So, he's been a pioneer in education for a very long time. And I always say that folks do a better job introducing themselves too. So, I'm going to give you a less than a minute opportunity to explain a little bit more about what you do to folks, Anant.

MR. ARGARWAL: Thank you. Thank you, Laurie. So excited to be here. You know, edX is a platform company. I've been a professor at MIT for 34 years and about 10 years ago, we founded edX in partnership with Harvard and MIT. The project was led by both edtech engineers who also turned out to be educators and professors for decades. And so, we launched edX as a platform company where we connected learners from all over the world to great educators from great universities and companies. And today, edX has grown to about 45 million learners who are learning from every single country in the world.

MS. SEGALL: Great. And next up is Kevin Clark. Kevin, you are a children's media producer and consultant. You work at places like Netflix. You have been passionate about diversity and inclusion. I read quite a bit of your writing on it. It's super fascinating. I would suggest everybody go and read what he's written on some of these topics. Tell us a little bit more about your background.

MR. CLARK: Thanks, Laurie and happy to be here. Well, my background started as a computer scientist. My background's in computer science. I was a game developer. And so, all of these issues are really close to me. I was a professor for over 20 years at George Mason University, focused on educational technology. And so, my work in the technology and digital media space tends to focus on broadening participation and making sure that we develop inclusive and representative solutions to technology and media use. So, again, happy to be here.

MS. SEGALL: Great. Rebecca Kantar, you are head of education at Roblox, which is a very powerful seat right now because so many children are growing up in these games. I mean, I think if there are any parents who are watching, I think they would probably confirm that with me. Tell us a little bit about your background and what you're up to.

MS. KANTAR: Sure. Thank you, Laurie. And thanks so much to everyone for having us here today. I lead education at Roblox, as Laurie shared, which puts us in a tremendous position to help

50 million-plus kids a day learn. And learn in ways that are playful, and engaging, and meaningful, and deep. My background is in building game-based and simulation-based assessments. My assessment company was acquired by Roblox in 2020. And I really brought the focus of those assessments on deeper learning and understanding students' ability to work through problems, create, understand systems to the forefront of the work we're doing with partners who are building educational content on Roblox. Thanks so much.

MS. SEGALL: Wonderful. And we have Kathy Hirsh-Pasek and Kathy is a senior fellow at the Center for Universal Education at Brookings and a Stanley and Debra Lefkowitz faculty fellow in the Department of Psychology in Temple University. I'm very familiar with your work as someone who's covered technology and interested in psychology and children's education. You've written quite a bit. You've done so much research about this. You've really been at the forefront of it. So, when you told me you were doing work on the metaverse, I was like I have not heard anyone in education really focusing on this yet. So, I'm so excited to hear what you have to say. So, tell us a little bit about your background.

MS. HIRSH-PASEK: Well, thanks, Laurie. I think we just wanted to get ahead of the curve. I think we were so behind the curve when it came to apps that it was time for scientists to be part of the conversation. So, I'm what they sometimes call a translational scientist. I work in the area of the science of learning. And my real interest is in trying to bring really decades and decades of knowledge from the science of how young children learn, how the brains actually learn, and see if we can begin to apply this in various areas.

So, I've dabbled in areas like city planning. What do we do to remake the way schools run so that they actually teach in the way that humans learn? And importantly, I've been into play and playful learning, which got me into edtech. And I think we can do so much with edtech if it's done right. So, I am so excited to be here.

MS. SEGALL: And then last, but certainly not least, Simran Mulchandani, you're the founder of Project Rangeet. Tell us a little bit about it.

MR. MULCHANDANI: Thank you so much. Thanks so much for having me here today. I am, as you said, one of the founders of Rangeet, which is a mobile app for schools, communities, and

families. Collectively, we refer to them as facilitators to support the overall wellbeing and development of children aged 7 to 16. So, what this platform contains is a social/emotional and ecological knowledge or SEE curriculum, which is play-based, inspired by Kathy. As well as an M&E suite to monitor and measure its impact on children.

At Rangeet, we're committed to building strong evidence-based systems based on the science of learning and technology tailored to individual needs to develop tomorrow's global stewards. I am so excited to be here, learn from everyone on this esteemed panel, and to share my journey, and hope it adds value to everyone. So, thank you so much.

MS. SEGALL: Great. So, I figure because this is all about the promise and peril of the metaverse and education, I figure we should start out with what is the metaverse. I know there's so many different definitions of the metaverse and some are skeptical, and we can get into all of that.

But how would you guys define the metaverse? I mean, Rebecca, I know, you know, I think that Roblox is certainly kind of -- can be that kind of environment. I mean, how would you put -- how would you define it, simply?

MS. KANTAR: Sure. So, at Roblox, we think about the metaverse as a place to be when you can't be together in real life. And I think that word together is really important because it is a platform and a possibility for all of us to enjoy human co-experience. The same kinds of co-experience we experience in our daily lives, but in a virtual space when we can't be together in real life.

I'd say also for us, there is a vision for the metaverse of being civil, of being a place for optimism, for dignity, for respect. And we've tried from our very beginnings to make sure that we don't make the same mistakes that have happened in other corners of the internet to think about these requirements as foundational for all providers who are working on bringing the metaverse to fruition.

