THE BROOKINGS INSTITUTION – FALK AUDITORIUM

BUILDING THE WORKFORCE OF THE FUTURE:
RESILIENT PEOPLE AND PLACES

Washington, D.C. – Tuesday, May 21, 2019

PARTICIPANTS:

Welcome and Opening Remarks:

JOHN R. ALLEN, President, The Brookings Institution

REBECCA WINTHROP, Senior Fellow and Director,
Center for Universal Education, The Brookings Institution

Session 1: Development Resilient People and Places: What is at Stake?:

JIM SHELTON, Moderator, Senior Advisor, Chan Zuckerberg Initiative

REPRESENTATIVE RO KHANNA (D-CA), U.S. House of Representatives

NEETI MEHTA, Senior Vice President,
Brand Strategy and Culture Architect and Co-Founder, Automation Anywhere

Session 2: How Can Cities Grow and Create Inclusive Opportunities for Employment and Mobility?:

CAMILLE BUSETTE, Moderator, Senior Fellow and Director,
Race, Prosperity, and Inclusion Initiative, The Brookings Institution

MARCELA ESCOBARI, Presentation, Senior Fellow,
Center for Universal Education, The Brookings Institution

BILL AVEY, Vice President and General Manager, Personal Systems Services
HP, Inc.

SCOTT JENSEN, Director, Department of Labor and Training, Rhode Island

THOMAS SEEWOESTER, Vice President of Site Operations, Amgen Rhode Island

Session 3: How Can K-12 Education System Effectively Support Young People for the World of Work?:

REBECCA WINTHROP, Moderator, Senior Fellow and Director,
Center for Universal Education, The Brookings Institution

ESTHER CARE, Senior Fellow, Center for Universal Education
The Brookings Institution

ED HIDALGO, Chief of Innovation and Engagement and Officer
Cajon Valley Union Student District

JUSTIN RYDSTROM, Head of School/Chief Executive Officer
IDEA Public Charter School

Session 4: Pathways to Prosperity: How Can Postsecondary Education and Adult Learning Opportunities Help Develop Resilient People in the Digital Age?:

MARCELA ESCOBARI, Moderator, Senior Fellow, Center for Universal Education
The Brookings Institution

MARY ANN GILMER, Vice President of Mission Services
Goodwill Industries of the Valleys

DAVID GOLDBERG, Founder, CSMlearn

GORDON JONES, Founding Dean, College of Innovation, Boise State

MARTHA ROSS, Fellow, Metropolitan Policy Program, The Brookings Institution

Session 5: Fireside Chat and Closing: A Local Perspective on Developing Resilient People and Places:

JIM SHELTON, Senior Advisor, Chan Zuckerberg Initiative

STEPHEN MORET, President and Chief Executive Officer
Virginia Economic Development Partnership

* * * * *

P R O C E E D I N G S

GENERAL ALLEN: Well, good morning, ladies and gentlemen. I'm John Allen. I'm the president of The Brookings Institution and it is a great pleasure to welcome you all here today to "Building the Workforce of the Future: Resilient People and Places," which is a symposium co-hosted by the Brookings Center for Universal Education and our Future of the Middle Class Initiative.

This symposium brings together the economic development and education communities to discuss strategies for addressing the future of work and, of course, the skills needed in a changing world. Both of these communities are understandably concerned about the development of resilient peoples and places in this fast-changing, technology-driven market. But often these communities are not the same conversation.

Today we hope to facilitate that important conversation and that connection. And to that end we're very pleased to be joined by a true leader in this field, the Mastercard Center for Inclusive Growth. Now, after receiving its federal tax break in 2018, Mastercard did what few corporations dared to do. And with that landmark windfall, invested back into society by growing their Center for Inclusive Growth through a $500 million investment.

Now, Brookings was honored to be among the first of its grantees, and much of the research you'll hear about later today was made possible specifically because of Mastercard's philanthropic vision and its investment. And I'd like to personally recognize Parag Mehta, who will join us a bit later, who is the executive director of the Center for Inclusive Growth, as well as his colleagues for their generous support for our work in this field.

Now, later this afternoon you'll also hear about breakthrough research that Brookings is conducting on work with low-wage workers and what it will take for them to engage in lifelong learning and to seize opportunities for upward mobility. For this I'd like to thank Google.org and Andrew Dunckelman for his great support. And he leads their Education and Economic Opportunity efforts and our sincere thanks to that organization and

to Andrew for his consistent encouragement and support there, as well.

And now onward on to today's programming. We convened policymakers, practitioners, researchers, and thought leaders from government and corporation and nonprofit sectors. We've done this to discuss education and economic development strategies that can provide locally relevant solutions to enhance economic and social mobility.

You'll also hear about some new research that Brookings Senior Fellow Marcela Escobari is doing to include into a report called "Growing Cities That Work for All: A Capability-Based Approach to Regional Economic Competitiveness," and we're very proud of that work. As well as additional work in collaboration that Marcela is doing with Brookings Fellow Martha Ross on strategies for reskilling low-wage workers.

So it's our mission today for you to leave with actionable insights into what is required to build an inclusive economy and to do so into the future where all Americans can participate on a basis of equality. It's something I know all of us here are deeply concerned about and care about in a very important way. And I want to thank you all for joining us this morning for this event.

In just a few short moments I'll ask Rebecca Winthrop, Brookings Senior Fellow and Director of the Center for Universal Education, to take the stage to speak more on the framing of the day and the important work of her Center. And Rebecca's own research focuses on education globally, in particular promoting quality education for the most marginalized. And she explores how education innovations can leapfrog educational progress. And you would be hard-pressed to find a better leader and expert to kick of the substance of today's symposium.

Two housekeeping notes. We are going out over webcast, so for those of you joining us on the Internet, you're most welcome today and we're grateful for your presence. And this is very much on the record.

So ladies and gentlemen, if you would, please join me in welcoming to the

stage Brookings Senior Fellow and Director Rebecca Winthrop. Thank you very much. (Applause)

MS. WINTHROP: Wow, what a warm welcome. I should take you everywhere with me, John. (Laughter)

Welcome to everybody. Thank you for joining us. Thank you for those of you who are on the webcast. And John, thank you for your leadership. Those of you who are not Brookings scholars may not know that this is a topic today that is very near and dear to John's heart. He has been championing it since he came in, so it's a real pleasure to just give you a few words of what we're going to be doing today. We've got a packed schedule.

This is our Center for Universal Education's Spring Research and Policy Symposium. We pick a different topic every year. And for those of you who don't know about our work at the Center, we work on education and skilling across the life span, from early childhood on up, and around the globe. We have a deep commitment to the importance and benefits of sharing lessons across borders. And the U.N. Sustainable Development Goal on education, which came about not too long ago, focuses on lifelong learning. And we thought it would be a perfect opportunity to dive in deeply in the U.S., the U.S. is part of the globe after all, and look at lifelong learning.

And we are really, really grateful to our partners across the institution who we are doing this with and co-hosting with, most particularly the Future of the Middle Class Initiative. This is a cross-Brookings initiative. A big thanks to Richard Reeves, who's the director of it and who's been deeply engaged in brainstorming from the beginning what we should be thinking about and framing. A big thanks to Camille Busette, who herself embodies cross-Brookings collaboration. She's appointed to not -- not a dual appointment, but to three different studies: Governance Studies, Economic Studies, Metropolitan Studies. So we're really thrilled about that.

The initiative is really focused on improving the quality of life for Americans in the middle class and increasing the number of people who can join the middle class. And

this is a very hot topic. I think many of you in the room probably work on it yourselves or read about it in the paper. This idea of our changing economy and the implications it has for people's lives is of grave concern to many of us, particularly here in the U.S., but also around the world.

And there are two things that I'm particularly excited about today. One is I love, frankly, personally, nothing better than crossing boundaries, whether they're national boundaries or disciplinary boundaries, to come up with diverse approaches and insights to create new solutions. And we're going to be doing -- we've been doing that and we're going to be sharing that with you today. We really wanted the tenor of the conversation to be solutions-focused and really try to think differently about what can we do about this phenomenon and this topic.

We will have, as John referenced earlier, we will have some really interesting research that we're doing together with the Metropolitan Studies Program and their scholars that takes from the field of global economic development some data and analysis approaches, and applies them to U.S. cities. And that has actually been really helpful in helping think through what we need to do for building both resilient places and resilient people.

And the other thing which John also mentioned that I think is really helpful is to bring the economic development conversation together with the education conversation. That is, this is not a topic where you can educate your way out of it alone. It's also not a topic where you can create jobs and build growth alone without building the talent in and pipeline for that, so you need both in the same room.

So with that, that's sort of our goal today. And what we're going to do is kick off with a scene-setting framing discussion and keynote, which I'll tell you about a little bit in a minute. We'll have a coffee break. We'll move into a session that's really looking at building resilient places. We'll have a networking lunch. Feel free to stick around, join us, grab your food, talk to other people.

After lunch we'll be focusing on how to build resilient people, looking at the K through 12 system and also higher education, lifelong learning. And then we'll close the day by looking at how these issues come together in one particular place in Northern Virginia. And then we'll have drinks, alcohol, food at the end of the day. (Laughter) So if you make it through, that is your reward. No, we have a lot of fantastic people joining us.

And I'm very grateful, I just want to say a word of thanks. You will see a few of us repeatedly throughout the day. I'm very grateful to Marcela Escobari, Jim Shelton, Camille Busette. The four of us have been sort of thinking throughout the last couple months about how to frame the day, what the topics are, who to invite, how to curate this conversation. So you will see us moderating different discussions as the day goes on. So thank you, guys, all of you.

So to kick us off I am really pleased to have Representative Ro Khanna with us and co-founder of Automation Anywhere Neeti Mehta with us, who's going to have a conversation from California's 17th District both as a political representative and as a CEO of a major company in that district.

And there's no one better, I think, to frame the conversation than my friend and colleague Jim Shelton, who has spent many years in government service as the Deputy Secretary of Education for the Department of Education; most recently was heading the Chan Zuckerberg Initiative's Education Program; and is soon to join us as a nonresident senior fellow here at Brookings. He thinks very deeply about how to make people's lives better in this country. He's very reflective and incredibly passionate and committed about making a difference.

So, Jim, welcome to the stage. (Applause)

SESSION 1

MR. SHELTON: So, good morning. I know this is a normal Brookings thing, but I'm from education, so when I say good morning, you say?

GROUP: Good morning.

MR. SHELTON: I got it, very good. So I need to say thank you, as well, for the extremely generous introduction. I think that one of the things that's really started to come to mind for me is that the reality is, despite all the things you hear in an introduction, for me I have to remember myself as an ordinary man who had extraordinary opportunity. An ordinary man with extraordinary opportunity. And because of that I've been able to do a lot of things in my life.

And if we each think about the opportunities that we've had and how it's shaped the context that we're in and the experiences that we have and the relationships that we have, and recognize the role that has played in the arc of our lives, then it puts a lot of the rest in historical context.

Now, having said all that, I do have one superpower. Somebody asked me this, like to do a little icebreaker the other day. And I was like, what is my superpower? And it is I consistently can place myself in circles where I'm surrounded by people who are much smarter and better than I am. (Laughter) So I'm honored to be here with Rebecca and the team and having met Marcela.

So sometimes it is much better to be lucky than good. And there was a part to the frame that I'm going to talk about that I just could not figure it out. And literally, my first day, I wound up sitting down next to Marcela and was like she's about to answer this question for me. So let me jump in really quickly.

I think it's really important for us to remember that -- sorry, I got to remember I got to stand here at this podium. I think it's important for us to remember that for a lot of people, frankly, for all of us, there's a reason that we should keep referencing great America: our stated ideals, the leadership we've been able to have over the last century or two almost, the role that we played in the world. There are reasons that we refer to America being great. And yet, the world is getting scary to people and for good reason.

Now, by now many of you, if not all of you, are familiar with the Raj Chetty data. Raj Chetty used big data for the first time from the IRS to map what has happened to

people's incomes over time and was able to show what exactly has happened to the American dream. Now, what this chart shows is the percent of Americans who could expect to do better, who actually did better than their parents in terms of annual income. And what you can see basically is that in the 1940s, about 90 percent of Americans could expect to do better than their parents. And the last he could calculate, we dropped that being about half.

So this insecurity, this sense that we're not doing better, that the promise of being able to do better than your parents if you did what you were asked, it feels at risk. And in fact, for many Americans it actually is at risk, it's not happening anymore.

Now, other things have been happening, like our quality overall has been going up. We've made tremendous strides in progress. But this feeling is real. And it's exacerbated by two things.

On the right-hand side, what you see is the inequality that we know all too well. And this is about income, that's not even about wealth yet.

On the left-hand side is a chart created by the Economic Innovation Group that describes where 50 percent of the jobs came from after the last recession. And basically, 50 percent of the jobs grew in 3 percent of counties. So what that means is that those people who are saying opportunity is happening in America, just not near us, like what they feel is real, too.

And if someone frames that for you around, well, what are those people? Who is getting those jobs? Then all of a sudden, you associate who's getting opportunity, who's not getting opportunity, not necessarily with the macroeconomic trends, but with the people who seem to be getting what you wish you had. The numbers are real. How we frame them, up to us.

So what does that translate into? Again with Chetty's data, he showed us that pretty much, if you look on the left-hand side, nationally, red is, as usual, not great; blue is better. Red is where you are not likely to do better than your parents. And what you can see is at the national level there's a higher degree of variance across the country. But most

importantly, when you look within communities, that same level of disparity, if not greater disparity, actually exists.

Now, think about that. That means in the same communities, the same levels of resources roughly speaking, same companies, if you look at Washington, D.C., which we'll talk about at the end of the day, you are, unfortunately, not surprised to see that on one part of the city people do really well, even doing better than their parents who were probably doing pretty well themselves, and another part of the city, even though their parents were probably not doing very well at all, they're still not able to surpass them.

So I want us to stop for a second on this particular note because what this means is that, again, back to this promise, despite all of our best efforts, whether they were place-based or national, we're still in the position where where you live and who your parents are are most determinant of your life chances at least. You may be able to beat the odds, but your chances are most predicted by who your parents are and where you grow up. Now, I don't know what you were taught, but I was not taught that that's the way America's supposed to work.

So what does all that mean for Americans who have actually been behind for a long time? Well, one of the first things that we need to recognize is, again from the Raj Chetty data, he disaggregated the data. He found something really, really interesting. Definitely you see systemic bias across populations: race differences, income growth differences, et cetera, et cetera. But in particular he found for African American males that even if you actually made it to the upper rungs of income, which begins to, for most populations, inoculate you from the likelihood of falling behind and even your future generations falling behind, for African American males that's actually just not the case. In much larger percentages they fall not even down a rung, but down two, three, even back to the bottom.

Now, I say this because we often think about the challenge of the future of work in the context of addressing the first couple of things I talked about, the fact that the

changing landscape is coming, what we'll hear about in a little bit in terms of automation is going to displace jobs; that the mismatch of skills and the economy is actually making it harder and harder for Americans to do better. That is all true.

But it is also true, and we must recognize, that we weren't built on a perfect system before; that embedded in our system, in our laws, in our way of life has been whether it was from slavery or a lack of women's rights or the transfer of the feudal system to many parts of American society in terms of folks who started off as sharecroppers and whose families may still live in very similar circumstances, that inequity is built in. That bias is built into our systems. And it actually influences decisions and the resources that we allocate today.

As we recognize this, it means that the solutions that we're going to talk about have to not only overcome the challenges of the future, but actually compensate for the challenges of the past.

Now, I just want to remind people of one really simple thing. Does everyone remember the concept of compounding interest? Okay. So if you don't remember, when someone told you to remember to start planning your retirement, like the earlier you start, the better off you are. And if you start too late, it's too late, you can't make up for it later on. So one thing to just remember is what is it about the people who started saving two generations before you did? How did you catch up? Can you catch up?

And so if the compounding math basically means that the inequity is built in in a way that can't be overcome, what does that mean about the level of transformational change we have to find a way to make in order to begin to even talk about equity, let alone equality?

So to the solution side. You know, the fundamental problem that we have to solve is actually relatively straightforward. Here's where I'm going to try and bring it back up, I'm sorry. I should have warned them. I'm not really the great first speaker. I'm kind of a downer. (Laughter)

But the simple, but highly complex, problem is that when it comes to human development there are a set of milestones, and I've borrowed lots of this from the great work here that Belle Sawhill did at Brookings and in partnership with folks from Urban Institute, but there are certain milestones of no surprise to anyone, but that actually are well-grounded in the data, that unless you make it across successfully, you're likelihood of achieving thriving adulthood go down with every milestone that you miss. And so if we then want to get millions, millions more population level change, it means we have to get millions more people to cross through all or versions of all of these milestones, so that they can actually be prepared to live as thriving adults.

Now, we've been working on this for a while, but there are reasons to believe that, one, there are solutions in the world that work today that we can actually put into place; and second, that we actually have the ability to scale them in a way that people can afford in ways that we haven't before. Both of those things are really critically important. I'm going to assert that one of the biggest drivers of inequality is our inability to scale what people need to thrive affordably. And because we don't formulate the problem that way, we wind up missing really important parts of the solution. Each one of those words is important.

The other is we have people getting caught in impediments to progress that we actually know a lot about now how to deter: unplanned pregnancy, criminal justice system, mental health and addiction, extreme violence. We don't have complete solutions to any of these things, but we have partial and great solutions in many cases to many of them, oftentimes that we still don't make successful. So the question for us is when there is a solution that is known, what gets in our way of actually getting it done?

Now, another part to the reason that we don't hit our -- seize the opportunity to actually make dramatic change in these different areas is because we tend to think about them as fragmented issues. We think about individual development and education separate from the environment and the social environment that people find themselves in and who they know and the social capital they can bring. We think about it as separate from the built

environment that they're in, the availability of amenities and services in their communities, the cost of housing and how it eats into the work.

We say that we think about all of these things, but we think about all of them separate from each other. And it is actually only when you can actually bring them all together in systemic form that you get the compounding effect on the positive side of someone having the tools and resources to develop themselves, having the resources and connections to actually find opportunity, having the housing and stability and access to services to actually be able to build a thriving life, and then being in an economy that gives you the opportunity to actually put all of that to good work and build a prosperous future for yourself and your family.

And this is the question. You know, I can kind of see how to do all three of those, but it was not until I connected with Marcela, which she's going to talk about later, about how to be deliberate about building economies and matching skills to those economies to let people thrive. We spend a lot of money attracting people to open businesses that may or may not actually be benefiting the people who hope to serve.

This is her work. We have not only new tools in this area, we have new tools and resources and knowledge that we have about how to actually educate and develop people, how to accelerate the pace of learning, how to actually identify earlier when people need specific kinds of supports and scaffolding to make the transitions. These are all things where new knowledge and tools and resources create the opportunity for the kind of leapfrogs that Rebecca talked about.

These are the things that we want to start to frame today as solutions. We're only touching on a piece of them, but it begins to lay the frame for many more to come.

The kinds of things that I want to close talking about are the kinds of things we need to consider as we talk about solutions going forward. You know, I've had the opportunity to work in the private sector, in government, in the nonprofit and philanthropic

sector, and the frustration I had when I left the administration was I could not figure out why these things still, having worked in those sectors, were not coming together. And the reality is that often because we all approach our work without taking into consideration everything.

And the Einstein quote I love most is, "Everything should be as simple as it can be, but no simpler." So we're not going to solve poverty and mobility in a simple way. We have to actually figure out what the elements are.

So I already talked about the more systemic approach. We also need to recognize when we're talking about people, it takes holistic approaches. We've seen this, I want to separate these notions of the soft skills and the hard skills, et cetera, et cetera, et cetera, whatever language you want to use. But it is only when people have all the things they need to actually be able to develop and thrive that they're able to make full progress and realize their potential.

It's only when we begin to think about how these things land in place because everything lands in a place and that place context is different and that'll be something that Marcela talks about. But you can think about the kind of specific solutions and how to leverage the assets and infrastructure that happen to be in those places.

It's only when you think about how to achieve population level scale, getting it to all the people who need it, and design that in from the beginning that you recognize that the private sector, especially the philanthropic sector or the nonprofit sector, cannot do it without the public vision in mind. It also means that you don't focus on building the spoke solutions that are only going to serve a few. You have to design for scale in the beginning.

The last couple. Having worked across the sectors I can tell you we all operate with caricatures of what the other sectors think and try and do, even when we're trying to do the same work. And if we don't find a way to get much more intentionally cross-sector, to make the policy incentives such that they make the right thing to do the easier thing to do and the thing that gets rewarded, to create space for the private sector to do what they do best around innovation and scaling, to take advantage of the philanthropic resources

to fill gaps where the markets may fail and to do the kind of innovation work that can push us forward, if we don't find ways to weave those things together, the likelihood that we're going to make the kinds of systemic change at the pace that we need is actually relatively low.

We've got to work faster and we've got to work together to do it. Those two things don't often go together, but if we don't figure it out, the likelihood of our success, hmm, goes down dramatically.

Last two things. We tend not, especially in our place-based work, especially around complex issues, to try and wire ourselves for learning. Therefore, we do and repeat the same things over and over again, neither getting the insight from what works nor recognizing what fails, so we fail till we don't repeat the mistakes. So we have to build our communities in ways, and the data infrastructure and things like that, so we can actually begin to understand which of these supports and services and interventions are working for the people we're trying to serve.

You can imagine if we actually had that kind of infrastructure working across many, many cities. Folks that are smart, like the people here at Brookings, could figure out how to identify the patterns of what works for whom and in what context. But without that infrastructure we're stuck with trying to gather data from a variety of fragmented sources, mostly latent data and guessing. Said that way, it's not hard to see that's not a smart path.

And then finally, I thought a lot about this last one because the reality is I talk to my sons a lot about like when you want to achieve great things, there are four questions, but the first question is always what do you believe? Like what do you believe is possible? And what do you believe you can do? And I believe that's true for organizations and, frankly, for countries, as well.

And so if we don't start to cut at the heart of what people believe the potential of others are, what we believe our responsibility is to create real opportunity for everyone, if we don't begin to go after that in very clear ways where we address the narrative that is starting to actually pull us apart, even more than before, and then sustain

that, the likelihood that we run into the ceiling of our imaginations and of our generosity and our will to push goes down dramatically.

So the work of narrative change, the work of getting people to believe and to use that language, and then incorporate that into how they problem solve, that work is also important, as well.

I know all of you just need the data. (Laughter) But for everyone else we need to tell a story that let them understand why the future lies in the work ahead.

And with that, I will end my talk to get you to the people of substance. (Applause) So I'll take my seat.

You guys still with us? Okay, again, this is like the education thing, like call and response. You guys still with us?

GROUP: Yes.

MR. SHELTON: Okay, great. Thank you very much.

So welcome. First let me slightly introduce you to Neeti Mehta from Automation Anywhere and Representative Ro Khanna from the 17th District in California. We're going to spend a few minutes talking, but there'll be an opportunity for you to ask questions at the end.

I'm going to actually start with you, Neeti. Because everyone seems to have this broad conception that the future of work is hazardous or has risks in it for many, many Americans. I think people have visions of like robots taking out whole jobs and not taking out other jobs. But your company is in the business of thinking about the various ways in which automation will play out through society, through companies, and you are pushing for thinking about how it impacts whole communities.

So what I'd love is if you did two things. One is to both explain how your company works and what does it really look like in terms of the work it's done? And then the second is what does that look like when it impacts a company or a community, especially on let's get it clear about what happens in terms of when productivity increases and people lose

jobs?

MS. MEHTA: First of all, thank you for having me. It's absolutely a pleasure to be here.

Automation is a reality. Automation is here today. And technology in history and today has always been about human enablement. So how can we bring technology so that humans can be better off in the long term? That's the purpose of technology.

If you look at any industrial revolution that we've had so far in any context, whether it was mechanical, industrial, technological, it has advanced society. And what we want to make sure is that technology is part of the conversation as we uplift society. We are innovating there, but are we actually bring society with us with this innovation?

Automation anywhere is in the robotic process automation and digital workforce space. So we basically create software robots that will enable people to get rid of the repetitive and mundane work that they do.

MR. SHELTON: Because you said "robots." What does that mean?

MS. MEHTA: So software robots is just anything that you can kind of get a computer to do. It's specific technology that's a little bit democratized, and I'll talk about that. So, for example, automation in a traditional sense is something that you code. You know, it's a two-year endeavor. A company decides, oh, you know, this process has to be automated, it's too manual, it's taking too long, there are too many errors. You hire a bunch of coders. You code through it. You put a lot of money into it. Finally, the automation is ready and the process has changed. There's compliance, there's governance, there's new customer needs.

And so often, automation basically was not viable either economically or commercially. And so what RPA and the digital workforce has done is democratize this automation. Basically, it's a tool or a software that you can learn very easily an allows people to take care of the repetitive and mundane.

So we've created so many different applications. I mean, if you think about

a large enterprise in the U.S., they use anywhere between 2,000 and 3,000 different applications in their business. Now, just imagine the amount of data and the processes and the information passing between systems, and there's a lot of repetitive and mundane work, which is really not knowledge based. It doesn't bring into account human skillset, the creativity, the innovation that you can bring as a human, which machines can't. And so this digital workforce basically allows humans to take care of the repetitive and mundane. And so whether it's one person, whether it's a division, whether it's a team, whether it's a company, whether it's a country, basically it puts that in the hands of the people to get rid of that and get to that next level.

So I'll give you one quick statistic in that, is that based on all the automation that we see in the last 20, 30 years, we believe we've automated maybe 20 to 30 percent of everything that can be automated. With RPA and the digital workforce, we believe we'll get to about 60 to 70 percent. And so if you think about what is possible --

MR. SHELTON: Is there a timeframe?

MS. MEHTA: With a fairly large enterprise, then we're talking about the next two years, if that. So a couple of things.

One is just think what we've accomplished with 20 to 30 percent of automation. We've been to the moon, increased lifespan, brought up world wealth, taken care of certain diseases, et cetera, et cetera. And so now think with 70 percent automation what can be possible and what we can bring to the table. That's one part of it.

Two is the RPA and digital workforce industry is predicted to be anywhere in the future to about $100 billion, which is a huge industry. This is about having, for example, today's jobs, a lot of us use computers at work. Can you imagine going to work without a computer, especially in certain types of jobs? It's not possible. We believe the same for the software bots. We believe every human will be enabled by software bots to help it reach that next level of creativity, next level of knowledge work, next level of whatever they bring to the workplace. And that's the power of automation when it is democratized, which is what

this does.

MR. SHELTON: So let me push on that just a little bit. So you have a new $100 billion industry. There'll be employment associated with that. I don't know if you know what those numbers look like. Those things that that industry allows to be automated will eliminate the need for portions of jobs or whole jobs in the process. Do you have a sense of the impact on jobs of that level of automation?

MS. MEHTA: So we don't have an exact answer for that, of course.

MR. SHELTON: Of course. Of course.

MS. MEHTA: But what we see is that we created these jobs in the last 20, 30 years that dealt with a lot of data and a lot of repetition with that data. And so, yes, so every vertical, every industry, any country, every single industry will be impacted by this, 100 percent. So all industries will have certain jobs that might become a little bit more redundant than others, for example.

But today, for example, we don't have telephone operators moving -- you know, connecting lines manually. Those jobs are gone. But we have better communications, which led to a whole other industry, which led to so many other industries and so many more innovations around it.

Similarly, with this we believe that some of the repetitive and mundane jobs will kind of transition out, for want of a better word, but we haven't seen big job displacement yet. Because if you talk to most people in most industries, especially computer-related work, you'll see that about 20, 30 percent of their day is spent in admin work, is spent in repetitive work. They really don't want to do it. You know, transferring data from Excel to another application or, you know, copying and pasting or creating that same report again and again. You know, that's not knowledge work and they are very happy to get rid of that. It frees them up to think big, think outside the box, think with that data and see what else if possible.

So by and large, we believe, yes, there will be some transition. And that is why technology should be part of this conversation. How do we transition it better than we

have in the past?

But it is for the better. If we believe that this technology is going to get us to a better level of society, better level of work, better level of medical or better level of logistics, telecommunications, healthcare, it doesn't matter, then we must invest in it, we must train people for it, and we must transition through it.

MR. SHELTON: Thank you for that. And so two things inherent in what you described. One is that transition. So there'll be a lot of change in roles, some roles may be completely eliminated, and that disruptive force will hit companies and communities as they figure out how to make the transition probably, based on what you said, at an accelerated rate compared to others.

The second is for people to move to the higher value at work they have to have the skills for that. Is that fair?

MS. MEHTA: Absolutely.

MR. SHELTON: Okay. And so there's a mandate around the skills and competencies people need to be developing and they'd be able to play at the next level.

So, Representative Khanna, I wanted to talk to you about you've been pretty vocal on several different fronts. One is, for those who don't know, 17th District is in California, a lot of tech companies like some of the biggest, and if not the companies, then their founders live in your district. You spend a lot of time, though, talking about the responsibility of the tech industry. You also talk a lot about the changes coming and how it's impacting not only your district, but the rest of the country.

So I'd love for you to just talk about, broadly speaking, how you see the future of work, the risks at hand, and how we need to lean into it.

CONGRESSMAN KHANNA: I appreciate it. Thank you, Jim, for your excellent presentation. And thank you for your comments. And thank you, Brookings, for inviting me.

I agree that we are going through a technology revolution similar to the

Industrial Revolution. And the question and challenge is how do we make that revolution one that is going to be seen as empowering and opening up opportunity in communities in places left behind as opposed to diminishing those opportunities?

If you look at the Industrial Revolution there was income disparity for about 50 years. And in the beginning, people who could operate power looms were paid a premium. And then what happened is that many people learned how to operate power looms as the technology actually became less sophisticated and there became less of a premium on operating power looms because technology became more accessible.

Part of what could be happening even with artificial intelligence and robotics processing is the demystification of technology that actually allows it to be more accessible without the type of premiums that were necessary in much of the '90s and early 2000s.

And so then the question becomes what can we do to make sure that people are not just consumers of technology, but producers of technology? Every American is a consumer, more or less, of technology. And yet so many Americans feel like they are not participating in the production. They look at it and they say, well, there are going to be 6,000 uber millionaires in Ro's district and around there and I'm not even making $15 an hour driving an Uber. Something is wrong with this picture.

The President went and said it a little more starkly. You know, he went to a community and said you built America, all these new people have come in and they're making all the money. What happened to you? In a nutshell that was the President's message.

And so the challenge for us, I think, is how do we see technology to provide more economic opportunity by place? And it's both in rural communities and along race. You know, John Lewis is one of my heroes in Congress and I had gone down to Selma with him. And I was sharing my personal story of my grandfather, he had spent four years in jail with Gandhi and he taught, which I didn't know about, Reverend Lawson and how he brought some of Gandhi's teachings to the nonviolent movement here.

And at the end of it he said, Ro, technology rights are the new civil rights. You're never going to solve a racial wealth gap where the average African American has 7 cents to the dollar of someone who is white if there's no access to the places which are producing a large part of the wealth in the 21st century economy.

So much of our focus has been distribution after production, but if you don't give people access to the means of production, you may solve some of the income inequality, but you're never going to solve a lot of the wealth inequality. And then when you go to rural communities in some places and they want to have -- you know, I was in rural Iowa and someone said to me we don't want a handout and we don't want a ticket out. We want to have opportunity in these communities.

The average person, which I said to my mother on Mother's Day, I don't do this, the average person lives 18 miles away from their mother in this country when they grow up. Most people want to live in the communities that they grew up in. They want to live next to their families. We can't tell them I love Raj Chetty's work in terms of the economics, but the idea that to say go move, people don't want to move. People don't want to come live in Palo Alto or Fremont. They want to live and love in the communities that they've been in.

So our task, and we can discuss this more, is how do we crate the technology and opportunity in these communities so that they see that they have a better opportunity now than they ever have and that they don't have to move? That was the promise of technology. And the fight of the future is going to be whether we can deliver on that promise. Can we show that technology actually is going to be a liberating, transformational force where people have more economic opportunity in the communities they grew up in than they ever had before? If we succeed in that, I think we build to a more pluralistic, inclusive America. And the alternative is, is technology going to be the type of force that we've seen so far, which is colocation, economic concentration with a lot of people left out?

MR. SHELTON: So on that point, you have done a lot around creating a marketplace and then -- and you talk about the tools being easy enough for lots of people to learn. I call that putting the means of production in people's hand as Representative Khanna talked about. Talk about that and what you think it means in terms of opportunity.

And then I didn't catch the details. You did something about making the platform open to the public. I'm just trying to figure out how that fits into the mix.

MS. MEHTA: So at Automation Anywhere we do believe that technology is an enabler. And to Congressman Ro's point, it must be accessible. And so what we've tried to do from a corporate accountability and responsibility point of view is try and open up that platform to the public, so we have a community edition that is basically free. It is exactly the same as our corporate edition that all corporations use. And it is to put that in the hands of the people. So any person or small business could use this tool in order to better themselves or better their work environment, better change careers, you know, morph into certain other careers, or whatever else they might want to.

We also have Automation Anywhere University, again with the same concept, with bringing the training to the people. Because unless you can get trained and unless you can get trained by and large free, to some extent, how do you transition? How do you make sure the societies are able to transition? So we've done these two things.

We also have a community marketplace where you can say, you know, I've trained myself. I have the community platform now. I create those software bots and I can create an ecosystem where I can now sell it, I can rent it, I can monetize it. And therefore, create that economy around the bots and enable people to be part of that economy themselves, give them the means to do so.

MR. SHELTON: So it's basically an app store for bots.

MS. MEHTA: It's an app store for bots. And it is -- we have over 500 bots already. Now, these can be small bots, they can be end-to-end process bots. And again, the concept is how can we democratize it? Somebody might be a specialist in a small area,

somebody might be a specialist in a larger area, in a different vertical. How can we just enable them to do what they're really great at and bring that to commerce? Bring that to economically viable and sustainable for the society means.

MR. SHELTON: So some of the companies in Representative Khanna's district have -- well, talking about the app store analogue, have invested in building pretty broad and distributed developer communities. You guys have put the tools out there. Are you actively cultivating a developer community? And are you thinking about geographic distribution in that process?

MS. MEHTA: Absolutely. So we do a developer community where they are kind of more technical developers or subject matter experts as we call them, so they might do end-to-end processing. And then we also have communities where they are newbies, so they are business analysts who are creating bots because this has to be democratized. It cannot be centered around one particular job description really. And so we have a community across all of that. It's as wide as you'd like it to be and that community is public, so you can create your own ecosystem or own smaller community or a niche community that could serve your purposes in that sense, as well.

MR. SHELTON: So that's a really tangible example of how corporations can lean in to actually create the platforms and pathways for people to ramp into the new sector.

Representative Khanna, you've talked actually about how we rebuilt our systems at scale in order to be able to do that across the country. And why don't you talk about some of the things that you're proposing as solutions in this space? And I don't know what the pushback is, but it'd be great to understand what the pushback is, if there is any.

CONGRESSMAN KHANNA: Well, let's take an example with robotics processing and then I can talk more broadly. And you understand this far more, I'll try to provide my understanding.

Basically, you know, when you order let's say something online, a lot of the

chats that you engage in have been automated. And the software that's being discussed is what allows some of that automation for chat and automation of business processes.

Now, that's going to create a whole opportunity of industry of people who are going to be training and understand that technology, hat probably is not going to require a college education, it may not require, frankly, more than six to nine months of credentialing. But the opportunity in the window is probably the next few years. And what will happen if we don't seize that window as a country as those jobs are likely going to get offshored. They will get offshored to the same countries where so many tech jobs were offshored.

So there has to be an intentionality in our country of saying, okay, we understand that this is a sector, an area which is going to create a lot of jobs. Let's make sure that those jobs are distributed across the country. And let's have a collaboration, as Jim pointed out, between the government, between regional businesses, between community colleges, and the private sector to say, okay, what are we going to do to get people the credentials, to get these jobs, to make sure that this industry is in the United States.

Why have we not been historically focused on this? I would argue bluntly that for a long time we didn't have the same sense of urgency in this country. We were focused largely on consumer welfare as opposed to jobs, especially after the Cold War. We were the only game in town and we never really thought that we're going to have to think about good-paying jobs, but we no longer have that luxury. And in most other countries from the time someone's seven or eight they think about how am I going to get a good-paying job?

You know, both Jim and I served with President Obama, and I don't mean this as a partisan comment because I think it could continue in this administration, there was a program that Megan Smith started called TechHire that was designed to do exactly this; to think about, okay, what are the new industries? Where is the community? What can we do

to make sure that people are getting those skills?

And the reason the private sector is important and it has to be a holistic approach is I was down in -- I don't want to mention the community because I don't want to embarrass them, but there was a community college that was teaching folks how to replace hard drives. And I was thinking, okay, now you're wasting all this money in a community college that's not going to lead to a job and then you're going to get more people saying these job training programs don't work and we're wasting money and just this sense of dysfunction.

So you have to involve the private sector. You have to involve government and the regional communities to have a job at the end of the tunnel and be very intentional in the industry.

What could the government do? Let me suggest three things. I have no idea why this country can't get a commitment to have universal high-speed Internet in every part of America. Forty billion dollars, that's the amount of money we spend one year in Afghanistan. I challenge anyone to go around the country and say do you think it's more important for America's competitiveness in the 21st century for every part of this nation to have high-speed broadband or do you think we should stay one more year in Afghanistan? I mean, 18 years.

If you'll permit one digression. President Trump called President Carter and he said I'm concerned about China. They're getting ahead of us. And President Carter said, well, China hasn't been in a war since 1979. They're building high-speed rail. They're building broadband. Why aren't we investing in our country to build those opportunities? That would be one thing I would do.