MS. SEGALL: Okay. Simran, do you want to add anything to the definition?

MR. MULCHANDANI: Sure. Mine is quite simple. I sort of think of it as, you know, having the freedom of building a house in the neighborhood in the sense. Or participating yourself in worlds brought alive by films like *Avatar*, *Matrix*, or *Ready Player One*. But in my context, the education, I see this as, you know, a world that's accessible to students and teachers across the globe and allowing

shared interactions without boundaries, and as Rebecca said, in a respectful, optimistic way.

MS. SEGALL: So, I want to talk about -- and by the way, that's so -- it sounds great. It's almost different because there's the Neal Stephenson like, you know, *Snow Crash*, where you put on the virtual headset, and we all live in these alternative worlds. So, there's so many different definitions and I think there's the optimistic definition, right? It's very back in Web 2.0 when we had founders being like we're going to change the world for the better and then.

So, we are at this really interesting moment, I think, where there's the optimism of everything good that can happen. And there's also the peril where we're talking about how do we ensure that we build this for the better?

I want to talk about the paper, Kathy, that you wrote, Kevin, you wrote. You guys co-wrote this with quite a few experts in this space. It's called *A Whole New World: Education Meets the Metaverse*. Tell us a little bit about the paper and those key themes. Why did you write it? And what was the response?

MS. HIRSH-PASEK: Well, first of all I should say I was so lucky to be able to work with the Dream Team. We really wanted to help share the latest science on how children learn with people in the edtech industry. And this was an attempt to pull together really what are decades and decades of research, and to imagine what would be an optimal world if we use the metaverse for good.

So, in our view, I'll just give one example to get us started. If you might be teaching about ancient Greece, wouldn't be incredible if you could actually go backwards in time with your students? And your students could not only understand the number line as you moved through time, but then see what Greece really looked like in 500 BC. And after you explored it and saw the hustle and the bustle, come back to the present and then ask the question, how did we ever know that it looked like that? What would it take?

And importantly, in the view that Kevin and I and our colleagues wrote, it doesn't knock out the teacher. It doesn't take away the hybrid social interaction. It embeds it in the experience to just make it richer.

MS. SEGALL: You talk about --

MR. CLARK: And I'd like to add, I mean, I think one of the key aspects of this report is that there was a communal -- I felt like there was a communal approach taken to creating it. Oftentimes, you know, we have scientists who operate in isolation, and they are looking forward to what the possibilities are. And in this instance, I felt like a community of scholars, and practitioners, and researchers were brought together to begin to talk about these issues and to highlight them before they took a huge role into the education space.

And so, we started talking about issues of representation, and inclusion, and safety at the beginning, not at the end once it's built. And so, I encourage all of us to continue to be involved. And I applaud Kathy for making that community exist and inviting all of us in to lend our voices to such an important issue.

MS. SEGALL: And, Kathy, before we kind of broaden it out, there is this idea in the paper of the Six Cs. Can you walk us through that framework for education of the Six Cs?

MS. HIRSH-PASEK: I absolutely can. You know for years, -- well, at least since 1975, when in the United States a seminal paper came out called *A Nation at Risk*, which really wasn't just about the United States. It's a worldwide problem. The world was changing very quickly, and education systems were not. In fact, *Times* once quipped that if Rip Van Winkle woke up today, that actually there'd only be one institution that looked the same as it did 100 years ago, and that would be education.

And part of the problem is that we have maintained a laser focus on shoving in content. And what the science tells us is that shoving in is not the way children learn. Where they are not employing vessels to have things dumped in. What they are, are active beings with an active brain and an active mind and a curious mind. We're also learning through the internet revolution that started, you know, long ago and I think was even more so in 2011 after apps came out, that just learning content wasn't going to be enough. Notice the just. I'm not throwing away math and reading. I'm just saying that in the way we look at it in the science, they are interconnected skills. And the suite of skills, what we call skills for a changing world at Brookings, are critical.

We call them the Six Cs in my vision, which is collaboration. There's not a business out there that doesn't talk about what team you're on, relationship building. That builds communication.

Writing, listening -- that's a lost skill -- and speaking. That is what builds content and learning to learn skills, critical thinking skills, creative innovation.

And finally, and a hard one, the confidence to give it a whirl. To really try something and to fail because we've been taught not to fail. And the greats in the world are all willing to persevere through failure. And that's what helps you learn grit. So, an interconnected suite of six skills that the science supports and are malleable through time.

MS. SEGALL: Great. I want to ask you guys, I mean, when you think about the education technology of today and the future, how do you think this idea of the metaverse will change what we do in schools, in general? I mean, it's such a -- it feels a little bit far out, but it might not be. And so, I think that's why we almost have to, I mean, and I'm sure -- Rebecca, I see you nodding your head because I think Roblox is such a good example of like the numbers are astronomical of people signing on. So, maybe we could start with you. How do you think this idea of "the metaverse" will change what we do in schools and change education?

MS. KANTAR: Yeah. First, I just want to second what Kathy said and what her academic work has demonstrated and signaled for all of us. Which I think, first and foremost, we want to think about not just openness and access when we think about metaverse in classrooms. It's not just about, oh, you can hop in from anywhere in the world. Yes, that's nice. That's true. That's been a trend in the democratization of access of educational content. Great, let's keep doing it.