The second thing I would is be intentional about federal software contracts. Make sure some of them have to be done 10 percent in rural America or in communities of color, so that you're incentivizing businesses to have metrics, metrics of hiring, and to help make sure that the distribution of these economic opportunities are more broad-based.

And the third thing that I would prioritize is massive investments in technology institutes, whether they're at the HBCUs or at land grant universities, to give resources, but that it collaborate with the private sector, so that communities can develop the basic credentialing and skills for the jobs of the future.

Why hasn't it been done? I don't know. Why has Congress not been able to do anything in the last -- you know? I mean, there's a gridlock in our political system that they're the biggest cost. I mean, you know, obviously there are a lot of things, in my view, this president has done that have immoral standing, like separating kids from their parents. But the biggest cost of our last few years has been inaction. We're paralyzed. And the challenge I fundamentally believe, as you do, that this country's great, extraordinary because of our values, but we are faced with a new type of competition, which is authoritarian capitalism. Not fascism, not communism, but authoritarian capitalism where a state with very little regard for civil liberties goes and says I want to just build something and they build it.

The challenge for America with our extraordinary multicultural makeup and with our extraordinary messiness of democracy, are we capable of actin with decisiveness to build the investments we need to deal with the technology revolution? The good news is, in the past, America's always risen to that challenge, but it's going to require a new generation to do that.

MR. SHELTON: Thanks.

MS. MEHTA: Can I add to his comments?

MR. SHELTON: Yeah.

MS. MEHTA: I absolutely agree with you. There was a stat that we had which said 4 percent of American jobs require a medium level of creativity. And so we must train society for the new jobs, for the jobs of the future, the jobs that are going to be in the next 20 years leading the world in everything. And so I absolutely agree, we need to train people on the newer technologies, on the newer methods, because that's how this is going

to play out. Really it is.

And again, coming back to automation, which is my world, you know, this is what we have seen in the last even five years. We have seen, you know, instances where a customer, for example, has brought out a cure for cancer three years earlier than they expected because of the automation. Or we work with an organization called PeopleShores that we just talked about, where we have retrained youth with limited opportunities to move from a low-income job or a minimum wage job to $100,000 job within about three to six months.

This is what we can bring to society with technology if it is done right, if it is done with communities, it if it done with government. And that has to be part of the equation because it has been tried and tested. Now it's time to take it to scale.

MR. SHELTON: Good deal. So I'm going to give you guys a second to start formulating your questions. I think I have like two minutes before I'm supposed to get there. Oh, excellent. Oh, great, now I get to ask my next question.

So the interesting thing is that the other Einstein quote which is often really misused is, "Imagination is more important than education." And the real context is that in order to solve problems that have never been solved before, you have to be able to envision a solution that doesn't exist.

But you all have both spent a lot of time talking about solving this problem through skills. You both talk about creativity in some form or fashion. I haven't heard anything about what that looks like in this context. And I don't know if you even have an idea of what it means to begin to think about how we actually develop people to be more creative problem solvers in these contexts. But I wonder if either of you actually have that in mind. Feel free to say no.

MS. MEHTA: I can share a few customers stories, if that helps you --

MR. SHELTON: That'd be great.

MS. MEHTA: -- where we learned from customers as to how -- again, we

are technologists from an automation point of view, right? So they come from their world and they tell us that just having gotten rid of the things that really don't add that value enables them to have time. Sometimes you just don't have the time to think outside the box or be creative. Because you have skillset, you know your subject, you know your industry that you're working in. You know it really well. And if you only had the time or the bandwidth really to kind of think outside the box, they bring that creativity. And that enables that creative outlet, you know, to come to that next level of whatever it is, whether it's even customer service or whether it is innovation.

Just the fact that you can have blood tests without errors being given. You know, it changes the game. And that's what automation can bring to it.

So I believe from a creative angle it is a direct match. The more you automate everything that can be automated, the more creative capacity you can unleash.

CONGRESSMAN KHANNA: I would say, Jim, obviously there are new industry, new skills we need to educate for, but some of this is a question of basic values and what our society is committed to doing. I was back home on Sunday in Fremont and I met with a group in Santa Clara, the Black Engineers Association. And they told me a statistic that I found startling. I think some of you may know this. Only 33 percent of black students in this country go to a high school that offers calculus as an option. Thirty-three percent. Think about that. That means 67 percent of black students, talking about the place you grow up, will never have the opportunity after high school to apply for most schools to get into a science or technology program because they don't even have the option of taking calculus.

Now, that doesn't require an understanding of new skills or new technologies. That's just a question of why in our society in a 21st century economy are we not making the commitment to have basic science and technology proficiency in every high school in this country? Right?

When you look at the income that you talked about and gaps. I mean, of

course some of it is new industry. Some of it is that there's been a decline in the national share of income. And the experts here know more, from about 58 percent that used to go to workers to 54 percent. And we have perpetuated an economic system that rewards investment in capital more than rewards investment in workforce. We haven't raised the minimum wage. We haven't helped unionization. We've provided tax incentives for depreciation instead of workforce investment.

So, yes, it's about new industries, but it's also thinking through the economic system that we have created and what that has meant for the accumulation of wealth for some and the decline of the middle class.

And then finally, yes, we ought to be investing in new industries and new credentialing. And, I mean, whether that's in synthetic biology or whether it's in photonics or whether it's in other forms of research, and making that distributed across the country, I think that's necessary for competitiveness and new industries. But we shouldn't think that that type of investment is going to solve some of the structural inequality given that we haven't done -- taken steps to solve the structural inequalities in the current industries.

MR. SHELTON: So, I mean, you create a great path for us to think about the layering of these kinds of interventions that we're going to need to have in order to make the transition. And also, you talked briefly about the things that we need to be able to help people prepare.

There already was in prior years an investment in connecting all of the high schools and, frankly, all the schools in the country to high-speed Internet. You talked about the investment for the rest of the communities and building these tech institutes. Have you put any thought into the connection among them in place?

You describe one opportunity where people have done that. Are there others where you're seeing institutions at the higher ed level and schools and employers really starting to crack the code on how you actually create these pathways?

CONGRESSMAN KHANNA: I think that's such a good point, Jim, because

my experience has been that it can't just be someone in Silicon Valley or someone in Washington making something work in a community. In fact, there was a heartbreaking story in *The New York Times* about a place in West Virginia, where a well-intentioned nonprofit went in to try to teach coal miners skills of coding and they got millions of dollars, you know, and it didn't work. And, of course, that's the story the press will write about. But, you know, it was because they didn't have enough local buy-in.

Contrast that with let's say Jefferson, Iowa, where you've had a local company, Pillar Technology, partnering with Des Moines Community College, partnering with the Governor's Office, getting certain resources from the local county. And there is a commitment there to having people learn basic software skills, live in this rural community, and get a $65,000 job after two years. But it was a concerted effort.

Now, they partnered with Silicon Valley, the Tech Museum went in for three days to help teach the -- or partner with the Des Moines Community College faculty about what the curriculum should be that'll be most conducive to 21st century thinking and 21st century jobs. But the initial sort of infrastructure had buy-in from all the local stakeholders.

And, you know, I had gone down to Jim Clyburn's district and you saw the same there with some of the HBCUs and local communities. And so I think that that point is so important, which is why I think TechHire, not to keep touting it, was such a good model because that was based on building this local partnership and infrastructure, and then fueling it with investment.

MR. SHELTON: Agreed. Now, just really quickly, Neeti, you talk about opening up the platforms, but are you seeing more deliberate efforts by people to take the tools that you provided and then build programs around them to actually prepare people for this economy?

MS. MEHTA: Absolutely. For example, there are universities and colleges that are using it. Then there are organizations, like PeopleShores, that basically will train youth without opportunity or train people who are looking for transitions, people of domestic

violence, et cetera. And they kind of set up these centers just to train and they train them, and then they get them jobs with other partners or customers looking for RPA, for example, RPA bot developers or bot creators as we call them. They might also add it to the bot store and actually monetize it, so that the nonprofit also has a regular source of income to continue that training. So we absolutely see it across the board.

And we see it across the world, not just in the U.S. And it's a great model because not just allowing people to take it. The nonprofit sector, the education sector, they are really good at what they do. And just by enabling them to take it to that next level, giving technology to them in their hands so that they can train and that they can then influence the next generation of work, is very, very important. And that is part of that societal movement, I think, and we have seen great success with it.

MR. SHELTON: Great. So as we transition to Q&A from you, one last question, which is we're grateful to Google.org for the investment that they've made. You've provided a great example. You're representing many of these technology companies. If you had one or two things that you'd say you'd like to see the broader technology community, corporate community, do to lean into this issue and problem, what would you say people ought to be doing?

CONGRESSMAN KHANNA: Well, they need to do more than one or two things. They have to --

MR. SHELTON: I'll give you three, go.

CONGRESSMAN KHANNA: They've got to recognize as the head of the spear of the technology revolution, they have an obligation to create greater equity. And so I would say three things. One, expand the imagination and where you're hiring from, and some of the companies rea doing that. They're making more conscious efforts to partner with HBCUs, to partner with state schools, to partner not just with the traditional universities to look at where to get talent.

Two, I would say really expand into communities, both into rural

communities and communities of color. And where you can hire people and provide a concrete examples of success. Where if it eliminates 20 people, 30 people in the community, that can change the entire aspiration of a community.

And then third I would say is make sure that you are a model in terms of paying your workers, both the people not just at your company, but the subcontractors, the janitorial workers, the food service workers, the building -- bus drivers a decent wage, decent benefits, so that people don't think that only -- the rewards of technology are only accruing to the very top.

MR. SHELTON: Got it. Neeti?

MS. MEHTA: I agree with everything that has been said. You know, corporations, apart from just building technology corporations and every vertical and every industry must kind of have a mindset to enable. And if you have that mindset to enable, then I think the sky's the limit. It's really imaginative in that sense, you know.

What can you do to bring this technology and make it more accessible, make whatever your services and products are more accessible to the community at large? And I think just having that consciousness and that plan of action around it, and being very specific about it, you know, these are the things that we will do immediately, these are the things that we will do in the next year and so forth versus just having a mindset to do it, but not taking steps immediately to stop that process I think it's important for corporations to look at.

MR. SHELTON: To actually get something done.

MS. MEHTA: You must. You have to.

MR. SHELTON: Okay, so this is the question-and-answer period. I will remind you there's like a question part to the question-and-answer part. I will apologize in advance if you don't do that.

Sir. That's you, yeah.

MR. MACRAE: Chris Macrae, Norman Macrae Foundation. So you talked

about exponentials. And obviously, one of the most famous exponentials of all is Moore's Law: doubling every 18 months, actually 100-fold every decade from 1970.

So my fellow economists actually wrote a survey on why isn't there a Silicon Valley everywhere back in 1980? And over the last 40 years what we have concluded is the logjam is an education. It's in the teachers. It's in the missing curriculum.

So what I'm wondering is, you know, actually you do the maths, we now have, by 2030, 1 trillion times more technology of the Moore's Law type than we had to race to the moon. How do we get a curriculum in the 2020s that even third grade students and teachers can map back from the future of all this technology you're talking about? Because otherwise, all these Brits and pieces really are not going to help Americans at all.

Singapore is already mapping such a curriculum, so that's one example. You know, how do we do something that's better than Singapore?

MR. SHELTON: You guys want me to take this one?

CONGRESSMAN KHANNA: Sure.

MS. MEHTA: Yeah.

MR. SHELTON: So my other passion is how do we actually get the kind of R&D and breakthrough R&D in education and in development that we actually need? So a couple of things.

One, some of the structural stuff. We don't invest in R&D in the education space the way we do in other sectors. We don't actually have the infrastructure in place. So just to put it into context, in the military and defense we invest roughly at the fair level $80 billion. We invest less than 2 if you're really, really generous at the federal level. so not putting the resources behind how you actually get real breakthroughs is a part of the problem.

The second thing is that we have successfully taken a world that is inherently interesting and figured out how to make it so reductionist that almost every student describes school as boring. Right? And so the question for us is, how do you

actually then enliven the curriculum around things that are relevant and actually allow for real problem-solving in the context of being able to teach them the confidences and skills that they need.

That's a design challenge and we've actually not been very good at putting it forward in a way that let's people be responsive to it, but that's also tied to the third challenge.

We still devalue teachers. And in order to have teachers that can teach a complex, problem-based curriculum, you have to have people who have high levels of competence themselves. And you have to provide them with tools and resources to make it work. We have actually not provided either. Like other than throwing it up on a screen, we basically still have teachers who have colored markers and pens. No other tools for actually understanding exactly what students know and don't know, being able to match it to content and supports.

Those things, when you ask for a teacher to do the basic work of teaching, think about it, an average elementary school classroom is about 35 students, so chop off the last two rows, that's basically it. I as a teacher in elementary school, I'm expected to come in and know what each and every one of you knows, what you don't know, what you're interested in, match it to the perfect content and instructional approach every day. Think about that task. Think about the cognitive load in that task. And then say what tool have I been given to help me do that? What tools have been given to help me do that?

Now, say I'm a secondary school teacher. That means I teach somewhere between 125 and 250 kids a day. Do you wonder why your kids' papers don't come back graded? So all of this is about how we do the work that Rebecca's been talking about, about how we create a real revolution innovation in the education and learning space that can actually help us keep up with the changing times and create opportunity for people who don't have it today. We got to do it cheap, too, by the way.

Go ahead.

MR. CHECCO: Thank you. Larry Checco, senior advisor to Serve USA. And I'm not a teacher and I can relate to exactly what you're saying. It's very frustrating for them.

But I'd like to posit the idea of a national service program to bridge some of these gaps. From kids from 18 to 26, who don't know what to do after they go to high school, to hook them up with private industry, to have them go through almost apprenticeship-type programs. Incentivize them. It's a two-year commitment. At the end they would get something similar to a G.I. Bill that would help them advance themselves. I think this is a real notion.

MR. SHELTON: That's a great idea. I think people are toying around with ideas like that. In fact, there's a pretty big initiative around apprenticeship that's moving nationally. You might want to connect with them.

Did I see another hand over here?

MR. CHECCO: Yeah, and I know that Brookings is going to do something on national service in October. Thank you.

MR. SHELTON: Fantastic, thanks. We'll go here and I saw a hand back there, then I'll come back up to you. Is that okay?

SPEAKER: Hi. Thanks for such an interesting start to the day. This has been really interesting to me. I'm from an organization called GSMA. Probably no one's ever heard of it, but we're the trading association for the mobile industry. But maybe more interesting for this discussion is on the foundation side we work with mobile operators all over the world to investigate how mobile technology can have a positive impact. So most of our work is on low-income countries, but we're now exploring how we can have the same transformational liberating impact in developed countries, including the U.S.

I've been really encouraged to hear the private sector mentioned a few times and my takeaways are that maybe there's an opportunity for mobile operators, so mobile phone companies in the U.S., and mobile technology to do a few things.

MR. SHELTON: Sorry, sir, do you have a question?

SPEAKER: Yeah, I'm getting to it, sorry.

MR. SHELTON: Okay, thanks.

SPEAKER: One is addressing connectivity in rural and urban areas, the other one is supporting digital skills and also just being good employers and making sure economic opportunities are available in rural communities, as well.

My question is, of the opportunities we talked about today, which one should we be telling mobile operators to focus on most urgently? And what kind of partnerships should be we be advising they put in place to make sure that impact is sustainable and meaningful? Sorry for the long intro, but I thought that might be helpful.

CONGRESSMAN KHANNA: Well, I would say expansion of hiring is probably the biggest thing that someone can do and having that be a pathway to a good job. And that's something concrete that mobile carriers or many tech companies can do.

MR. SHELTON: Do you want to add anything?

MS. MEHTA: Not really.

MR. SHELTON: Good deal. Back here.

MS. FITZPATRICK: Hi. My name is Christina Fitzpatrick. I'm with the AARP.

And there's been -- uniquely human skills are going to be really important in the future. Neeti, you mentioned creativity. Do you know of any programs that are effective at teaching those kinds of human skills and enhancing people's ability to be creative?

MS. MEHTA: I don't know of any programs offhand, I apologize, but we can come back to figuring that out, I guess. But I agree with what Jim said, it is about enabling our teachers to get to that next level. How do we teach creativity? And putting tools and time in their hands and really, you know, teaching our students for the next generation versus what we already know. So, no, I don't know of any offhand.

MR. SHELTON: There are some. An increasing number of evidence-based

programs around social, emotional, and integrated with academic development. One of the more important things to remember is that programs are not the main thing. It really is about the environments and the relationships that young people find themselves in that lead them to developing the skills to create other environments where they have human connection and can form relationships.

So it will not necessarily show up in the form of a program, but in the kinds of environments we create.

Here.

MR. ALLEN: Gene Allen. I have a company called Decision Incite.

The challenge is -- and I want to thank you guys for exceptional presentations -- how do we teach people to learn? Because by the time you learn something it's potentially out of date. And the challenge is teaching not just -- teaching everybody. It's teaching masses to learn quickly enough so that they're individually empowered. So you have to teach the teachers how to learn quickly to stay on top of the technologies and the tools that they're teaching with. So learning becomes really the work of the future.

MR. SHELTON: So you made a pretty powerful statement in that, which is learning is the work of the future. And so we have to first recognize that.

I don't know if you have something you want to say on this topic or I can keep going.

CONGRESSMAN KHANNA: I mean, I agree with you. There's a great book, *Start-Up of You*, by Reid Hoffman where he makes more less this point that you have to be a lifelong learner. You have to understand that you'll have many career changes. I mean, my father came to this country as an immigrant and had the same job for 30 years with the same company and then retired, and that's unlikely to be the path for most people.

And so inculcating that from a young age where people understand that it's not just, okay, you're done with school and then you're done with education, but that this is

something, this is an approach that's going to be necessary for success your entire life, and I think having that in the curriculum.

MS. MEHTA: Technology is already moving in that direction. So the newer technologies, including the ones we produce, the learning curve is two weeks to two months. And so then it's a question of, you know, wanting it, enabling it, making sure it's talked about, communicated, so that people have that opportunity. Newer technologies will take, hopefully, shorter time spans and shorter learning curves for people to on-board into it.

MR. SHELTON: So there's the part, also, about the mindsets, the behaviors, and the skills, right? And the mindsets that you need to be a continuous learner to be able to persist through difficulty and all of those good things are things that are currently underemphasized. Talked about a lot, but underemphasized in how you actually in practice help instill them in young people are they're growing and, frankly, restore them in adults who've had it beaten the heck out of them.

The second thing, though, is then that the ideas that go along and the skills that go along with actually seeking out new knowledge, being able to navigate systems to accumulate knowledge and find the resources that can be helpful, that also is a skillset. And we've not prepared people for needing to do that for the rest of their lives nor put them through systems where they have choice about what they actually learn.

And so I can't help but imagine that that kind of environment is going to be required in order to prepare people for what's coming in the future. I don't think any of us know exactly what it looks like, but I do think you're seeing more and more school models pop up where that kind of choice is built in. And more and more programs at the postsecondary level, where people are given the flexibility to begin to make choices along the way with support and guidance, and that that pathway then stays available to them for a long period of time, whether it's coming back to the same university or subscription programs, like a Pluralsight that's let you keep continuous learning, not to name a commercial provider, or others, as well.

Okay. I think we have time for two more and there's a question back here. Go.

MR. SAVAK: Thank you. My name's Anit Savak. Pleasure to be here.

I had a question on China and the comparison between the U.S. and China, given that China's --

MR. SHELTON: Can you take him the mic? We might, but the people on the Internet definitely can't.

MR. SAVAK: Let's try one more time. All right, there we go. I sound more manly. (Laughter)

I wanted to ask a question about the American model versus the Chinese model. As you look increasingly throughout the world, leaders in Africa and Asia and elsewhere are seeing the way China seems to have their act together on technology adoption, on upscaling for the future of work. And there's a perception in many parts of the world that we're falling behind. What can we do?

Given some of the gridlock that the congressman kind of mentioned, what can we do here in the U.S. to give hope and to provide an alternative model, to be that beacon of hope that we have in so many ways and for so much of our history? How do we maintain that as we look to this new threat that China's providing?

CONGRESSMAN KHANNA: I was with Condoleezza Rice back when she was at Stanford and she said, you know, if you want to make sure we stay ahead of the Chinese, then make sure we give any Chinese student who wants to come here and start businesses here a green card. Part of our advantage is our immigration. And the restriction on and climate of fear of immigration is, in my view, one of the biggest detriments to our competitiveness. How are we going to compete with 1.4 billion people if we're not a magnet for attracting talent?

We also need to mobilize science and technology much like we mobilized science and technology after Sputnik. Federal research in places like NIH, NSF, DARPA

have fallen to less than 1 percent of GDP where they were at one point at 3 percent of GDP. Why aren't we making those basic investments in science and technology to make sure we're ahead of the new industries?

Look, I think China has a lot of problems. I mean, obviously their human rights abuses, they're not nearly still as entrepreneurial as a culture. I think the rule of law is not as strong. I think we have 60 percent of the top universities. If we can just make sure that those of us in Congress don't get in the way, we should be fine.

MR. SHELTON: So yes to everything that was just said. (Laughter) The thing that I would add is that we also have to kind of challenge the narrative that the Chinese education system as it exists today is superior to at least what the best of our education system does, especially for the economy that's coming.

When you talk to folks that are in China or, frankly, in India today, what they talk about is the rote system that actually perpetuates through most of their system; that it's actually only a few students who actually get to participate in systems that allow them to begin to expand and become a part of the creative society. And it's also another reason that so many of the very, very top students wind up coming here, not just to stay, but because the quality of the education here.

What we have to do is figure out how we expand the best of what we have to all the rest of our students and how we create more incentives for our students to continue in the educational process, so that all of the folks who have the kind of expertise that you get at the doctorate level and are needed now in many cases for AI, machine learning, and some of the advancements that we need, where they actually have the incentives and the resources to stay in the game and pull from a much broader base of Americans than we do today. That's where we're going to get the innovation.

Okay, last question. Here.

MS. CHADSEY: Do I wait for a mic?

MR. SHELTON: Yes.

MS. CHADSEY: I am a teacher, so I follow directions. (Laughter) Okay, good morning. I'm Jane Chadsey and I lead a small nonprofit in Seattle, Washington, called Educurious for an ed tech company.

And I'm going to get back to something that you said right off the bat and that is technology's going to lead to a better society. So mine is a really big question about the intersection of technology and education. What does that society look like? If it's better, how is it different than it is today? And what role can education play in that?

MS. MEHTA: That's a loaded question.

MR. SHELTON: It's at least a big question. You've got like a minute and a half. (Laughter)

MS. MEHTA: I have a pretty big imagination, so for me, you know, I don't see 30 years ago what society was and what society is today. If you take anything from healthcare to banking to, you know, a person moving between cities or it can be anything, logistics, you know, government services, it doesn't matter, I think we have moved far, far away. If you could just take a point in time 30 years ago and you take a point in time today, society has advanced unbelievably.

Now, what technology is doing is that it's creating that exponential curve and growth. So between now and let's say 30 years from now, if you take two steps in time, two points in time, I think we'll have longer lifespans, less child deaths, less displacement when not needed. Hopefully, you know, we've fed the world, so to speak. We have education opportunities for everybody.

Just the fact that the Internet exists, look at what has happened to information, how much accessibility there has been to the society as a whole, and how much we learn because of that. You know, people who haven't been to school even have access to information, which they didn't before. At least they know they're not educated. They didn't even know they were actually behind in some ways because of that lack of communication.

MR. SHELTON: Neeti, I'm sorry, I want to interrupt you because I want to give you a chance to use this to kind of close out if there's anything else you want to say. And I'll the representative have another chance then.

MS. MEHTA: Absolutely. So I think it'll be a much, much better place, a happier, safer, and more socially connected place. And so I think that's what technology will bring to the world.

CONGRESSMAN KHANNA: Well, maybe I'll answer the same question to try to offer a close. Technology inherently is a moral. I mean, technology can help us in solving material needs and improving the human condition in medicine, in giving access to more information. But I think what this country needs is more thinkers, is more humanists, is more people with the judgment to shape the rules of how we're going to use the technology to be enhancing, to how we're going to make sure that different people have access to that technology, how we're going to understand how to find common ground despite different perspectives.

So, you know, it's really for more liberal arts thinking and teachers and humanists to help shape the world, and shape technology in a way that will be positive.

MR. SHELTON: And to close it out I will just tell the end of a story, which is for those who are familiar the two wolves that are fighting inside. And the answer of the one that will win is the one that you feed.

It's going to be up to us how technology is going to influence what kind of society we have. But to the congressman's point, we have to make some pretty bold and deliberate decisions quickly. And if we don't, it will happen to us, not with us.

Thank you, everyone. (Applause)

SESSION 2

MS. ESCOBARI: Thank you for coming back from break. You can never take those things for granted. I can tell you're an education crowd, everybody's quiet, never had this experience.

Anyway so what we hope we can talk about today and what motivates the work that we're going to talk about in the next hour or so, is very much the theme that we've been hearing all this morning with Jim and our panelists. Which is how is it that growth and business dynamism can translate in people's ability to get ahead. Because this EPOS, that if you work hard you get ahead, is very ingrained in the American psyche, probably comes from, you know, centuries of the immigrant experience.

But the truth is that today that's not the reality for many Americans. In today's economy you can work hard and you can still make $9.00 an hour and have to hold three jobs and have a hard time making ends meet. So why is it that we have an increase in financial precariousness at a time where we've had 10 years of economic growth? And in part I think this also fuels the growing divisiveness that we see in our political system. That many Americans are wondering why the system is not working for them.

So this is what I want us to talk about today, about and, you know, we'll spend some time trying to understand what are the forces facing American workers, and more importantly, what can we do about it. How can we think about growth differently?

So talking about the forces. By many accounts, we've been having a very long expansion. Actually next month when the job numbers come up this will have been the longest expansion in seven decades, or since we started to track business cycles. Unemployment is under four percent, and has been for a while, which is another historic low. But this is not translating again in people's ability to lead a better life. And there are a lot of reasons for this.

One of them is this. Is that there has been a decoupling of growth and productivity. So basically as we've seen growth and productivity grow, it hasn't translated in more jobs or better jobs. And in part, this has a lot of explanations, but in part it's this, you know, winner take all economic model that we see around software that is more and more dominating our economy.

I mean before if you wanted to sell more widgets, you know, you had to

build more stores and hire more people. And now if you want -- many of the products and goods that we consume are digital, which means they can be distributed at zero marginal cost, you know, to millions of people. And this has in part led to returns accruing disproportionately to capital over labor.

And as Neeti described, so we'd have this bifurcation, but a bunch of other things happening. Decreased wages, fewer people working for shorter spells, increase in the disability regs, lower mobility, less new firm formation. And automation, which is something that Neeti described, is revolutionizing our productive systems, right? From the assembly line to customer service. But it's also having this effect on jobs, this bifurcation of the labor market where middle skill jobs, and this is work by David Autor at MIT, for the last 40 years has been going down. And it's become harder for people from these jobs to transition to the high-skill jobs. And the jobs at the bottom are basically, are becoming crappier. And that's a technical term. Lower wages, more unreliable hours, less benefits.

And this is affecting people's ability to stay in the workforce. And one of the, I think, scariest facts that we've seen is that people are dropping out of the workforce. And this is a trend, again, that has been going on for the last 40 years.

Right now if you think of all men, 11 percent of men are not in the workforce. And that is coming down from a low of three percent in the 1960s. And if you think about workers with less than a BA, that number become one out of four men are not in the workforce. And this is a population of, you know, 28 million people.

And also salaries have stagnated. They've recently, you know, recovered, but for the last 40 years salaries have gone down. For men at 28 percent, for men without a college degree or who have not finished high school, 66 percent. And there's a lot of reasons, and some things that we don't understand of why wage has stagnated. But in part we know there's been an increase in monopoly power.

We have seen in the last 10 years more concentration in 70 percent of industries in the US. The demise of unions, practices like non-competes and non-poaching

agreements that have proliferated at the low end for hourly workers. And just in general workers at the bottom having less agency, less ability to move between jobs or negotiate higher salaries.

And this is having its effects, which we have talked about and is, you know, widely studied here in Brookings, which is that the middle class, which is the engine behind sustained economic growth, is shrinking. In 229 of the largest metros, the middle class is shrinking in 203 of those metros. And companies, driven by margin pressures and competition, and more efficient platforms, are also able to compartmentalize work and more easily contract it away. And contract work means, you know, all kinds of flexibility and savings for people, but also for a large proportion of the population, which McKenzie calls the reluctants, it also has meant, who need to do this out of necessity, has also meant, you know, less benefits. These are workers that now have to think about their own upward trajectory, that need to understand what the skills of the future are going to bring. And by many accounts, this today makes 35 percent of the American workers. Thirty-five percent of the American workers engages in contract work. And this is something that we have yet to see the economic consequences of this is these people who are, again, do not have the kind of traditional benefits that took, you know, the last 100 years, to associate with work and their lack of savings.

And at a time where there is a premium of skills, and this is research from Mark Marrow at the Metro Program, that shows that digital skills are becoming more important at every level of job category. So at a time that this is happening, corporate training is going down.

And lastly, mobility. So at a time where we have wage stagnation and a bifurcation of the labor market, the institutions that were beacons of mobility, college, education, health care, child care, housing. All of these things are becoming not only more expensive but also less able to deliver on that mobility.

This is a graph, again by the research of Raj Chetty, that shows that your

access to college, and also your access to good quality college, is almost 100 percent determined by your parental income.

So I think my goal was not necessarily to depress you, but I think I have accomplished that. And it's not even, you know, lunchtime. But what we want to talk about is how do we think about the solution space. And this is how we are trying to organize the three buckets where we think we should be thinking about in terms of what we can do in confronting the challenges of future work.

One is growth. And that's the demand site. We need to, you know, grow and create better jobs. I think growth is the key for creating opportunity. Although how you grow matters, and we'll be talking about that.

The second piece is people. Helping people transition to those jobs, particularly low wage workers who are being the ones left behind. And this is work that you're going to hear later this afternoon.

And third, we need to not only reinforce, but at times kind of reimagine the institutions that are responsible for bringing mobility. These are housing, schooling, transport, etcetera, so that peoples' hard work can actually translate into a better life.

Now these three are inexorably linked, and that if we just focus on the supply side, you know, we'll have PhDs driving Uber taxis. But if we also only focus on the growth part, eventually what we'll see is what we're seeing now, people not being able to transition to those opportunities, and dropping out of the workforce, and eventually the most competitive firms not settling here.

So I think the timing right now is actually quite propitious for us working in bolder ways around these three areas. We have a tight labor market, which means, and we've already started to see some recuperation from people coming back into the labor force, wages moving up. So there's a pressure for companies to think differently around how are they going to get the talent that they need, but also to deal with the social consequences of an equal growth that we have been seeing.

So I now want to take you to a slightly different world. I want you to kind of go up with me outside of the US to the world. Because we're going to talk about this first quadrant that's kind of where the research that we're presenting today is focused on. But I want us to go back to the world, and then we're going to come back to the US.

So I spent almost a decade at the Center for International Development at Harvard. And there we were trying to understand how countries grew. How did you get countries out of poverty traps? And this question about how growth happens is at the crux of what we're hoping to share with you today.

And what we realize when we think about just growth, is that growth actually didn't characterize humanity for the longest time. And this is work by Madison, if you stretch that to year zero to 1800, no country grew, it's a straight line. And then in the last 200 years we had a massive acceleration. And when that acceleration happened, cultures like the US and Japan accelerated tremendous in growth. The US grew 25 times in the last 200 years. And some countries got left behind.

And our traditional models that try to explain why did this happen are actually ill equipped in explaining the variations of growth. We've had, you know, the neoclassical kind of growth model that says well if you just accumulate these things, more land, more labor, more capital, more human capital, more schooling, you're going to grow. Well we know that this has not explained variation in growth.

You know we've also had lots of great advice, usually coming from this town, you know, the Washington consensus, which are all free advice for countries of stabilize, privatize, liberalize, and you're going to grow. Well many countries did that, all good advice, many did not grow.

So the work that Ricardo Hausmann and others did at the growth lab at Harvard was trying to explain growth from a different perspective. And they used, you know, big data and analytics to pose that the reason countries grew is because they learned how to make new and better things. And so not just more of the same, new and better products

and services. And they actually were able to measure the diversity and the complexity of a country's industrial base, and gave that number of that metric a name of economic complexity.

And they saw that economic complexity, what you're able to make, not only is correlated with growth, but is predictive of future growth. And this measure of economic complexity, by country, actually was 10 times better in predicting economic growth than the World Economic Forum indicators, and between business indicators, that governance indicators, schooling indicators. And not because these are not important things for countries to have, but because they are embedded in what you're able to produce and make.

So the question is, why haven't countries grown? Now I've told you the secret, you know, of growth, that you need to make more and more diverse products. And the way that you make more and more diverse products is by building capabilities, right? And capabilities come in many forms. There are the talent and specialized knowledge that you need to make new products, there are efficient roads and, you know, rule of law and logistics and good customs. And all these capabilities are necessary. And if I told you okay, you're just accumulating capabilities and you make a diverse set of products, you should be able to grow. But there are many places that have been left behind, right?

Why is it if I just told you the secret of growth that we still have poverty in American cities, around the world? And it's because this process of growth and building capabilities for growth has a chicken and egg problem. And that's the chicken in the picture here.

Let me give you an example. I'm originally from Bolivia, right? Why would I become a biotech engineer in Bolivia if there is no biotech industry? And how would a biotech industry ever evolve in Bolivia if I didn't become a biotech engineer and a hundred of my best friends. And even if we did, there'd be a hundred other capabilities that we need in that place for that industry to thrive.

So growth has this chicken and egg problem. Right? Which has countries stuck, and places stuck. And the question is now how do you get out of this chicken and egg dilemma? Because the world has evolved, the world has diversified, and the way that it has diversified is by moving to nearby products. You're like well what the hell is nearby means? And nearby means products that share capabilities, right? So if you have a certain set of capabilities and you're able to make shirts for men, what is it that you need to add to make shirts for women? Right? You kind of use a lot of the capabilities and you add a little bit. And the world has evolved this way.

And what the team at Harvard was able to do was to try to measure exactly this distance. And this is how they did it. And this not a Pollock painting, this is actually just a lot of data. And what it is is 1,000 products, each circle is a product, and in 128 countries, and 65 years of trade data. And what this has done, just using new tools, same old data, but using new tools to organize it, is that the way that this network is built is done so that if a country, if products are likely to be produced by the same country, these products are close together.

So this green cluster over here is garments. So if, you know, one of those circles is shirts for men, the other one is shirts for women. And in the way that the world has evolved, these tend to be produced by the same place, that cluster is together. If countries that make shirts for men are not likely to make microwaves, that's far apart. And every dot here, so the light blue are the microwaves and the ovens and the microchips. The dark colors in the middle are machinery, the purple is chemicals. And this actually explains why places get left behind, in that not all industries share capabilities with other industries that would make the process of growth faster.

So many of the poor countries and poor places are stuck in industry sometimes in their peripheries, whose capabilities to make that product are not easily redeployed to others.

So up there, that big circle on top is oil. It's a very sophisticated industry. It

actually requires very sophisticated capabilities, but is not shared by other industries that could use that to diversify, and countries get stuck there.

So using this map, we were able to answer a few questions, which not only how fast you're going to grow, but also based on what you make today, I can tell you what you're likely to make tomorrow. And some industries, again, are more interesting than others. So with this data we were able to show which countries are likely to grow and with what speed. In our project here at Brookings we were able to replicate the analysis to do the same for the US. So we have measured the complexity of 917 metropolitan and micropolitan areas in the US and mapped 285 industries.

And similarly with this we can predict growth, which I think is interesting but not really the question that we're here to answer, right? What we did is, again, created two networks because we have the availability of data.

One that does the same as the products base created at Harvard, that maps industries by the probability of co-location. But we also created another network which maps industries by the occupations that they share. Because we think that, you know, just like certain products are going to require similar capabilities like, you know, selling asparagus or, you know, flowers will require, you know, a cold storage transport chain. If Amazon is, you know, successful in Seattle and has to hire, you know, 60 percent computer scientists, then other industries that use that kind of labor are likely to co-locate. And this is what we see.

And we have used these two networks to be able to predict more effectively the kind of rise and decline of industries. Which again, we can tell you what is likely to appear, what industries are more attractive in terms of the capabilities that are shared by other complex industries, and which ones share complementary inputs. So this is the kind of insights that we're hoping to provide cities as they navigate this question of growth.

So these are two metrics that we're able to show from that analysis that I just showed you. So what is this? So these are two cities, South Bend -- so ever node is an industry. And these are industries that are present in that city but are not there with

strength.

The green is South Bend and the blue is Nashville. And based on the network analysis we can tell you which industries are more feasible or less feasible based on your current structure. And then which industries are more strategic. Which means not only which ones are more complex but which ones, if you were able to have that industry develop in your city, that it would be able to build the capabilities that would be used by other complex industries.

So in an ideal world, because you can't have any, you know, outgo without a two by two matrix, you would be in the upper right. There's nothing in the upper right. And this shows why it is hard to grow. But what we see with South Bend, a small city that has struggled after the demise of its manufacturing industry, is that most of the complex and strategic things for the South Bend are not close, are not feasible. So it is going to have to chart a path of consolidating what it has and moving up this complexity and strategic track.

Nashville on the other hand, the city has been thriving, and is probably one with the highest propensity of growth, has a bunch of industries that are feasible but what it has to decide in using its SARS tax dollars, where to invest it in terms of what capabilities to build for what industries. It should choose the ones that are more strategic versus those lower down.