But Kathy's work brings up a second point that is really near and dear to Roblox' agenda, which is depth. You need to have experiences that center the teacher in the classroom as their curricular and instructional programs do now but allow them to go deeper instead of inch-deep, mile wide. And that brings me to kind of how do we do that? What's the permission structure that needs to change?

And for me, there it draws on my background and assessment as well. I think it's really about currency. It's about completion and currency. Can you have folks make it through learning experiences? That are deep that explore complex scientific phenomena. Or that travel and do something in a historical era that's otherwise inaccessible to all of us today. But can you then translate that into a demonstration of generalizable learning?

Because if you can't, while great that we're building all of these things and hoping they will come, but we lack the ability give learners an ability to translate that into some currency. APs are a great example of currency that everyone appreciates. You take an AP course. You take an AP test. It turns into credit. We actually have very few similar examples of solid completion turned into currency in our educational world right now.

And certainly, what edtech has borne, I am hopeful that metaverse experiences smartly contextualize in the curriculum or in the instructional program, again, to go deep, not just to have a ton of offerings that anyone can jump into at any time. Can help students achieve more of that completion, more of that currency, and really transport those skills that they learn about in one experience or another in the metaverse into real life novel situations where they have to bring to bear the same knowledge, the same applied skills.

So, that's my hope is that we go deep instead of just broad. And I think a lot of educational organizations will continue to use the metaverse and other virtual content integrated into curriculum to facilitate that deeper learning.

MS. SEGALL: Can you give an example when you say like go deep, and --

MS. KANTAR: Yeah, yeah.

MS. SEGALL: -- you talk about how that would --

MS. KANTAR: Absolutely happy to. So, most states propose --

MS. SEGALL: Yes, what does that look like?

MS. KANTAR: -- yeah, most states or national curricular standards right now actually call for higher rungs of Bloom's taxonomy, right? Whether you like it or not or think it's the right philosophy or not anymore. There are standards that are outlined for English language arts, for math, for science, for all the traditional subjects, as well as things like civics and more frontier areas that more and more states and regions and districts are adopting worldwide.

And yet when you look at what our tests measure and what most of our curriculum centers around, it's kind of the low level like did you get the bits, as opposed to can you bring all this together? You know, integrate it. And can you translate it? Transfer it to a novel situation and

demonstrate your true mastery of the material.

So, an example, FIRST Robotics, a very well-known robotics organization, building an experience on Roblox that allows students to do very complex virtual robotics. Great example of openness and access, absolutely. Those kits are really expensive. But also, what a great way to honor, say, the next generation's science standards that ask students to think and act like scientists in teams to build things, to iterate, to model, to respond to dynamic systems and environments.

So, those kinds of experiences that can bring to life things that are challenging to otherwise interact with in, you know, a textbook or a video, and really put students together on problem solving, on constructing, on iterating. It's those higher-level skills that we want to bring to the foray.

MS. SEGALL: Great. Anant, I want to ask you. You know, it's been 11 years since the introduction of the iPad and the rise of educational apps. It feels like we have a bit of a roadmap now of what worked, what didn't. How do we follow that roadmap when building out this idea of metaverse education experiences? And what's your overall take on the metaverse and is this coming? Is this here? How do we build this out safely?

Oh, we've got to unmute you. You got to unmute, I think.

MR. ARGARWAL: You know, I fall for this mistake every single time and I've been doing this for 2-1/2 years now. So, you just can't teach this old dog new tricks. But, you know, be that as it may, I think the way to look at it, you know, the metaverse, the virtual reality, you know, VR, XR, this is a class of really cool new technology that have the potential to change humanity, much like many technologies came together and did 10 years ago.

So, we just have to look back 10 years to see how some of those technologies changed our lives in the past 10 years. Use the good examples from that. So, let me give you an example. I was a professor at MIT in the late, you know, 10 years ago. My colleagues and I were teaching in classrooms, one-hour lectures, you know. How many professors do you think have read the famous paper by Craik and Lockhart, amazing learning scientists from 1972 about active learning. You know, Kathy talked about active learning and so on. You know, I would say less than 1 percent of professors have read that paper.

So, we were teaching the usual one-hour lectures. And then what happened in the late,

you know, 2007, 2008, is many incredible technologies came together. Like Cloud computing, mobile computing, video distribution at scale, gamification, social networking. So, these were incredible, four or five incredible technologies that came together and created the perfect storm of something revolutionary that would happen.

And I'm going to look back to that time. So, when we were at MIT, we were educators, and we were also computer science engineers. So, we said how do we apply this for good? These technologies for not just chattering on social, you know, but how do we leverage these for good? And we launched ed/X as a global platform for learning. So, we as educators, engineered a platform. We built prototypes where to me it was very critical that it not just be about access and content, but about depth and quality.

So, our motto at ed/X was quality learning for everyone everywhere. So, the quality, the depth was very critical. It's not just about putting videos online and letting people watch it. That's access. But the question is how do we create quality outcomes? How do we create really good learning? So, what we as educators, who were also engineers, when we founded ed/X, we leveraged these technologies I talked about. They were the perfect storm at the time. And we launched ed/X, which was a MOOC platform.