And what we hope is to provide this map that allows cities to think about their growth differently and be purposeful as to what industries they attract.

So let's use an example of putting this kind of insights to work and how a city might use this. So let's talk about Boise, Idaho. Which is a city in Idaho which is the fastest growing State in the nation. Boise, last year, was one of the top five fastest growing cities in our country. And Boise has a fascinating story, and we're going to hear about it in the panel. But in a way, a very sophisticated tech cluster started there, which was an unlikely place 50 years ago.

It actually started with HP, which set up shop there and created a bunch of

capabilities that then other very sophisticated industries that were growing at the time were able to use, from attracting quality talent to building the infrastructure. And other industries, for example, like Simplot, which was making the, you know, potato chips that McDonald's uses, was starting to enter into advance manufacturing using technology. Most of these firms worked together to build a set of very sophisticated capabilities that brought about the engine of this quite sophisticated growth.

But what has happened in the last 10 years, which is what we show you here, is that that growth has not been maintained, and the quality of that growth. And that despite Boise having grown at 10 percent in job growth in the last 10 years, all of that growth has been on the low end, or most of that growth. So all the industries on the left here are hospitality, entertainment, you know, ag, are all below the median wage in Boise.

And when you look at the salaries, which are these two bubbles, which show the difference between salaries in 2007 and 2017. Salaries have stayed low.

So when you're thinking about Boise and trying to understand, okay, how could I think, how could I turn this around to make sure that the growth that comes next is not bringing me more poverty and more inequality, which is the current situation as we've seen median wages decrease six percent and, you know, almost half of the workforce, low end workforce in Boise.

So these are the kind of tools that we hope to make available, and we hope that cities are able to use. And this is an example of the kind of things that we want to be able to say okay, what is likely to appear and is close to you, what is likely to disappear, and also provide insights for companies that are trying to enter different cities.

So this is an example of Boise where we want to understand, you know, this feasibility, which are the industries that are likely to appear. We want to, again, we're able to look at all industries from how complex they are or how strategic they are. We usually, when we're thinking about industries we want to attract, we want to look at tradable industries. Because it is tradable industries that actually create the jobs. For every job in the tradable

industry, 2.5 other jobs get created in terms of, you know, restaurants and coffee shops and whatnot.

So here we can see, for example, all right, if we have similar feasibility, this industry of beverage manufacturing, which actually uses a lot of complex capabilities, is more attractive, interesting, and strategic than general purpose machinery. And then maybe if we look at other industries, like, oh, this looks very big and has a lot of jobs, travel accommodation, right? But does it have the jobs that we want? What happens if we think about providing good jobs for people with BAs? That circle shrinks, right? So it becomes a less interesting industry. And same if we look at what is going to provide good jobs for people who don't have a BA, which is, you know, the majority of people in Boise. But then, basic chemical manufacturing becomes more interesting.

So this is the kind of data that we're hoping to show. But it also, aside from playing offence, it can also be helpful in playing defense, right? In that here we have the probability of disappearance of industries. And what we can see is a little bit of what we've talked about before, that the technology industries that brought the growth in Boise are the ones that are most a threat in disappearing. And this is something that we saw on the ground. HP is a shadow of its old self, it employs one-fourth of the employees it once did. Micron, which is another great microprocessor company that started in Boise, is now expanding everywhere but Boise. And many of the industries that have the companies, the technology industry, are having trouble finding the talent to continue to grow.

But so it gives you a sense of what are the kind of industries that you should protect and create more density and bring more industries to create them to make sure that the right capabilities evolve.

And this is one last example on this idea of disappearance. Which is South Bend. South Bend, as you know, went for a massive decline through the last decades, but in the last 10 years has started to build resilience in the manufacturing industry. So if we look at manufacturing and we look at the vulnerability of this industry through time, from

2002 to 2017, you see that they all moved to the left. Which means that they have become less likely to disappear. And then I think I'll do it again because it's nice to see bubbles move.

And this is the last thing that I hope to show you. Which is we're hoping that this is something that companies are able to use when they think about where to locate. Because just like we can tell cities, we can also think, when we think of an industry, say what are the places that have the capabilities to be able to make you successful? And so that these choices and these conversations with governments and cities are ones that happen through capabilities and not necessarily tax incentive.

So what this shows us is that if you're in dairy product manufacturing, Lancaster, Pennsylvania, Spokane, are very interesting places. And also what we saw, for example, we know that Chobani, the yogurt manufacturer, set up shop in 2012 in Twin Falls, right next to Boise. And it has made a $750 million investment in that plant. So it's not surprising that Boise appears there as having the capabilities to be able to host this industry because it's nearby.

So to conclude, I think if there are two things that I'd love for you to take away from this work, and it's kind of where we want to go with this work, is that one size does not fit all. So each city, each community, needs to start to chart, thinks of charting its own path towards growth. It needs to understand its own strength, its possibilities, the needs of its people, and our work is trying to influence that. And if there are any insights that we think are city specific, then the answer would be different, the data and the analysis exists to be able to inform those choices.

And secondly, I think this is a message for companies too, that if they're deciding where to locate and where they can grow, that they do so and think about in this language of capabilities, that they work with city officials, but with other companies on how to build those set of capabilities that again, unlike tax incentives, may not make them more profitable but in the end will make them more productive. And also will make sure that the

cities that they live in become more prosperous for all.

So with that, I actually want to bring up to the stage companies that I hope, you know, we can have a conversation about this, because they're doing exactly that. And I want to invite Camille Busette, who will be our moderator. She's a Senior Fellow and Director of the Race, Prosperity, and Inclusion Initiative.

So thank you.

MS. BUSETTE: So while everybody is getting mic'd up I want us to give Marcela a really warm hand of applause for her excellent presentation.

So this particular session is building off of her presentation. And the question we're asking here is how do you build a workforce so that you can actually accomplish a kind of growth that you have outlined in your presentation?

So what we're going to do here, the format for this particular panel, is I'm going to introduce our excellent panelists, I'm going to ask them to provide a rather brief description of the kinds of work that they have done to incentivize workforce development in their particular locations. And then I have a couple of questions for them and for Marcela. And then we're going to open it up for questions and answers from all of you.

So let me start off by introducing my panelists. Sitting next to me is Bill Avey. He's the General Manager and Global Head for, what's PS Services?

MR. AVEY: Personal Systems Services.

MS. BUSETTE: Personal Systems, okay. PC business for HP, Incorporated, based in Boise.

Thomas Seewoester, who is the Vice President of Site Operations for Amgen, Rhode Island.

And sitting next to him is Scott Jensen, Director of the Department of Labor and Training for Rhode Island.

And then of course Marcela.

So I want to start off by first welcoming you all. And I encourage you all to

take a look at their very impressive bios which are part of the general packet for this event.

I'm going to start off with you, Bill. Marcela talked a lot about Boise and some of the sort of pattern of growth there which was high growth at first and then we seemed to have plateaued and there appear to be some clouds on the horizon. HP's been there a really long time. Tell me a little bit about how HP has, first of all, decided to try to grow talent in that area. What are some of the precepts around that? And then what have been some of the results, what you were thinking about as you were moving into a more challenging future.

MR. AVEY: So HP entered Boise in 1972. Was the first technology firm to come to Boise, Idaho. Boise actually was a very successful corporate headquarter city before that. Albertson's started there, Morrison Knudsen, who you may not have heard of, but they did little projects like Hoover Dam, and Wake Island was out of Boise, Idaho.

You have J.R. Simplot, who invented the flash frozen French fry during World War II, to sell to the troops.

MS. BUSETTE: Critical.

MR. AVEY: And more critically, he then sold it to the crops for McDonald's and, you know, made more money than the crops did by selling them French fries. Actually they ended up making about million dollar investment in a little company that became Micron Computers, coming out of that.

But HP was the first technology company there. And it began to create this nexus of other companies that built off that, and Micron would be an example. And, you know, Marcela was showing the dots earlier, and I had sent her a graph where we have something very similar for Boise where you can see this kind of nexus of HP, Boise State, later Micron Computers, created this real growth pattern. And throughout the 80s, 90s, and into the 2000s we grew rather rapidly.

Now a lot of that technology back then wasn't necessarily technology of how we think about it now. It was certainly R&D and knowledge workers, but it was also a lot of

manufacturing. And over the years those manufacturing roles moved elsewhere. But the knowledge workers and R&D intensified. But along with that, our education system didn't keep up. And so we're not able to educate the number of people we need in Idaho in order to fully staff not just our company, but all the other companies that have emerged in Idaho since that time. And so we've had to attract labor from outside.

So we now, and we'll talk about this a little more, but we now put a lot of effort in working with other community leaders, other businesses, and the State and the Legislature on approving outcomes for education in the State of Idaho.

MS. BUSETTE: Great. Excellent. Thank you very much. Thomas. Much the same question for you. Welcome.

MR. SEEWOESTER: Thanks again for the invitation, really appreciate being in front of you today. And most of you known an HP product, you have seen it, you know the logo. Some of you might not know an Amgen product. If you have an Amgen product in your hand, you are severely sick.

Amgen is a pioneer in the biotech industry. We were founded in '98, and we have a very clear mission to serve patients. We operate in six therapeutic areas.

And I think to your question there are two reasons why you join Amgen first and then why you stay with Amgen, right? And maybe I want to reflect on that a little bit. Most people are attracted to Amgen because of our mission. We work in an industry where at the end of the day you come back and you made a difference in peoples' lives. And often it's people who are very close to us, and you have helped them to go through a cancer therapy, overcome cholesterol and all of those, right?

I was attracted because of the mission but also because it's one of the companies that does the coolest science in the world. We generate on one day as much scientific data as a small company in a year. The company is founded on the very strong belief of values, and these are behavioral values.

And now I come to the second part of why people stay with Amgen for more

than a decade or longer. And this is because of the people that you interact with every day. These behavioral values, they have ingrained. One of them for instance is teamwork, trust and respect others, compete intensely and win. This has created a family that you will not find anywhere else so quickly. So that's kind of why people stay with Amgen.

But what are we doing to your key question of really helping them to develop over a decade, or meaning our 20 years and more in the company. I'm 18 years with the company.

We have two separate sets of goals. One is a goal that is an annual goal that measures what you deliver and how you deliver against these values, these behavioral values. And then there's another set of goals that is called the Career Development Plan.

This is where we take a very personal view into your career and ask you to plan for the next three, five, or 10 years your career life. On multiple pathways we provide mentors from the company, external mentors as well. So we really make your kind of life and work at Amgen kind of really exciting for you for your entire career.

I'm really excited, I'm a product of that. I've moved around with the company, and we're a little bit more about mobility. I distinguish between geographic mobility. Some of us, sometimes in our lives you're graphically mobile to a lot of places or a few places. What you should always stay is functionally mobile. Stay a continuous learner, that allows you to really shape your own career to your fullest satisfaction. That's why some people stay with Amgen.

MS. BUSETTE: That's excellent. Thank you. Scott, so you're based in Rhode Island. And Rhode Island, when people think of Rhode Island they don't think of it as they are the hub, for instance of the biotech industry, but you obviously have been able to attract some real giants. Can you talk a little bit about how the State of Rhode Island is thinking about workforce planning, how they attract companies, particularly in this northeast corridor which have already some strength in biotech and bio pharmaceuticals?

MR. JENSEN: Sure. Well, again, like everybody else, it's great to be here.

But I'd point out that while the size of a county, in most states, Rhode Island was the place where the industrial revolution was born in the United States.

A lot of fabrics were manufactured in Rhode Island. When Governor Raimondo was elected four, four and a half years ago now, she made her first, second, and third priorities economic development and workforce development. Because Rhode Island's economy had gone to become the costume jewelry manufacturer for the world. And that's all gone. And it left in about, you know, for the last 20 years it just drip, drip, drip. And we needed to change. And we needed to do exactly what you are describing, which is find our strengths and really build on them.

So I run the Labor Department, and what that means for Rhode Island, in the Governor's eyes for sure, is a program we started called Real Jobs Rhode Island. Which is a grant program. It is a sector-based workforce development program. And in that way it's, you know, sort of a typical best practice. But the difference is we are trying to take that approach to scale in Rhode Island.

And what that means is we're in the business of trying to create workforce solutions for our companies. That if you need something, we will try to find it, that is our job to make that happen. That means kind of perspicuous investment. So it's not good enough to draw up new curriculum at the community college. It's that plus let's make a recruiting capacity that can reach into communities much better and find people who might be very talented but would maybe get missed.

And then sort of the third thing is to make sure that the government bureaucracy remains my problem, my staff's problem, and not Thomas' problem.

So between those three things, the idea is to really put talented Rhode Islanders in the game in a much more efficient and effective way than anybody else. So that's the Governor's vision.

MS. BUSETTE: Great. Thank you very much.

MR. JENSEN: Sure.

MS. BUSETTE: Marcela, so, you know, we have two companies here in obviously the State of Rhode Island, which has really been in the forefront of trying to figure out how to continue to develop a workforce for the 21st Century and how to attract folks to their either companies or location.

What have you seen in your research, what have you seen work well, particularly for workforce development? And here I'm thinking about the potential partnerships between governments and companies. Have you seen anything there that you think would be helpful to informing this conversation?

MS. ESCBARI: Now the second question, I think we have great examples here, and I think later today we're also going to talk to Stephen, who was in part responsible for bringing Amazon to Virginia, who has a great example and how it was a workforce play and focus.

I think the concept that I'd like to introduce as we think about these solutions is kind of this specificity of knowledge. Like as we're thinking about, you know, how do places are able to make more complex things, right, you're going to need the base of education that we're going to talk about in the afternoon.

But the specificity of knowledge that you need to do the products that we were talking about, any of these, really is best acquired inside of the companies, right? The whole post-secondary infrastructure needs to help and create those general and specific skills. But the more companies are able to participate in the process of providing those specific skills, the better people and the productivity of companies is going to be.

And I think the more that conversation between cities and companies becomes specific, not just in talent, but a whole set of capabilities, the better the outcome. And right now what I see is sometimes that, you know, as many businesses gather together in different industry associations and Chambers of Commerce. But when the Chamber of Commerce has to advocate for industry, what's the only one thing that will be the same for a warehouse as to an Amgen? It's like tax incentives, right? Or tax reduction. So the more

we have less intermediaries for places in companies to understand about those specific needs, the more productive those conversations become.

MS. BUSETTE: Excellent. Thank you very much. So I have a couple of questions for each of you. And I want to start off with you, Scott, actually. So there are many elements to attracting talent and, you know, one could safely say that without some very significant government strategy and planning Rhode Island might have been left behind, right?

So tell me a little bit about some of the challenges that Rhode Island has faced. You alluded to those a little bit. And how it is you see combination of different strands of policy working together? So for instance when you're thinking about workforce you're thinking about housing, you're also thinking about education. You're obviously thinking about how it is you attract companies to your area or keep them there, right? So tell us a little bit about that.

MR. JENSEN: Well, you know, I think the way we approach it in Rhode Island is we really try to run things through, we try to focus what we're doing through the lens of demand. And that's different than having a demand informed conversation or something like that.

If I can talk with a company and I can find out that they need a finite number of definite individuals, I can reverse engineer and, you know, where am I going to get those people? And do those people need childcare, and what is their housing situation. So I think if you look at a typical workforce investment in the United States, maybe $5,500 a person, and that seems reasonable. But it isn't reasonable if it doesn't work.

So if you invest $10,000 in a person and that person is successful in getting a great position in Amgen, for instance, your return investment is much greater and, you know, you can stand up in public and say "Yes, I invested twice as much money, and it worked."

So, you know, I think that's the biggest challenge. We need to think a little

bit differently about the kind of investments we need to make and the kind of story we need to tell people, the taxpayers who are making these investments. And, you know, I think if you can really focus on the results and think of it like a workforce solution, the main obstacle is overcome.

MS. BUSETTE: So let me ask you a follow up question on that. You know, I think you have a success story, obviously, and you can point to successes. But if you're thinking about other localities where they haven't enjoyed that success and now they're thinking about, you know, potentially making a more significant investment, what are some of the guidelines and suggestions you would provide?

MR. JENSEN: Again, I mean I think the first thing that you really need to do is sit down and have a very detailed conversation with the companies that make up the strength of the economy you're trying to work in.

First, of course, for all of the reasons I've just said, but also they're great advocates. They are connected to the local Chambers of Commerce. Many of our real job partnerships are run by trade associations. So you are building a constituency at the same time. And when you're able to marry, you know, a business constituency because you're actually going to be able to provide value, with, you know, we all want to do good, we want to see our neighbors thrive. And when you're able to marry those two constituencies, you usually can really make an impact to get some different things done that normally would be impossible.

MS. BUSETTE: Great. Thank you very much. So, Thomas, I'm going to move to you and let's talk a little bit about Amgen. You mentioned to me in the other room that you're expanding, Amgen is expanding in Rhode Island. So that's always a good sign, right?

So tell me a little bit about why it is you're expanding in the following sense. So what is it about the workforce that signals that expansion is a good idea for you in Rhode Island? And then secondly, what has been the role of Amgen's relationship with government

in the process, the thought process at Amgen headquarters about expanding in Rhode Island?

MR. SEEWOESTER: So maybe I go back a little bit in time. Amgen moved into Rhode Island in 2001 when we acquired an existing site from a competitor for the forming of a product called Ambrym. And at that point we built the site out with a new facility, very large, became one of the largest drug substance manufacturing plants in the United States for a while.

We had a large hiring wave, hired about 1,800 people to the site. And because I explained to you earlier, people loved to stay with the company. We really didn't have a talent problem for a good decade. And about two years ago the company saw an increased demand and decided we need to build additional plant capacity.

We looked at the entire world, we ultimately ended up in Rhode Island out of a multitude of reasons, one being the location needed to fit into our global footprint strategy here. Because the material that I make is only three stages away from the final product so it needs to be shipped across the world so certain locations are more advantage than others.

One big reason was access to talent. And the Rhode Island location and the Boston/New York corridor gives you access to talent, particular manufacturing talent. And Scott was alluding to the history or Rhode Island is deeply, deeply ingrained in manufacturing jobs.

And one of the third reasons was we needed to make sure that when we built the plant, it gets also license with a high probability of success. And that is sometimes difficult if you choose a completely new location where you are not present in. And the Rhode Island plant enjoys an extremely high reputation with all regulatory agencies in the world. So that was the three reasons kind of that we ended up in kind of Rhode Island here.

The challenges we faced really as it relates to talent. A story of kind of two chapters. The first chapter is based on the new planning, we are hiring about 150 or more middle-class or high middle-class jobs, so there's a short-term need. But then we are also

facing over the next years a retirement and generation change.

So I know Scott loves to run, right, you love to run, right? So I use a track and field kind of analogy here. Our strategy is a little bit like we are moving from a middle-distance race, hiring these 150 people or more immediately into a marathon. And that is kind of how we look at the strategy and what we have to develop.

And this is really where Scott and the team really came together. Often Rhode Island has a lot of disadvantages of being small. I think being the smallest state I've seen helps to really foster a very strong teamwork among every stakeholder in the state here. We see each other on many, many occasions, different venues, different teams here. And I think in just the three years I'm on the site I've seen the strategy taking shape here between all stakeholders, government, schools, universities, colleges, companies, that we are interested in sustainable growth of talent, creating jobs, and ultimately growing the economy in the State, right? And we're all speaking the same language as we come together, and I think it really takes off and has created momentum.

MS. BUSETTE: Thank you very much. I'm going to give you a slightly different question.

MR AVEY: Uh-oh.

MS. BUSETTE: And so I know based on the conversations we've had, you know, prior to the actual session, that you can share with us an interesting example of how important it is to understand and shape the social environment within which your, you know, organization is situated. And this is especially important if you want to attract diverse and global talent.

So tell us a little bit about some of the social factors in the community in Boise that can make it easier or more difficult to attract a diverse and global workforce, and how has HP addressed those factors.

MR. AVEY: Yeah. So let me come at this from two ways. One will be from kind of a diversity and inclusion, which is a big part of our strategy.

MS. BUSETTE: Okay.

MR. AVEY: And then second, via education. And actually let me start with the second one, education. So we at HP have a strong sense of social responsibility. And that crosses many different vectors, from D&I through education.

MS. BUSETTE: Diversity and Inclusion, D&I.

MR. AVEY: Into things like sustainability. Specifically to our recruitment and how we attract talent, if we start with the education base, you know, we do it at the global level. Gus Franklin, who's here, leads our Education Practice and pioneered the National Education Technology Assessment, which we've done with countries like Peru, Equator, Hungary, Indonesia, to help them assess where they're at from an education perspective, where they need to go.

We've now actually now taken that down locally. And we're doing a study in the State of Idaho. How that came about is Gus and I were having a conversation around this net assessment. And really was focusing time on developing economies, but if you look at -- and I hate to say this because I'm from Idaho -- but if you look at our statistics and our educational outcomes, we look a lot like a developing economy, right?

In fact Jim kind of framed it up in his early data when he talked about that happy path to success. I'll stay away from planned/unplanned pregnancy, that's my area of expertise. But I will tell you that the next step was showing up ready to be educated in kindergarten. Forty-nine percent of the kids in Idaho show up not ready to be educated. Definition of ready to be educated is ABC, 123, print your name and know a few colors, right? Forty-nine percent of our kids can't do that.

We talk about learning to read by the third grade so that after that you can read to learn. Half of our kids don't achieve that statistic. And so we believe from a community perspective, it's incumbent on HP, it's incumbent on the companies, it's incumbent on the community partnerships we have to kind of raise all boats with that rising tide.

And so to that end we've done a number of things over the years. But are currently in the process of participating with Marcela and with Gus, as well as with Idaho Business for Education, to create a study where we're assessing kind of the baseline of where Idaho is in right now on education methods and outcomes, and how that can be improved. And we'll deliver that to the governor in about a month.

The real importance of that is you have to understand kind of the state of the state of politics in Idaho. I think it's well known we're a red state. You can perhaps even argue we're the reddest state. Two cycles ago the Democrats ran an independent and the Republications ran a libertarian. Just to give you an idea of how far it is. And what that means is that we have a legislature that has very strong opinions on taxation, keeping it down. Very strong opinions on spending, keeping that down. And even stronger opinions on education and things that should be done in the home. And so for that reason we're one of the very few states that spends zero dollars getting kids actually ready for school.

And so we at HP believe that we're in a position to go drive that conversation and improve those outcomes. And with other business leaders, approach the legislature with something they're not used to hearing, which is tax us more, spend more, improve these outcomes, create these better outcomes that Jim talked about, both for society as a whole as well as, frankly, as employers, right? We need that talent.

And so that's a place that we put a lot of our energy. And again, at the global level, the national level. And then I've had the great opportunity to become involved at the state level.

The other thing we focus on heavily in a differentiated way, is diversity and inclusion. We talk about talent is our only criteria, but we really put wood behind the arrow on that. And again, Jim did that, the perfect setup this morning, but if you're out there trying to attract talent in a very competitive market, we have these big groups of marginalized people that are incredibly talented. But all you have to do is look at the statistics, whether it's folks from an LGBT kid community or folks from a people of color community.

One that we're actually centering a lot of effort on now that we have in the past which is new, is folks that are on the spectrum, right? We have these people that are just incredibly talented on the spectrum, the autism spectrum, and they can do great things, especially in an industry like ours, right? Think about software engineering, how powerful they could be. But they don't have the traditional interview skillset, right? They walk into a job interview, they walk out, they got no job. And so we're actually reframing how we go out and do job interview for people that we know that are on the spectrum, to be able to identify the skills and talents that they can bring to bear.

And if you think about it from just a pure social responsibility perspective, we think that's a great thing, right? Even if we weren't deriving some HP benefit out of that, we think that's a great thing. But then from an HP perspective, absolutely gives us a competitive advantage.

And so we talk about driving diversity, we do that. The other thing is inclusion, and too often the word, there's diversity and inclusion and the immediate discussion goes to diversity, which is largely a hiring retention advancement decision, right? Which means it's kind of solely held with management of the company, right? Because non-managers don't get the opportunity to hire, they don't get the opportunity to promote, they don't typically drive advancement. But inclusion is something that everybody does every day. And we like to say we want folks to be able to show up at HP as their whole self, whoever that is. They don't need to act like me or talk like you, or be like them, you know. It's show up, and that might be a millennial that has a lot more accoutrements as they come to work, or somebody more like myself that doesn't have as many accoutrements or any hair.

But we really think from an inclusion perspective, diversity are kind of these big decisions you make and are largely held by the management. But inclusion is every single person, every single day, every single hour. Every person in the company at every moment of the day has an opportunity to do something that will make people feel like they're

part of the club, or to make them feel like they're not a part of the club. And to the extent that we can drive inclusion, we think it also helps drive that diversity angle.

So the two pieces we're really focused on is raising the tide with education at the global level, the national level, certainly within Idaho, and the driving specifically on diversity and inclusion, both from a social responsibility perspective as well as, frankly, a sustainable competitive advantage.

MS. BUSETTE: Thank you very much. I wanted to go back to you with a similar question, you know, Amgen obviously operating in a very competitive environment in biotech, and with a tremendous pipeline workforce in the sort of Boston/ Northeast corridor. But still, people can go to a lot of different companies. You've a lot of talented people, and there are a lot of different opportunities for that.

In terms of ensuring that you have a diverse workforce, what are some of the steps that Amgen has taken there?

MR. SEEWOESTER: So, yeah, I think the HP story is really interesting and mirrors a little bit also what we do at Amgen here on the diversity and inclusion. Maybe I start like we operate not only in the Boston area. As well, if you refer to this, we are present in a hundred countries, and we engage with all communities in these hundred countries wherever we are here.

The New England/Boston area is a quite competitive area. It is the biotech hub in our industry. This is where everything is happening in the world of biotech here. It's very competitive. We have successes, we have also losses. Diversity is very important for the company. It starts, like you referred to at the hiring range stage already, and then really the inclusion part similar to the way you described it very elegantly, really everybody's opinion wants to be heard, needs to be heard.

We have certain chapters for certain groups in the company. They are present in certain locations more than in others. Rhode Island happened to be, I have to admit, not a highly diversified location yet. We have 670 people there, compared to over

4,000 in other locations here. So you get a certain kind of filtered and artificial kind of diversity, all right? And we are working on that, we are actively fostering this.

So to the teaching part, and we heard a little bit about that, and I want to kind of digress a little bit from the diversity, inclusion, if you wouldn't mind, right, on the teaching part. We heard that in the first presentation. Remember the blue chevron with the red chevrons that could be derailers for your life here?

And similar to HP kind of, yes, we give a very generous kind of maternity and paternity leave on the first chevron. But Amgen's activity already starts on the second chevron. We kind of really engage in kindergarten on science fairs with judging. We want essentially excite people for science and mathematics early, early in their life. And then the next stage we have our Smile Program where it's from fourth grade onwards to twelfth grade post kind of school where we teach people science and mathematics in a very kind of hands-on work so they understand it and get it more ingrained. Then we have the college crusaders that focuses on increasing the high school graduate rates.

And then one of our hallmarks is the Amgen Biotech Experience. We use our Amgen Foundation of, our charitable foundation, kind of to really oversee all this, but the Amgen Biotech Experience is one of our cornerstones since year one of our existence here. We have, in our history, trained over 700,000 students in the United States, trained 1,500 teachers in almost 1,000 schools.

And what we bring into these classrooms, training the teacher, is molecular biology and microbiology experiments so that people get excited for the science, right? And hopefully with a few hopefully more women than boy, right, girls and boys, it sticks and they really want to pursue a career in science, right?

And then it continues kind of. We essentially help them from kindergarten onwards up to the point where they enter a company like ours or one of our kind of like competitors, kind of really they're excited about the science. They're excited about innovating medicines for the next 20 or 30 years. And that's how we are very systematically

build that kind of domino and network of helping students.

We do this customized in every region a little bit different. And in Rhode Island there are certain kind of programs we foster a little bit more on than in others, but it's customized to the location.

MS. BUSETTE: Excellent. Thank you very much. A quick follow up for you, Scott. So, you know, Rhode Island has a number of communities of color, some of them not doing particularly well from an economic perspective. What is it that the State does to try to break some of the economic cycles there and try to get those folks into the mainstream of the economy?

MR. JENSEN: Sure. I mean I think the biggest part of it is if you don't have the kind of connection that Amgen is building, you can't see yourself, even if you had the talent to do it, you can't see yourself engaged in an industry. So, you know, the Labor Department showing up at diverse locations and saying "Hi, I'm from the government, and I'm here to help," is not the most effective. Not the way to do it.

So again, it's this partnership, right? So we partner with, you know, hundreds of different community organizations and, you know, build those kinds of pathways so that people who they are more familiar with and work with on a regular basis are able to hear about a possibility and say "Oh, you mean, there's a training opportunity for me, and, you know, I can go and work on a team that builds drugs at Amgen and the whole other side of Rhode Island, which is a 20-minute drive." But in Rhode Island that's far. And so the answer is "Yes, and we'll give you the skillsets to do it. And not only that, you have a very welcoming place because you happen to be amazing at mathematics and love process, and we have a place to really plug you into the economy." So it's that partnership that makes things real for people.

MS. BUSETTE: That's great.

MR. SEEWOESTER: I think this is how our relationship actually started. We told you before, these 150 people. Most of them, they will join the company on three

different kind of entry levels. And as we were looking in the local community we looked at the university, there's a few people with a Master's Degree who we could kind of bring in from there. Then there was an educational center on the far other side of the spectrum of education. It was all built around the submarine kind of business in the State, generating welders, right, and we could create or sought process technicians from it. And then the college in the middle, that had their own curriculum.

And as we were doing this together was caught, we recognized that the curriculum all in itself kind of made sense but they were not connected. So they were not seamlessly. You could start essentially tiptoeing into our industry with a few kind of night classes, seeing if this interests you, and then build on that really to ultimately get a university degree, but you don't have to.

So we actually used some of the investments kind of that the state is making to really work with these academic institutions to augment the existing curriculum so that at the end it's a cohesive story, right? And students, whenever they feel they have to leave or want to leave out of an educational path, they can leave. And they found a lending spot at a company such as Amgen, there's no gap at that moment. If they want to continue they can continue on the academic career pathway as well.

So this is what really brought both of us together, and we're all kind of excited. And as we talk about the new companies that are interested to join our little environmental ecosystem in Rhode Island, they also get excited about that, that kind of picture that we framing up for them, right?

MR. JENSEN: Yeah, it's true.

MS. BUSETTE: That's great. Thank you very much. Now normally, we have about a minute left in the actual panel, so normally I would start to pivot to getting awesome questions from the audience. But I'm going to take moderative prerogative here and I'm going to ask one last question of Bill because there's really an interesting issue in, or was an interesting issue, that HP encountered in setting up shop in Boise. And that has to

do with white supremists.

MR. AVEY: Always a great thing to have.

MS. BUSETTE: Always a great thing to have around, and always a great note on which to end the panel.

MR. AVEY: I've never heard anybody get a laugh out of that. Good job.

MS. BUSETTE: So talk a little about, you know, the presence of white supremists in Boise, and some of the challenges that that posed for HP, particularly if you want to hire a diverse workforce, global workforce, and how that was managed.

MR. AVEY: So real quick, I'm going to ask the audience a question. One word, one word only. If I say the state of Idaho, what's the first thing you think of?

AUDIENCE: Potatoes.

MR. AVEY: Thank you, we appreciate that. Potatoes. Which by the way is not our number one agricultural crop. It's actually dairy, which is a big reason why Chobani came in. By the way, along with an incredibly powerful workforce driven by refugees. HP, excuse me, Boise, has actually been the highest per capita refugee resettlement city in the United States of America for the last 20 years, and we're very proud of that.

But, kind of an aside there. The reason I say that, if I would have asked you this question 25 years ago, there's a good chance you would have something like "Aryan Nations" or "white supremacy." And the reason you would have said that, for folks that don't have the recollection, in the late 70s and early 80s, the Aryan Nations bought a large piece of property near Hayden Lake in Northern Idaho, with the stated intention of creating a separate white homeland within the United States. They literally wanted to separate from the United State in Northern Idaho, little bit of Eastern Washington. And unfortunately, that's who Idaho became known for, right? We were the State with the Aryan Nation, with the white supremists.

Now it was always a relatively small part of our population, relatively isolated, but nonetheless, that was our brand.

I can't say that HP or any of the local business community kicked out the white supremists, that distinction goes to a late Catholic Priest by the name of Father Bill Wassmuth. And in fact if you want to read his book, it's fabulous. It's called "Hate is My Neighbor." Horrible story, fabulous book, but Father Bill literally drove these folks out. Through legal means, through non-violent means, I mean you go down the route. But nonetheless, we still had this reputation as the state of white supremacy. It's, you know, potatoes is fantastic.

And so in the mid-90s there was a touring Anne Frank Memorial that came to Boise. And it drew tens of thousands of people. And it became very clear to the community leaders, including the business community, that there was pent up demand for not just not having white supremists, but being very much on the record around how we feel about human rights and the treatment of people.

From that became the Center for Human Rights, eventually renamed later to the Father Bill Wassmuth Center for Human Rights. And so in Boise, Idaho, formerly known for the place with white supremists and the Aryan Nations, we actually have the country's only Anne Franke Memorial. We're one of the few places in the world that has on permanent display the United Nation's Declaration for Human Rights. And we have this organization that actively is out teaching in the schools, so we can get the folks early, right, because, you know, hate is taught. Nobody wakes up born hating and people get to them along the way. And we want to make sure that we get to them early in life, in the schools, to make sure that they get a complete picture. As well as, frankly, a monitoring function. We don't want to have this happen again, have it be a surprise, and all of a sudden, you know, this large piece of property has been purchased and all these folks have moved in. And, you know, the motto of Idaho is "Esto Perpetua."

And so through community leadership I think we've been effective, not just in changing the brand, I use that as an example to evidence the fact that 25 years ago you might not have said potatoes, and now you did. That's actually the secondary and least

important part. The most important part is we agreed to find ourselves now as a very inclusive community.

Now we've got work to do in terms of actually making the numbers reflect that, but nonetheless it's kind of a first step along the way. It was a very powerful story in the State.

MS. BUSETTE: Great. Well thank you very much. I really appreciate that. Thank you to all of you for your great perspective. What we're going to do now is we're going to shift to the audience. And I'm sure all these four fabulous panelists, that you have some questions.

So what I'm going to do is I'm going to take two or three at a time, to make sure we get, you know, a full range of questions, and then let the panelists decide which ones they want to answer.

So if we can get the mics working it would be great. So we have one, two, three over here.

MR. TURNIPSEED: Thank you very much for your presentation. I'm Stephan Turnipseed, I'm with a company called Pitsco Education. We work in the K-12 space primarily. And as you know, there is some compelling challenges with the education space today, especially in the K-12, around a number of areas.

One of the challenges that I wonder how you've addressed and how you do manage this, is soft corporations engage in rather checkbook philanthropy as their primary vehicle. And unfortunately, while that's good, unfortunately money isn't really the problem if you really take a large statistical look at it. How do you engage in a direct manner with these children with the school system to materially change the environment, the climate if you will, inside the schools wherein and around Idaho. How do you actually, or do you?

MS. BUSETTE: Okay. So a question about environment in schools, but I think also I'm going to broaden your question a little bit about environment outside the schools, because there's a lot of research that shows, and Jim had mentioned this too, that

in an environment surrounding schools is important because most learning actually takes place outside of the school, right. So that's question number one. So question number two?

MS. PHILLIPS: Hi, Gretchen Phillips, thanks for your presentation. Just a quick question. We started with Marcela taking us through this fascinating data to how to think for companies and governments to think about how they might locate and expand. I'm just curious to hear your take as leaders in the private sector and the public sector on what from that framework really resonates and where you see the strength in the application of that. You know, would you actually use that to think about where you located? And are there key factors that drive your thinking that would not be captured in that framework which are worthy of consideration?

MS. BUSETTE: Okay. Question on the framework and the implementation and application of that. Go ahead.

MR. MUSKIN: Thank you, I'm Joshua Muskin from Geneva Global. I want to thank you all for this uplifting and inspiring set of stories.

But I'd like to challenge some of the optimism. Also bringing in the discussion this morning from the automation, and focus particularly on the goal that you set, Marcela, of accelerating job growth. And I don't share the optimism that with automation and the sort of job growth statistics that you're presenting that there's meaningful work for everybody in the future.

And just want to get some feedback on the difference between preparing youth today, children today, for meaningful employment, productive employment in the future, and rather preparing them for meaningful, I'll use the word occupations. So thinking of a guaranteed salary or a guaranteed wage, but doesn't require you to justify your ability to meet a certain living standard because you're contributing to the economy, but because you're occupied, fulfilled in those sorts of ways.

So wondering where that fits into this discussion at all. Thank you.

MS. BUSETTE: Okay. Great. So we have a question about opportunities

to influence the learning environment very broadly, both inside and outside of schools.

Another one on whether the framework that was presented, which really focuses on shared occupational similarities, is one that could be used or that you in part use when you make decisions about where to locate, etcetera.

And then a third question about the nature of a growing economy. Does the growing economy necessarily mean increased employment, or does it mean that some people will be employed in a more traditional sense but others will be occupied, meaning doing something that potentially isn't, you know, where you're not potentially paid. And how do we prepare people, if that's the scenario, how do we prepare people for those kinds of opportunities. Those are our three initial questions.

MS. ESCOBARI: I'm happy to take the last one first, speak about it.

MS. BUSETTE: Okay, great.