And from the very first day, our very first course, was built not just as one-hour videos that people have to watch, but we brought them active learning. And frankly, at that time, I read more learning science papers than I'd done in my 25 years at MIT before that. Before that I had read zero learning science papers, zero.

And so, when we wanted to apply these technologies, we first looked at active learning. So, on ed/X, each class is an active learning class where we interweave short videos with interactive assessments and labs and gamified experiences. Where learners are learning content and then immediately apply it so that they bring things from, you know, various parts of the brain and move things around so that learning really sticks.

So, I think we should take lessons from examples from the past where educators and engineers and learning scientists all collaborated. In our case, the engineers and educators were the

same people. I was both an engineer and also an educator and so were my colleagues. So, in the very first course, we built out using gamification techniques. We built out circuits labs where learners could play the music and do all these amazing things.

So, taking that lesson to the metaverse. The metaverse is the new -- is the cool new thing. So, the lesson we take is let's make sure that we have educators actively involved. And I promise you here as one educator you're looking at who's also an engineer who is actively looking at how we can leverage the metaverse to create completely new ways of learning.

Now, many of us might say, look, we've got to get the teacher into the mix. Why should we have any preconceived notion about the metaverse? When we've taken surveys of learners, we asked them who do you like to learn from? You know what the number one request is? It's not from teachers. It's from each other. In the metaverse, can you imagine people learning from each other? Students from all over the world interacting. You know, Kathy, you talked about Greece. Imagine, you know, I go through the metaverse, and I land by the Acropolis. And imagine I run into a kid from, you know, New Zealand and a kid from Alaska kind of get together and began chatting and talk about their cultures.

You know, these interactions and peer learning are going to be key. So, to me, let's not have any preconceived notions. Let's view it as an incredible playground. Let's look at learning science which has shown that peer learning can be incredibly powerful. And so, to me, bringing in peer learning into the metaverse where people learn from each other is going to be a big thing.

And so, I think we should just look at successes from the past and apply them as we build edtech and metaverse learning experiences for the future.

MS. SEGALL: When we talk about looking at success of the past, I think we also have to look at what we learned from past and some of the negative ways, right? And we look at harassment and all the things that we've learned about technology and its impact on us and where things can go wrong. So, as we're entering a new venue, I know there are a lot of questions from the audience on this.

I had a lot of questions because we're now with a panel of experts on it, but of ethics in this new world. Of our children growing up in these more immersive environments. Let's paint the picture

of a classroom where there's AR or VR incorporated into it to whatever degree in whatever these metaverse-like environments are.

You know, we just had a question come in that said, how will the metaverse affect the sensory and social experiences of children? You know, I'm curious what do you guys think? And should there be certain ages that, you know, people are -- our children are allowed to enter these environments? Who's thinking about that? Whoever wants to take it.

MS. HIRSH-PASEK: I'll jump in. No, I will jump in because I've thought a lot about that. You know, we just saw 2-1/2 years of an absolute disaster with young children in particular. I think it's fair to say that remote learning for young kids is an oxymoron. It simply doesn't work, didn't work. We created social issues. And Simran, I want you to jump in here as well.

The one thing that I think we clearly know in the science is that humans need humans. And that avatar meeting avatar, especially for little guys, absolutely will not be the same thing. They need a responsive, and an interactive, and a social, and a being there, including touch, body movement, eye gaze, everything that goes with that. And what we are learning more and more is that human beings, one of our specialties, one of our cards of our species, is that we happen to be social. And in fact, my colleagues say we even have a socially gated brain.

And we are learning now -- I'm just going to put this out there because I think it's so darn cool -- we are learning now that you can have what we're calling in the field as a fancy term, neuro synchrony. But we're actually measuring by putting caps on little kids, and kids in schools, on the teacher, and on the students. And you can actually watch when the teacher and the students move into synchrony. And indeed, that is the time when the students learn more. And you see that especially in young kids, babies, and their mothers.

So, I believe that we can't get away, shouldn't get away, would be trading away what is most important to our species if we ever say that we can substitute the social experience for a nonsocial experience. Now, again, how you define that social experience is going to be important. I don't think it should be in, I think, Anant, you mentioned this too, it just can't be directive. It probably has to be more guide on the side as King says, and not sage on the stage.

MS. SEGALL: Another question we had from the audience on ethics was a question from Julian Chang from the Chinese Globalization Association, who said who will have the responsibility for safety and security in the metaverse? Will there be cordoned off spaces so that it's actually a series of multiple metaverses? And, you know, this is actually this was something someone else just asked from the audience in light of harassment issues already popping up in these virtual spaces, how do we expect to protect entire classrooms or even schools in these spaces?

We're already having safety issues in schools. And so, if we add a whole new virtual element, and it certainly seems like many of our tech companies have had trouble with safety and children for a very long time. What are the things we can do early on to protect our children in these environments? Rebecca -- or sorry, go ahead, Kevin.

MR. CLARK: I think one thing is to be able to verify authenticity and identity. I mean, we know who's on a flight. We know, you know, and so, when we make these comparisons between brick and mortar, you know, a school, and the metaverse, one of the keys is that when we show up to a school to pick up our child or to go on a field trip, we are authenticated. And so, we need to figure out how to include that in instantiations of the metaverse.

Now, I think there could be some areas that are more open but when we talk about child safety, one of the main issues should be that we should know who is on the other end of that comment of that content. And I think that's something that we need to tackle early on.

MS. KANTAR: I'd second. I also think, you know, at Roblox, we talk a lot about age verification and also context being important in determining what the norms and expectations are when you're in a private chat with one other person. In real life, you have different views, and you might make different comments than when you're in a public setting and you know the whole world's watching, and same thing in the metaverse.

But I think most importantly for parents, for educators, for schools, you know, there are existing regulations that certainly at Roblox we mind, and we appreciate. And those might limit it, for example, when students can talk to other students and what jurisdiction. Can they only talk to students in their class? Can they not talk to students in their class? Only if an educator is present? What about

other students in other schools? If they have a pen pal school, is that allowed?

So, a lot of districts and states have, and whole nations have developed privacy policies, and student data privacy policies that, of course, all of these companies, Roblox included, need to mind. But I also think there's a need for parents to take a really active role in getting to know those parental controls and restrictions that most platforms offer. And if they don't offer them, you know, maybe demand it, or leave. But thinking about that responsibility of parents, of educators, of communities to help upskill all of us on what it means to set up a student for success and safety and stability in their metaverse learning.

MS. SEGALL: I want to get into the digital divide, right? I think we're on the cusp of -- every time we hear this could be a more equitable world, this is a place where our children could have access in ways they didn't. There's always the other side of this. And so, Simran, I saw something you wrote that I just thought was really interesting about how you were inspired by an English grammar school that you taught in in Mumbai back in I think this was 2013. And it really it inspired what you do today.

And I want to use this as a way to get into how we're going to chat about the digital divide and how we can be careful about this. Let's just start with can you talk about your experience back in 2013, and what it taught you about education in that divide.

MR. MULCHANDANI: Sure. So, yeah, just for everyone's benefit, I was always interested in teaching. I was an investment banker and got into entertainment. And I was invited to teach a class of fourth graders English. Just for context in Mumbai, India. And in this fourth-grade class of mine, I had, you know, eight-year-olds. I had 14-year-olds. And guess what? All the girls were 12, 13, and 14. And why was that? They were being denied education. They were being sent to their villages to work in the fields. They were being violently abused at home. And in the class was also an autistic girl.

And caught up in this cocktail of abilities, you know, of different aspirations and dreams, we were delivering the same cookie cutter solution to all these kids. And not even thinking about the, you know, variability of learning and not even thinking about how the individuals we were talking to.

And so, this became kind of like my inspiration, as it were, to begin working on Rangeet. And I was not interested in bringing the core curriculum to kids better. I was interested in providing them

with the scaffolding that would help them to be better learners. And so, Rangeet started from, you know, from that perspective.

I want to pick up with what Kathy said a little while ago, you know, and talk about how, you know, we've had such massive lockdowns in India over the last 2-1/2 years. You know, schools have basically been shut. The kind of social and emotional impact this has had on children is profound. The anxiety that we've seen in children is massive. And if we're just going to go back to school and tell kids here you go, here have more math and more science, I don't think we're going to have a great outcome.

So, I think, you know, I think it's crucial that we have, you know, we retain the teacher as the pivotal element in the classroom. It's crucial, you know. I mean, kids are so influenced by what's going on at home. You know, for example, you know, what the metaverse is going to do, it is going to bring different opinions, et cetera, to the children. But still, they need that grounding in school when, you know, when they go into schools.

So, I think there's a lot, you know, a lot that we need to do here. But I think we must build absolutely on first principles, which is understanding what is the problem we're trying to solve? Let's not think tech first. Let's think classroom first. Let's think child first. Let's think about the problems we're trying to solve for children and then use technology to build from it. The other way is not going to work.

MS. SEGALL: Kevin, you know, I hear Simran talking. Many of you guys have mentioned the impact on a child's learning of just being home over COVID and not being able to be in person. And I saw something you wrote about how it's been impactful for children who have been home over COVID, and they've been consuming a lot of media. And you said that there are not enough authentic multidimensional characters in children's media. And so, it's been hard for children who are home looking at certain types of content, not seeing diverse characters and that's furthering a problem.

And so, I'm curious. When you talk about the lack of diversity in the content our children see, as we're thinking about building out a whole new medium where there will be all new content opportunities, what's your advice for building out content for the metaverse that is diverse? That's, you know, you talk about, you know, getting away from the topicalization. Can you get into what would be a healthy way to build out diverse content in the metaverse?

MR. CLARK: Right, right. Well, there's been research that shows that the more that some children consume media, the less -- or that it increases or decreases their self-esteem, right? Particularly for children of color and girls. And so, part of the challenge is the images that they're consuming aren't enriching to them.

And so, the way to combat that is early on, is to make sure you have multiple points of view. You have multiple different types of creators, inclusion. That you have people who represent different constituent groups, right? That, you know, let's face it, systems are created by humans. And so, they'll be inherently bias based on the humans that create them. That's not saying people are bad. That's just saying people tend to build stuff based on their own preconceived notions.