MR. ESCOBARI: Because it is -- I think you're right, and I don't think I will say that I am necessarily an optimist. The reason for doing this work is because I think the system will not solve it by itself.

And what we've seen, again, there's friction in the system, and there have been very important changes where we've had friction in the past to solve it. You know, secondary education appeared when we had the agricultural revolution. That was big.

We need dramatically different scaffolding for the changes that we're going to see. So I have in the report a talk about the promise of automation. I believe in what Neeti talks about, that it has the potential of really making jobs better. Because jobs have become worse, and sometimes technology has worsened the jobs. It uses platforms to be able to compartmentalize work and actually knowing that I have a 100 percent turnover rate if I'm a retail company, I want to make the difference between two employees, you know, non-existence so that if he doesn't come to work because babysitting, you know, fell through, I can put this other worker and make them interchangeable. Which means that the knowledge that that person brings is not specific, right? And pay them as low as possible.

So guess what? Which means that he's going to have more babysitting problems. And instead of saying how can I change my operational model as a company so that I can create better jobs that actually allow me to pay people better, right? And that's an operational choice for companies to do.

And I think there needs to be a lot more research, a lot more examples. And there's work from Zeynep Ton from MIT talking about what are those changes to give workers more agency, allowing them to make different jobs so that I can afford it.

But I also think that as we've seen, you know, I've seen, you know, my friends in economic development, I've seen this in countries where we are seeing the growth of an informal sector in the US, right? All these jobs that took us a century to build, the infrastructure of benefit, is being dismantled. So it's not that jobs don't exist, it's the kind of gig economy is taking that role of the informal sector in many of these countries.

So I do think that aside from pursuing very tailored, you know, growth toward more complex industries, there's a whole set of other companies that need to lift the bottom so that those jobs are, you know, allow people to have a, you know, good quality of life.

MS. BUSETTE: Excellent. Any thoughts on influencing the educational environment outside or inside schools?

MR. JENSEN: So one of the things that we're doing in Rhode Island is investing fairly, in a targeted way but in a big way, on summer internship opportunities. So, you know, again, I think we tend, at least in my experience, to do the things we're familiar with. My parents are teachers, I'll become a teacher. My parents do something, I'll do that because -- and I think that's mostly about horizontal possibilities. You see what you can actually do, and you tend to do it.

So in Rhode Island we are recruiting very talented kids who otherwise might not be able to have a really integrated internship as rising seniors, and teach them soft skills in a boot camp kind of way, actually pay them all summer long so they're making some

money and able to save. And with care, creating internships in great companies like Amgen, CVS, General Dynamics, Electric Boat, smaller accounting firms, all kinds of firms where these students are really going to spend some time with somebody who's going to pay attention to them at the company and leave them with a feel for, you know, that you never knew what they did at an insurance company. And it's kind of interesting.

So maybe when you're done maybe you go to college, maybe you work at Amiga Insurance. So that kind of program I think is one that shows a lot of promise.

MR. SEEWOESTER: The question at the beginning was an interesting one, right. Kind of if we all reflect a little bit of how we learned when we were kind of in school, we often probably had something written in front of us, we learned through books, right? These days education has much further advanced. I'm not longer reading actually books or instruction manuals, I hop on YouTube to immediately sequent in five minutes three different opinions of how this piece needs to be changed. And I immediately have a knowledge level kind of infused in me much faster than I ever had in the past by just reading.

So to answer your question, I think it's my different concept that kind of answer to this. In some classes you go in, kind of you teach with kind of a dialogue, with interaction, right, and some people learn the fastest that way. But you should also think about not everybody essentially in the world is able to go to school every day, right? With the ubiquitousness of this device here you can reach a lot more people than a school class every day. And there's an academy called the Carnac Academy where many large companies contribute to, ours as well, with educational material. It reaches kind of kids everywhere in the world. They only need a computer or cellphone and they can just learn in five minutes the fundamentals of mathematics or part of mathematics, right? So keep that in mind as well.

It is not only about the class and the ratio between a teacher and the class. These days there are many, many multiple avenues of teaching available to the world than maybe at the times when we learned, right? Scott?

MR. JENSEN: Yeah.

MS. BUSETTE: Excellent. So to your question about the use of the tools, I'm going to say why don't we follow up with the panelists afterwards. I think each of them has talked about the factors that they use in thinking about whether to expand or to set up shop. So I think maybe you can just follow up with them afterwards.

I'm going to take two more questions, and then we're going to head to lunch. So I have gentleman here and young lady here. And those are going to be our last two.

MR. MEHTA: Thanks. Hi, I'm Parag Mehta, I'm with the MasterCard Center for Inclusive Growth. I've heard Marcela tell the Boise story before, and it's fascinating to hear your perspective on it.

One piece I'm missing is in the last 30 or 40 years what happened to the children of the HP employees? You talked about the statewide statistics on education, but if those kids get a good quality education, if those kids start learning, prepared to learn, did they get the skills that you would be looking for. And what percentage of those kids decided to stay in Boise after they finished school? Did any of them come to work for HP?

MR. AVEY: Yes. A multi facet question. So first, with respect to the kids of HP employees, and I'm an HP father with kids, you know, living and growing up in Boise. As I said our outcomes statistics really are, you know, kind of developing economy. We're bottom of the 50 states, you know, 47, 48, and don't compare well favorably to other countries. But, it's a tale of two cities, right?

So if you're in the city of Boise proper, or one of the surrounding metros, we actually have very good education systems, very good outcomes. In fact our kids are even fortunate to get some Federal college acceptance rates because if you've ever read a college press release, it talks about SATs, ACTs, year book editors, number of states, number of countries. Well guess what, there's always a kid from California, that's not always a kid from Idaho. So within the Boise metropolitan area, our education is actually pretty

good and on par with other places. But that also is, you know, 600, 700, actually I should even say 500,000 of our economy because 200,000 in the outlying areas are more like rural Idaho. That means we have a million kids that are getting an absolute sub-par education, right? So if you got a weighted average and you got the 500,000, you know, offspring of 500,000 up here, you know, that's what's down here. So we have a rural issue to address.

First part of your question, if you want to come to work for HP in Boise, Idaho, come, your kids will have a great education. But it doesn't mean we can ignore the rest of the State.

In terms of retention, I don't know the statistics on it. Anecdotally I would say about half stay. We do get kids into Boise State and into Idaho that come back. I have a lot of those graduates working for me. I also recruit a lot of talent from all over the world. And in fact I'm not from Boise, Idaho, right, so we bring folks in from everywhere.

And, yes, it's a company where we have multiple generations, like Amgen. I'm 21 years at HP, I'm still the new guy, right? And so we have multiple generations that work through, and in fact I think I've got two or three kids of my peers working in my organization now.

MS. BUSETTE: All right, excellent. One more question. There was a young lady over here, we're going to take that.

MS. GEBREMARIAM: Hi. My name is Hiwot Gebremariam, I work for USDA Department of Agriculture, World Development. My question revolves around the use of technology to potentially improve diversity and inclusion, especially in the context of having remote workforce.

Have you seen a trend in your research where core location is not only determined by having close physical space, but also, you know, kind of determined by technology space or Internet? And are there policies that you would recommend or already in place that is considering use of technology to connect, for example rural workforce or remote workforce with urban counterparts? And are industries thinking of this opportunity to

recruit workforce in remote areas and rural areas?

MR. ESCOBARI: Hard question to end with. This is the question. And it's something that, you know, Representative Ro kind of talked about of why this is a challenge, which is what's interesting about growth is that, you know, growth is not inclusive by nature. It's actually exclusive by nature. You know, this capability approach that we talked about, it aggregates in places. There's a reason why cities become the engines of growth.

And that's why you have to be very purposeful, right? Even technology, with the advent of technology in the Skype and the value of proximity has actually increased rather than decreased. So the way that we think about inclusive growth is, you know, how do you allow people to participate in a networks that make them more productive in our economy. And these networks can be physical, the roads, the infrastructure. And it sounds redundant, but those are things that still we don't have in America. You know, thinking that Broadband is still not a, you know, given in rural America. That's like the most basic way in which many of these people are going to be able to participate while staying in, like it's not part of the schooling system. And, you know, it's got to be part of the whole system, but it's a given. And I just learned today it was only $40 billion. So really, that should be a no brainer.

But also we're trying to understand what are the businesses -- I mean cities also are expensive. And there's certain industries and certain models beyond agriculture that can be disaggregated to function successfully in rural areas. And trying to understand which are those industries that could work in rural areas is important.

But I think creating these networks to bring people in using technology, of which, you know, Broadband is the one of one, I think it's part of the solution. And the kind of work that we talked about of making sure that the capacity to contribute to this industry is dispersed. And that has to be very purposeful, equally for companies who decide to recruit, you know, it doesn't happen naturally. And this is what I'm hoping that in a tight labor market and all the things we're starting to see, the social consequences of this unequal

world, is going to create a more dramatic impetus for companies to, you know, to go beyond the cities.

MS. BUSETTE: Well I have a couple of announcements that you'll want to hear, but before doing that I want to thank Marcela, Scott, Thomas, and Bill.

As you know, events at Brookings are really a team effort. It really takes a lot of professionals to pull this together. So I also want to thank our Event staff, our Facilities staff, and our fabulous Security staff.

We are going to be moving into lunch, so it's going to be set up in the hallway, and there's also an overflow room over there. There's additional seating available. If you have any questions, please ask our staff, we all have nametags on. I want to stress that it's going to be really important for you to be back here by 1:55 so we can get the next panel started. And with that I want to thank you all for coming. And I also want to thank our online audience as well. Thank you very much.

SESSION 3

MS. WINTHROP: Great. Thank you everybody. Welcome back. For those of you who are just joining us, either on the webcast or here in person, I am Rebecca Winthrop. I am a Senior Fellow here at the Brookings Institution and I run our Center for Universal Education. And I am really pleased to be able to share the stage with three wonderful panelists. We are kicking off the second half of the symposium, which is really focused on the resilient people piece, the education and skills development piece.

We are going to start off with looking at K through 12 and what is this idea of resilience in the future of work mean for schooling and schools here in the United States. And I am really happy to have joining us, Justin Rydstrom, who is the CEO of IDEA Public Charter School. You have full bios in your packets. So, I am not going to go through all the wonderful things everybody has done. Ed Hidalgo, who is the Chief Innovation and Engagement Officer of Cajon Valley Union School District in Southern California. And Esther Care who is a Senior Fellow here at Brookings with us at the Center.

We have carefully sat girls on one side, boys on the other. So, let the games begin. No, I am joking. So, one of the topics, when we were thinking about this issue, this topic, about the future of work, how you have to, sort of, marry the conversation around economic development and job creation and what you can do in cities and places, like what we talked about in this morning. How do you marry that with education and skills development and talent development? And I would say that the first thing that usually pops in people's mind when they hear about, sort of, education and jobs or education and future of work, people think of high school, preparing kids in high school. They think of technical and vocational education.

So, Justin I thought we would start with you. You lead a charter school here in the district. It was -- I hope you don't mind me saying this, you well know this and it's a -- and it bodes very well for you, but in 2012 it was, I think, the worst performing high school in the district. Pretty close, pretty close to the bottom of the barrel but now it's in the top 10. And large part, thanks to a lot of your leadership, a lot of the team you have got in place. And, I think, it would be really helpful just to tell us a little bit about IDEA Public Charter School. Who are the kids? What are you trying to do? You know, give us a little lay of the land of education in Washington, D.C.

MR. RYDSTROM: Sure. So, actually there was a really great slide that Jim Shelton had up, for those that were here this morning. And it, you know, showed, sort of, D.C., the country and then there was a focus on D.C., and you saw on the map the Anacostia River and a large red zone, largely on the right of that. And that was talking about, essentially, the lack of opportunities as measured by being able to do better than your parents. And that is largely who our school serves. We are located in Ward 7 on the Deanwood neighborhood.

We serve about 325 students and we are 98 percent African American, 2 percent Latino. And the vast majority of our students come through -- when I say vast majority, I mean, 82 percent of our students come to us reading below grade level in the 9th grade, from over 30 different middle schools and 95 percent of our students come to us below grade level in

math. And the average reading level for our incoming 9th grade class this year was 5th grade and the average math level was 4th grade. And 30 percent, full third of our students were below the 3rd grade level. So, I mean, we are talking 6th grade low -- 6 grade levels behind coming into high school.

So, that is a, kind of, a snapshot of who we serve. Half of our students are on SNAP benefits. Another third are on welfare benefits and another third are -- some of them overlap, of course. And another third are overage and under-credited in high school. And so that's --

MS. WINTHROP: That's who your kids are. What -- give us a little -- how unusual is that for -- and maybe it's really back to the picture that Jim showed in morning of two D.C.s. One, sort of, wealthy and, you know, economically upward and is socially mobile and other not. Is that normal in D.C.? Like what -- for the district, for this school district, what is sort of --

MR. RYDSTROM: So, I think unfortunately --

MS. WINTHROP: -- some of the average pack? Yeah.

MR. RYDSTROM: -- as was discussed even on the last panel, you know, there it's unfortunately normal in too many of our cities. You know, it's really a tale of two cities in a lot of places. D.C. is not unique in that way. But it is normalized here. I mean, we are only talking about, you know, this school is seven miles from where we are sitting now. And the level of disparity is, you know, honestly I think, unconscionable in our nation's capital.

MS. WINTHROP: And what's the percentage of kids who graduate from high school in D.C.?

MR. RYDSTROM: Currently, I think, the city-wide average is somewhere around 70 percent.

MS. WINTHROP: Okay.

MR. RYDSTROM: But the, I think, one of the more important statistics that should really be looked at is only 16 percent of students that are in D.C., D.C. public schools,

public and charter, are graduating from college.

MS. WINTHROP: 16, 1-6.

MR. RYDSTROM: 1-6.

MS. WINTHROP: Only 16 -- oh my gosh, complete college.

MR. RYDSTROM: Complete.

MS. WINTHROP: Okay.

MR. RYDSTROM: And that number is 5 percent east of the river. So, in Ward 7 and 8.

MS. WINTHROP: 5 percent of --

MR. RYDSTROM: 5 percent.

MS. WINTHROP: -- kids.

MR. RYDSTROM: Correct.

MS. WINTHROP: Wow. So, those are the kids you serve. So, what are you -- so, if that's, sort of, your -- the environment in which you work, what are you trying to do? What is the -- what is IDEA Public Charter School trying to do? What's your mission? What's your vision? Yeah.

MR. RYDSTROM: So, our school's vision is really to meet students where they are, as any good teacher and any classroom, at anywhere in the country does. You know, but it's really to make growth, regardless of the grade level they come to us at. 40 percent of our students are students with disabilities coming in. And we want to make sure that we are preparing them for post-secondary success, which is our mission.

And that success can come in a number of ways. And so, while there is a lot of focus nationally, especially often times with funding on college for all. It's also important to remember that post-secondary success, everyone can take different paths to get there. And it's really about meeting students where their interests are, engaging them in their learning. Helping them understand the soft skills and the social skills that they need to be successful in any environment. And then being able to apply those. And so, I think, one of things that makes

us unique is the portfolio process that we use for all of our students and --

MS. WINTHROP: What is that? Can you explain that?

MR. RYDSTROM: -- sure. So, twice a year, middle of the year and end of the year, all of our students do a portfolio presentation. And that is in front of their peers, other teachers, in front of a panel. And they are presenting out on their progress for the year. And they have to show artifacts of what they have done well. Something that they are particularly proud of and be able to explain the concepts that go behind it, really explain their learning.

And that is much more meaningful than a test score or an assessment. And so, then they also have to speak about, you know, our guiding principles. Are you able to work collaboratively with others? Are you able to, you know, be prepared and on time? Are you able to celebrate other's success? And habits like that, that we call our guiding principles. And so, they speak about all of those things and it's a much more comprehensive picture of, you know, their skills and habits.

MS. WINTHROP: And you said, you want to prepare every kid for post-secondary success. Now there is a debate, a hot debate perhaps, within the education community. Do we really want to prepare -- should every kid go to college? Or should you think about multiple pathways? And I have to say, and this is just anecdotal, but it's, you know, everyone who I have talked to over the last, sort of, year and a half, two years, who said, look we need to think about multiple pathways for kids out of high school. You know, college isn't necessarily right for everybody, have had college degrees themselves. And probably their kids are going to go to college.

And everybody else who I have talked to, who have said, I really want my kids to go to college, often have never had the chance to go to college themselves. And they really see that as the path for upward mobility for their family. So, there -- you know, you are sitting right in the middle of that. How do you deal with that? Like, what is your approach? How have you had to come to terms with that big debate? Inside your school, like actively with your program.

MR. RYDSTROM: So, like most conversations in education, you know, I mean, there is no simple answer. The -- you know, one of the best things that I read on it recently was just a couple of months ago. Nancy Hoffman, Jobs for the Future, I talked about, you know, the ten things to consider when you are putting together a career technical education program. And, you know, it's really, equity is the same no matter how you are looking at it, whether it's, you know, your workplace, your school, your sector and the fact is that there is so many jobs, whether you are talking about construction or concrete or, you know, iron worker, whatever the field is, so many of them are still dominated, you know, by white males. And the -- there is still a need for equity in all fields and there is still tons of room to grow. It's not -- our view is not careers. It's just careers, college and/or careers.

MS. WINTHROP: Yeah.

MR. RYDSTROM: We -- all kids leave with a college acceptance letter to somewhere. And so, but it might not be the most advantageous path for them to access that immediately. It might be helpful to work for a few years and get some experience, apprenticeship and then decide, oh, I am going to, you know, that I really liked welding. And now, I am going to own my own welding business. And so, they are more fit for that at the time that they are. And perhaps, maybe don't incur as much debt. But it's really -- you know, I also think to -- D.C., only two percent of the students are in CTE programs, whereas nationally --

MS. WINTHROP: CTE?

MR. RYDSTROM: -- Career Technical Education. So, and that's the Federal Perkins funding. But that's two percent in D.C., whereas nationally the average is 37 percent. And, you know, I think, it's really -- you know, that shows that we are doing a disservice for our students, the majority of which in D.C. are African American, about getting them into high wage, high demand careers.

MS. WINTHROP: Can you just tell us, before I move to you Ed, a little bit about what are, sort of, the, sort of, focus areas that students can specialize in or be exposed to or --?

MR. RYDSTROM: So, currently it's construction design, child development and -- are the two primary ones that we have. Although we are actually at a really exciting time, where we are revisiting that whole thing to make sure just that we are getting into those high wage jobs, not just what happens to be a city-wide initiative, that type. And so, we want to make sure that we are -- by having all students go through, sort of, virtual job shadow, they are able to online with interest inventories, like, we are able to help take that data and decide what do we want to offer moving forward. So, one of the things we powered this year was coding as a pathway to IT and cyber security, which is the kind of thing that we are much more excited about for our future.