And so, the way to combat that is to make sure that we have enough people and representation to include as many iterations as you can. I did some work with a community where we were trying to get them to use technology. And the first step was someone told -- the grantor paid me to go in and teach them how to become certified. And I realized after talking with them, they didn't need to be certified. They needed to figure out how to use technology to tell their stories, to communicate with their friends and family, to learn, to collaborate, to have access to resources.

The only way I found out that that's what they wanted was I asked them. And so, I think as we go down this journey of putting together the metaverse and applying it to education, we need to ask. And we need to ask people in rural communities, urban communities, from different demographics, from different family situations. They need to be a part of the process in a valuable and significant way. Not as a consultant or in a consultative way but in a decision-making way from the very beginning.

MS. KANTAR: Great. I just want to add --

MR. AGARWAL: We are learning -- if I might weigh in very quickly. While we talk about, you know, how we design the metaverse and do it in the right way, I do want us not to lose sight of the incredible opportunity here, which is that if you look at the physical verse, our universe, it is very hard, much harder to create diversity, a universal, you know, diversity uniformly across the world. You know, I grew up in India. And, you know, most people, you know, look like me, Brown people. And I came to the U.S., and we live in a town where it's mostly White people.

And when, you know, my wife and I walk our dog, you know, everybody looks different from us. And in physical spaces, it's actually very hard to create diverse experiences because our society by its very nature, you know, humans that look alike and speak alike and think alike rubber-band together. You know human nature is, you know, non-diversity increasing.

And so, but in the metaverse the beauty is that now we can synthesize and make sure that people see much more diverse experiences by creating a metaverse that looks diverse. It's much easier to do that than in the physical world. And so, I would like us not to lose sight of the incredible opportunity that this new technology is giving us, rather than viewing it as a problem.

MS. SEGALL: Yeah. Rebecca, you --

MR. MULCHANDANI: May I add to that -- sorry.

MS. SEGALL: No, sure. Go ahead.

MR. MULCHANDANI: Sorry. So, I'd love to just add to what Anant just said. You know, we've at Rangeet, one of the -- and it's a slight diversion -- one of the things we do we focus on a lot is teaching children about ecology and their ecological systems. And at a recent virtual climate conference -- and here's the jump off from what Anant said -- we cohosted, you know, students from 15 countries. And it was fascinating. It was a Zoom call. It was fascinating watching these kids. And they had no fear, right? They were kids from a little village in Rajasthan in India, which is a desert state, right? They only spoke Hindi. There were kids from, you know, the United Kingdom, Japan, Korea. And us adults stood into kind of moderate and translate. And the kids had no fear, like I said.

And the kids, we witnessed these children describing their own lives and their context to each other. So, it was really funny like when the kids in -- you know, they were talking about what pets they had. You know, most had dogs and horses but all the kids in Rajasthan had goats. And the kids from -- the kids in the UK had no idea. They were like why do they all have goats? Because they all lived in farms. So, they couldn't visualize the context that they were talking to these. So, the people didn't understand the context.

When they also talked about -- it was really fascinating, they started talking about the climate action they were taking in their own lives. And this I found super exciting. You know, there were

kids in the UK who were talking about things that we would talk about. The kids from Rajasthan were describing how they came from a desert, and they never had water and how they petitioned the town council to build two wells so that there was no more feast and famine.

And I just think in this new paradigm, and I really agree with Anant, you know, there's lots of things we need to think about. But just imagine if these kids could travel miles through the metaverse, to live each other's experiences and how that would lead to such great emotion and great understanding. That would transcend not just how they can react to urgent issues like climate change, but also how they will actually understand each other human to human.

MS. SEGALL: Kathy, in the paper you talk about, and this is getting to the digital divide, because that vision is wonderful. This idea of connection and empathy and bringing people, children together from all across the globe. You talk about the peril of how many diverse and marginalized communities, particularly in rural areas, might not have access to consistent, reliable broadband. This isn't a new conversation. But this will definitely be a new conversation when it comes to the metaverse and different type of technology. And so, how do we ensure that everyone has the right to participate in the metaverse?

MS. HIRSH-PASEK: I think you've raised a biggie now because is going to, you know, it's obviously going to fall on governments to make sure that people have access to broadband. And by the way, to developers to make sure that the clunky and often very expensive way in which you can access the metaverse is really available to people. I know there's things under development. They'll be much cheaper and much more usable. But that's a policy issue and I think we have to work hard together to solve that policy issue.

I wonder if I can move backwards one second too to just say that I heard some commonalities that I find very exciting. And I just want to pull them out for just one second. I think Kevin and Anant and Simran, you mentioned two things that are so incredibly cool. One is the opportunity that this is going to afford us. And the second is the opportunity for us, as Jonathan Sachs says, to build it together. And I think quite often we're in a situation where people build something and then they somehow descend it upon other people. You know, give it away to other people. Well, that's not really

building it together.

Or Jonathan says, okay, then you have a second model where you have the guesthouse model. Where you have the guesthouse and people are able to come in, you know, but they're still guests, you know. They're not really full participants. And I think in many ways, whether it's the tech industry or frankly, even in the way we do science, we have been coming top down instead of hearing all the voices and allowing for the full opportunity of all people to participate. And Anant, I think you have more to say than I here. But I think it's very exciting that we are at least starting this by suggesting that we are open to all voices and really want to hear people. And not just hear them, develop the system with them.

One more point and then I promise to lend it to everybody else. Which is there are midlevel solutions, right, that communities can do. For example, not every school has an IMAX, right? So, you can't have a field trip where the classes go to the IMAX. And maybe in the interim what you have are community metaverse spaces where people sign up to go to those spaces so they can tap into different worlds and different universes and experience that diversity. And eventually maybe, maybe we're going to come to whiteboard classrooms where the metaverse really will be the way the school of the future looks.

MS. KANTAR: Laurie, if I could, I just have a few points that I think to bring the academic community and maybe to be a little bit contrarian, I'd say one -- there's an underwhelming amount of research on this question of representation identity on the role of avatars and how avatars do or do not enhance student learning. We actually have a lot of research about avatars in assessment and how they impede or cause challenges through assessment.

But we have fewer on learning experiences and the role of identity projection that at least so many kids who are on Roblox talk about when they describe their avatar. I mean, I'm always amazed. An eight-year-old will tell you that they change their avatar's clothes every day to reflect the weather. Or that they might not want to bring the same avatar into one experience with some friends as they would into class.

So, I think understanding and digging in more into that relationship. And is there a

conduit for building confidence in oneself in a student's projection of themselves in all these different roles and environments and achieving a lot in the metaverse in their avatar extension of their identity.

And second, I think, is we've also as a field, it's really romantic and I think important at the same time of course to go bottoms up. What matters? What do we need to be teaching kids? How do we know that? What do communities want to be learning? What do students want? At the same time, there is an oppressive top-down permission structure in the learning system that governs how schools in the formal education system works. So, there's a lot of opportunity for sure in informal learning contexts.

But when we talk about the school today, I think there are real pressures there. And it does no one any good to ignore them right now. We can actively work to change them. But in the meantime, I want us to be thinking about, you know, if rigor and demonstrating mastery of content or skills is still par for the course in having footprint in time in the traditional school day, no matter the country, is there a way for us to bring to bear more measurement, more evidence that these learning environments are actually achieving something different and deeper.

Because if we can't ever demonstrate that, if we never learn how to assess in these environments, and I'm not saying high stakes assessment, but just assessments that learning happened, or that skills are being developed over multiple times of engagement, it's kind of a fluffy case to make. It's kind of like, well, this is exciting. It's interesting. It's new. Let's bring it in.

I don't think that's where the metaverse educational space wants to go. If we're making the argument that this should take class time in the form of a field trip, or in the form of a one-day lesson, or in the form of five days a week, then I think we should substantiate that with some demonstrable learning gains. And I hope the academic community partners with all of us who are providers or enabling providers in being able to tell that story.

So, I think that's just two areas of ask I have for everyone perhaps listening who might be in an institution that might partner with companies and developers who are building this content to help advance both of those threads.

MS. HIRSH-PASEK: I know I speak for a lot of my colleagues in saying bring it on. We

totally want to be there and to do that research with you. And we've been doing a lot of it with other industry partners like Sesame or Nick. So, please, please, we want to be a part of it, and I think the only fear some of us have is that sometimes academicians are a little slower than people in tech. So, it takes a little while for that research to kind of mature. And you guys are moving on so fast that by the time we get it out, you kind of say to us, well, how come you studied something so old? But we're there.

MS. SEGALL: I love too, Rebecca, you kind of mentioning the digital avatars and whatnot. I just think identity and our children's identity in these new virtual spaces they already put so much weight on their virtual existence, the idea that one day their virtual existence they could put almost more weight on than their physical existence, I mean, there's so many interesting concepts there. And there's so much for you guys to be thinking about with that, right?

And so, it's important that we are thinking about that and it's important that gaming developers are thinking about that, and educators are thinking about that because it's psychology, but that's also technology. So, it's interesting to hear you talk about it.

So, we're wrapping in a bit. I'm curious, as, you know, I've interviewed Mark Zuckerberg many times and asked him some ethical issues about the future. And so, I'm curious, just because you guys are all experts in this space, you are all pros. If you were sitting in front of Mark Zuckerberg right now who has now transformed Facebook into meta -- I know this is a curveball, guys, sorry. It's end of hour. He's now transformed Facebook into meta believing that he's going to build out this metaverse and that this is the future, very long on a metaverse-like environment for the future.

What is the one piece of advice you would give him? The single most important thing you think he could do to make sure that we don't repeat the same mistakes of the last decade. Bit of a lightening round, but a very difficult one. So, whoever wants to take the first stab at it gets extra bonus points.

MS. KANTAR: I'll go.

MS. SEGALL: Rebecca.

MS. KANTAR: I think most important number one is make sure that the pursuit of profit doesn't come at all costs. How do you structure the business model, the core of how you make money, to

be good for humanity, not bad?

MS. SEGALL: Okay.

MR. ARGARWAL: I would say an important point would be, you know, being a techy myself, be sure that domain-specific experiences are not built by people who don't understand those domains. Like education, for example, make sure that you find just as an example for education, people who have good domain knowledge like professors or are also engineers, or schoolteachers or are also, you know, well versed in learning science, get them involved from the very, very early days as opposed to backpedaling once the tech has gone too far.

MS. SEGALL: Okay.

MR. CLARK: My simple piece of advice would be listen. Listen to people at all levels of use because it's a continuum. Some people are light users, and some people are expert users. And you need to listen to all of them to make sure that this huge all-encompassing system meets the needs of all of those constituent groups.

MS. SEGALL: Okay.

MS. HIRSH-PASEK: There's so many good things that have been said that I'll just add one more to the list. So, thank you guys for saying it all so beautifully first. That I'm going to reiterate that metaverse can't substitute for social interaction, it can supplement.

MR. MULCHANDANI: Yeah, and I'll just add, you know, I have to echo what Anant said earlier once again that we have to build, bring in domain experts. We have to build classroom first, not tech first, and not profit first. I totally agree. We have to build. If we're building education, we need to build, to really understand the education problem, which I know takes good educators, based on solid pedagogy, based on learning science. And yeah, I mean, I think that's the advice I would have. You know, bring in the domain -- bring in the domain experts early.

MS. KANTAR: Great. Just really quick. I think reflected in everyone's comments there's also a theme -- this is unrelated to Mark Zuckerberg -- but for those who are building edtech solutions, I think in general there's a need to have humility and to understand all of our contexts in the system that while we all like to rail on it for moving NAEP or PISA scores or whatever over the last 50 years in a

meaningful way. It certainly has deficiencies. But it also has a lot of complexity and a lot of good reasons sometimes behind why things are the way they are. Or why they are hard to change, right? You don't want standards whiplash and curricular whiplash where every other year kids are learning totally different things.

So, there are some good reasons. And I just think there's a tendency for Silicon Valley to come in and say let's blow the whole thing up and make it in our own incarnation. And I think that's naive, and we have a better opportunity here to appreciate the complexity and mind it and be humble in our attempt to find the highest and best way to bring the metaverse in.

MS. SEGALL: And I hear a lot of those same things, right? We can't forget about the human, right? These are very -- these are things that we have learned from the last decade and that I hear you guys saying early on. We cannot forget about the human. We need more diverse voices in. I am curious like if there's a certain action item on this. I mean, obviously tech developers are developing this. I have spoken to the folks from Fortnite and Sandbox and Decentraland and like this is happening in some capacity, right? Where it lands.

So, how do we make sure that psychologists, that educators, that scientists have a seat at the table at this go around. I know this paper, Kathy and Kevin, this is a part of it. How do we make sure that this isn't lip service and that people actually get a seat at the table for round three of the internet?

MS. HIRSH-PASEK: Well, I hope we'll have an invitation and I hope that people are willing to wait a little bit longer to do quality, as Rebecca mentioned. I know many of my colleagues are here and ready to be available. We've been doing science for a long time. We have suites of principles that we could apply. That's what we wrote in our paper that Kevin and I and our other colleagues wrote. Please, please take a look. Know we're here. And know we really do want to help not to cut profits, but to make sure that whatever is put out in the world is actually of high enough quality that it helps children and families.

MS. SEGALL: And I know we got to wrap. But I want to end with a quick lightening round question because you guys are all at the forefront of your industries. Why is this personal to you

guys? Each of you guys have such different backgrounds and reasons for why you're doing what you're doing. Why is this personal?

MR. MULCHANDANI: I'm inspired by one of our advisors at Rangeet who said this, and it keeps me committed. He said we're living in schools that are solving the problems of 25 years ago. Wonderful math teaching, but not if there are no elephants left to count. Amazing redesign of English, but not if there are no forests left to describe. And I want to make sure that I give my children and their children an opportunity to have the same kind of opportunities in the world that we have.

MR. CLARK: And for me, it's personal because I just want to make sure that all children and young people see themselves, their communities, and get their educational and social needs met through the digital and media that they consume. Simple as that.

MS. HIRSH-PASEK: It kills me when we know so much, and we use so little. And I guess the very basic principle is I have grandkids and I want the world that they grow up in to be optimized for them because I know that with the right tools the next generation can solve anything that comes their way.

MR. ARGARWAL: To me, this is, you know, utterly personal because, you know, we all know education is a human right. And, you know, technology is completely transforming the world. And I want to be part of those technologists that create technologies to change the world to make education accessible, quality education, deep education, accessible to everybody everywhere. And I think we can do that as technologists.

MS. KANTAR: I think for me our work is just a part of this, but it's important as we have more and more challenges to a notion of truth and a notion of information and facts that we have minds that are capable of discerning what's fact and what's fiction and of dealing with the complexities of the world and not shying away, but instead facing them head-on and feeling like they have agency. So, I think it's imperative for nations and for international peace and wellbeing and reducing suffering that our humans are building strong minds and the ability to interact with each other with strong character as well.

MS. SEGALL: Great. Guys, thank you all for joining. Thanks to our panelists and for the audience for tuning in. And I think I speak for everyone on this panel when I say this is the beginning of

the conversation, just a start. And if you guys listening want to dig deeper, the policy brief is hyperlinked at the event page and I'm sure there will be much, much more content coming out about this. And you can look to all the folks on this panel as leaders in this space in what they're talking about.

So, thank you all and have a great day. Thank you, guys.

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