MS. WINTHROP: Okay. Great. Well, we will come back to you, I am sure, on this. But so, Ed, moving to you, again, zooming out from one school in D.C. as an example of what it means to bring the K through 12 space together closer with the Future of Work Initiative, you are working at a district level. And you are working, particularly at the primary level, on this World of Work Initiative and you have come from the corporate sector. You have been in the workforce --

MR. HIDALGO: Right.

MS. WINTHROP: -- sector, working with adults for a long time, where there is lots of frameworks for career counseling and all that. You are in a lucky position of working for a very future forward-looking Superintendent here, David Miyashiro, who hired you without any education background really.

MR. HIDALGO: Zero.

MS. WINTHROP: Big risk but it seems to have paid off. Tell us what you are trying to do? And, like, how -- yeah, tell us what you are trying to do. Then I have more questions.

MR. HIDALGO: Thank you. And thank you for your work and thank you to teachers and admins all across the United States. It is one of the hardest jobs ever. You would never setup a business like we setup our schools, where 40 teachers roll up to one Principal.

You would never setup your manager in that situation. And yet, we do that to Principals every single day as GMs. The work at --

MS. WINTHROP: GM is General Manager.

MR. HIDALGO: General Managers or Head.

MS. WINTHROP: Yeah.

MR. HIDALGO: Yeah. So, my work at Qualcomm really informs the practice in the work that I am doing today, having led contingent workforce in hiring -- been responsible for hiring more than 20,000 contingent workers. Half of them that came from other parts of the world. Importing labor into the United States. Leading immigration, understanding TMs, HSBs and O visas. And then hiring out of schools, like Berkeley, Stanford and MIT. And realizing that, you know, many of those individuals, once they get on site, don't know how to manage their careers. Don't know how to tell their stories.

And it makes -- it reminds me of the class at Stanford, Designing Your Life, how it's one of the most popular classes at Stanford. So, these brilliant minds come to the corporation after a conveyor belt of education but can't articulate, who am I and who do I want to become? What are my strengths, interests and workplace values? And when we then ask them, you know, to manage their careers, they look back at you and they say, what does that mean? Because they are still expecting this ladder, instead of this lattice that we have moved into.

And so, our career counseling practice was my first career dream. How can we help these individuals really identify and be able to have the skills to manage their careers? And so, I had a couple of 20 percent time projects, that really influence the work. The second was a makerspace. See my Vice President would say, as long as you crush the core of your work, I will let you do whatever else you want to do. So, these 20 percent time projects came about. The second was this makerspace, called the Thinkabit Lab. It was a dedicated makerspace for middle school students grade 6th, 7th and 8th to come to the company, top floor, have experience with engineering and learn about the world of work.

When 15,000 students came to this lab over three years, it became my full-time job. The vast majority of those students thought they were going to the stadium that was named Qualcomm. It's not funny. You are not supposed to laugh. So, imagine me as I am brining labor from other parts of the world, understanding the gig economy right at its core. And that kiddos from our own backyard don't know that we are the world's largest fab semiconductor company that does its R&D. That was a problem.

MS. WINTHROP: And give -- just to interject, give the audience a little bit of a sense of where Cajon Valley is --

MR. HIDALGO: Yeah.

MS. WINTHROP: -- located and who are the kids in that district?

MR. HIDALGO: So, I got to meet Dr. Miyashiro. He asked me if I would be interested in coming to work in the school district? Would it be possible to do the one-day Thinkabit Lab experience in each one of our schools for every one of our children? I spent a year working on the theory of change and theory of action at the University of San Diego because my career dream was really to integrate clear development for every child, every grade, every year, starting in kindergarten.

And so, Cajon Valley is 27 schools, 17,000 students. We serve 22,000 meals a day. We are the highest poverty school district in San Diego. We have one of the highest numbers of Syrian and Iraqi refugees in the nation. We have students of high wealth and we have students of high poverty. And every one of them has unique strengths, interests and values that are needed in the world. That's what I learned. If you know anything about the Gallup StrengthsFinder, you will understand themes of talent.

The kids in Cajon Valley don't have a different 34 set of talent themes than kids in La Joya and Encinitas or anywhere else. We need those talents. But we have children who have literally come, they have never been in school. By the time they get into San Diego, they have gone from refugee camp to refugee camp. They have never been in school. And we need to embrace them. We need to discover their unique talents. We need to build them and

give them every opportunity to succeed in the world of work.

What is the minimum effective dosage that it would take to help that child be successful for the world of work? That is our mission. Every child, every grade, every year and it begins with the whole community. Everyone, parents, Chief of Fire, Chief of Police, it starts with our trustees. There is an entire ecosystem that needs to be brought into the mission in order to help a child be prepared for gainful employment. And that's what we talk about, gainful employment, whether its apprentice, two-year associates. We have stigmatized labor. We need to find and identify every child's unique strengths, interests and values and prepare them for the world of work.

MS. WINTHROP: And tell us how you do that? What -- you talked about the StrengthsFinder.

MR. HIDALGO: Well, yes.

MS. WINTHROP: People might not all know what that is. What is it? And why would you want to use it?

MR. HIDALGO: We will take one step back and say that we started with the career development framework that is called the Mission of Me. We believe that every child should be able to tell their story. And there is three core elements. Self-awareness is key. Self-regulation is key. Self-ethic you see as key. Every child should be able to discover their unique themes of talent, their strengths, their interest, second and their workplace values. It's the self-awareness pillar.

Secondly, they should have exposure to both academic and career opportunities. How does a child aspire to a career they don't know exists? And thirdly, every child should be able to tell their story. Based on those strengths, interests and values and based on the exposure they have had to the world of work and academic opportunities, that's the guiding framework. We deploy it in our classrooms through four core pillars of integration. And I did say in our classrooms and I did say by our teachers, not at the end of the day, not at the beginning of the day, not by the counselors, by the teachers.

The person who has a 180 days to develop relationship with the child. That loves the child almost as much as the parents, maybe more than some of our parents actually, sadly or families. Every child gets the opportunity to explore a career, to simulate, to have an as of experience, to meet a pro and then to practice. In 15 months our students have recorded more than 60,000 live industry chats with professionals. This is my question earlier to Mr. Shelton. If I was to invite all of you today to a 30-minute industry chat with our children in our inner schools, how many of you would raise your hand?

Why aren't all your hands raised? You all came to this conference, right? Why aren't all your hands raised? I want all your names and emails at the end of this experience. But that's how we do it. Every child deserves to have that exposure and that experience. You can change the life of a child and guess what, you don't have to get in your car or get in a plane and go do it. We can do it through Zoom.

60,000 in 15 months. Kindergarteners talking to engineers. 1st graders talking to zoologists from Utah. 3rd graders talking to imagineers from Disney, right from the classroom. It's possible. So, that's part of the framework and maybe I should just stop there. I get excited about it.

MS. WINTHROP: So, other than collecting everyone's names and emails who raised their hand.

MR. HIDALGO: We will message you. We have got talent here.

MS. WINTHROP: Yeah.

MR. HIDALGO: Exactly, we have talent through.

MS. WINTHROP: Yeah. It's true. We have a whole new program of the, you know, in Verbling up for the Center of Universal Education. Anyone who comes through has to do it.

MR. HIDALGO: An industry chat.

MS. WINTHROP: Industry chat with children and common value.

MR. HIDALGO: Students.

MS. WINTHROP: But tell us a little bit the -- you know, you said something really important. And people talked about it this morning. Scott Jensen talked about it. He said the -- what did he say? The horizon -- do you guys remember what he was saying when he -- people are confined to their horizon of possibilities that they seek.

MR. HIDALGO: Yes.

MS. WINTHROP: And he was talking about, sort of, workforce development in Rhode Island and their program and that they -- there you have to have aspirations and you have to be able to see yourself and see what's possible out there. And so you -- that is what you said just now, that is part of what you are doing. Now traditionally, when you think of K through 12 education and Future of Work initiatives, you know, you have got a career counselor in 12th grade, that was my school experience. Like, okay, you are almost through with school. What do you want to do? Here, you know, take -- I think, I was supposed to be a beekeeper. I am not sure.

MR. HIDALGO: Beekeeper. Don't say it.

MS. WINTHROP: I think I like to be outdoors or something. But I -- I was like, that seems odd. Yeah, I took a -- some sort of survey. And, you know, not everybody has the school available that Justin talks about that, sort of, integrates, you know, college and/or career. But you are working also at the primary level.

MR. HIDALGO: Yeah.

MS. WINTHROP: Like, how do you think about -- how do you think about exposing kids to the world of work in a way that doesn't foreclose --

MR. HIDALGO: Yeah.

MS. WINTHROP: -- what they could be, right?

MR. HIDALGO: Definitely.

MS. WINTHROP: Because part of what you said you want to do is raise their aspirations of what is it possible? If I am in poverty, I have never, you know -- if I didn't even know that a massive company like Qualcomm was in my backyard and I could work there and

here you are rather -- one of the things you just said was, rather than cultivating kids in Qualcomm's backyard to go work for there, you were recruiting talent around the globe. How do you -- yeah? I am repeating myself now. How do you expose kids to the vision of the world of work without them thinking, that's a girl's job, that's a boy's job, that's not a job for me?

MR. HIDALGO: Well, we know in Linda Gottfredson's research out of the University of Delaware and all that I am speaking about today is very research based. But Linda Gottfredson has studied this work and the concept of foreclosure. You probably -- you know Linda, right? So, as early as seven years of age, girls start to say that's a boy job not a girl job. There is some also recent research out of the UK, out of the Education and Employers Group. They have been studying 20,000 youngsters and looking at -- on this idea of gender stereotype. So, I think, it's often and early as a way to approach it.

MS. WINTHROP: Often and early what?

MR. HIDALGO: Exposure.

MS. WINTHROP: Okay.

MR. HIDALGO: Ideally --

MS. WINTHROP: To everything?

MR. HIDALGO: -- meeting people like you who are doing the work ideally, best case scenario, right? So -- and I see a roomful of ladies. I don't know what you do. You are in technology, you are in STEM, women professionals. You know, we had a group of young women in 7th grade who said, we want to meet an attorney, female of Middle Eastern descent. And we were able to source that person through this platform that we use. And I went and watched that session and the attorney came in. She had her hijab on. Attorney, Chicago and these young ladies walked out of there standing tall, like, I can do that. So, there is something about seeing someone, connecting with someone.

But the other piece is also that simulation piece. Like, trying it all the sides. What would it feel like to do that? So, to have that work based learning experience in the classroom is really important, I think. And then those demonstrations of learning that really

show what you have learned throughout those four experiences, the explore, simulate, [00:27:45 inaudible] practice. But the research is -- there is a quite a bit of research on this.

And the fact that a lot of students will see these entry level jobs that aren't transitory, where you might look at the -- so, many of our kids don't leave their five-mile radius. They have never seen the ocean. So, they see what are the jobs in my community? Oh, I see the gas station attendant. I see the cleaners, the liquor store. They don't see those careers as transitory. But the kids from other districts are like, oh that's just my summer job. That's not my career.

Now, we do believe in dignity in all work. But unless you show and help a student envision that future possible self, which is the research theory that we are studying longitudinally, possible selves. You can look at [Daffner Eisenman's] work or Nadya Fouad's work. We want to build each student to have that vision of their future possible self. And maybe more importantly, we want their parents to see that there is a possible future self for their child.

MS. WINTHROP: Interesting. Well, we will come back to that. Thank you, Ed. Esther, let's move to you. We have gone from, sort of, a school that's looking very much at college and career at a high school level, a district that's going back down the chain looking at really integrating the world of work, you know, just exposing kids to the world of work from, you know, sort of, kindergarten on up in the classroom.

You have worked for a long time at a slightly different approach, which is really looking at education systems. And how do you prepare all kids in a system with the, sort of, broad set of competencies, capabilities and skills they need for any path. Which is a different, you know -- yet again, kind of, a different approach. Can you tell us just a little bit about what, you know, what you think K through 12 systems should be doing to prepare young people for the future of work?

MS. CARE: Yeah. Thanks. I was thinking as I was listening how very differently we come to very similar goals and needs. And the way you talk about it, Ed and

Justin, is very humanizing. It, sort of, humanizes the whole education space. Whereas, typically, my colleagues and I are working at system level and we often forget that very real phase. And so, it's very valuable to hear it.

So, where we are working is very much at the same point recognizing that children need to develop skills and competencies or talents, that again would enable them to achieve what we all want them to be able to achieve. And those recognitions are being increasingly acknowledged by large national education systems. And so, this is not just about the US. This is about the world. This is about national education systems globally saying, at the moment maybe our education systems aren't providing exactly what we believe they need to provide for our children and our children's children. So, how can we deal with this?

And I am talking about well developed countries, high income countries, as well as those with low income, that -- we are dealing with a very similar problem right across the globe. And a couple of years ago at Brookings here we did a large-scale survey, looking at over a 150 countries, looking at their national education systems. And looking to see whether there was any evidence of an aspiration toward developing, what we call, 21st century skills, transferable competencies in their students.

So, in other words, we have heard this morning too about the workforce and the increasing need for people who can deal with non-routine activities. So, not repetitive activities but how can we equip our students to be more agile and more flexible. And given the fact that in our education systems we have traditionally focused on standardization on correct answers to questions, how can we change this a little bit --

MR. HIDALGO: Thank you.

MS. CARE: -- to deal with ---

MR. HIDALGO: Did I say that out loud? I said that out loud? Sorry.

MS. CARE: -- just, I will come back to you.

MR. HIDALGO: Thank you. Okay. Thank you.

MS. CARE: So, we really need to be ensuring that the way we teach our

students, starts to reflect some of these competencies that we want to see later on. And we also heard about looking at how we teach in the primary sector. The early childhood sector. And we often prioritize a lot of the social and the cognitive skills there that are valued very highly in the employment sector but we absolutely ignore them in the middle years of schooling. And so, how can we deal with that?

So, what we have seen with these national education systems is that, I think, over 70 percent of these 150 countries, were very clearly saying, we do value 21st century skills. We want our children to learn how to think critically and to collaborate and to communicate and to solve problems. So, there is a very very clear valuing of these sorts of the competencies in a way to the future. But, of course, the next issue is around, how do you go about doing that?

So, we have got huge amount of movement toward it. The sorts of the problems that you have just been outlining, exist in many many other countries in the world as well. And in many other countries, they don't even have a lot of the opportunities that we don't have here. And I understand you saying that not every school, not every state in the USA has equal opportunity, but even more so there are countries that have a great deal less.

So, that's the first point that these needs for education to deliver better what we need is a global recognition, awareness and priority. And, I think, we are past the time through talking about, we need to change things, to how do we go about doing that? And so, that's the sort of work that we are involved in now.

MR. HIDALGO: Thank you.

MS. WINTHROP: So, that's the perfect second question. How do we do it? What should be done?

MS. CARE: We teach them how to think. That sounds terrible. I don't mean that none of us have been taught how to think. I mean, obviously, we are all thinking in this room, I hope.

MS. WINTHROP: Well, we will see.

MS. CARE: Yeah.

MS. WINTHROP: Quiz. There will be a quiz at the end of the session. I am joking. Yeah.

MS. CARE: I think that in our traditional systems some of us have benefitted from our education systems more than have others. You know, for years, particularly in the years that I was in basic education, it was all of the talk about the brightest and the best. Well, that's not where the talk is now. The talk is around Sustainable Development Goals, it's around Education for All. It's not just inclusion in terms of looking at people who have learning difficulties, it's saying that our education systems need to be able to help every student, with what we might have called, higher order thinking skills in the past. Right.

This is not the area just for those who are naturally advantaged by the genetics or a home environment. It's the education system needs to think that every one of those 30 or 45 or 60 students in the classroom, all need to have to access to these learning opportunities. And to do that we need to think very differently about how we teach and how we assess, quite apart from what we put into the curriculum.

MS. WINTHROP: And what are -- so, I want to pick up on that and just hear a little bit about, you know, how do we need to think differently about how we teach, how we assess and how does that relate to the curriculum? But one of the things I wanted to do, kind of, a deep dive on, across all three of you before we come back to that question, Esther, is all three of you talked about different sets of competencies that you thought were important.

Justin, you brought up, sort of, this idea of, you know, soft skills, hard skills and Ed, you know, you talked about confidence and, sort of, engagement and presentation. We heard a lot of this in the morning session around STEM and around the specificity of particular technical, very specific skills for specific companies and corporations. But what you guys are talking about is much broader range of competencies for young people to develop. Can we just do a little deep dive on that? Like, what are the competencies and skills we really think are really important for young people to develop in order to be prepared for the future of work?

Justin, do you want to take a dive and we can just do a little quick round robin?

MR. RYDSTROM: Sure. I mean, I think, one of the biggest is really, you know, grit and resilience. You know, I mean, the ability to bounce back from failure and try again. You know, it's something that, I think it's just -- is so fundamental to, you know, anyone's life work. We have all experienced it but so often if it's not something that you -- you are coming from a family that has experienced tons of trauma and violence in your community, that that resiliency isn't always there and you don't have those things coming from home. And so, I think, that that is one of the biggest ones. And, I think, that goes right into to the other skills like confidence and poise and presence and some of those other things. But, I would say, yeah, that would be my number one.

MR. HIDALGO: We can't predict the jobs of the future, naturally we can't. Today we heard about bots, lot about bots, the bot app store which is really scary to me. And for that reason, I think, that's why the self-awareness piece is so important because so that, no matter what the jobs of the future are, you will still know there is a place in the world for you.

But it connects back to your strengths, interests and values because those are the talents that you will use to be successful doing the work that you are doing, whatever it is that that work is. You will pull and reach back for those talent themes to get your work done, no matter what the job is. So, if you can focus and develop on those talents, that you can understand your interests and they align to your workplace values, then you might find yourself in an environment, personal environment and fit. You might find your place in the world of work, where you are supposed to be. So, self-awareness. Self-efficacy, I think, is key. Do I believe that I can accomplish that goal? Can I set a goal for myself? It's, kind of, a rinse and repeat model. The social cognitive career theory, I think, is a great framework for that, that element of self-efficacy belief.

And then self-regulation, which I was hearing about yesterday from the VP of Education at a local non-profit, with business to say, well, yeah our graduates or interns can't sit at the table with other people and have a meal. And they dress inappropriately and they can't

engage properly. It was an interesting feedback. I mean like, is that really what you are hearing? To, yeah, these kind of skills are seen to be lacking. These collaborative skills. So, I think, those three with adaptability are super important.

MS. WINTHROP: What about you, Esther?

MS. CARE: Yeah. I don't -- let me go actually for specific skills.

MS. WINTHROP: Yeah.

MS. CARE: Not surprisingly. But I think there are two big issues I would like to raise. One is, what is a skill? What is teacher-able and measurable? So, if we think about grit and resilience, are these skills, is the first question. And the second question, and it includes then self-awareness, self-regulation and the rest, to what extent is it possible, in a basic education system worldwide, for teachers to be able to ensure that learners can learn these competencies. I will call them competencies --

MR. HIDALGO: Okay. Yeah.

MS. CARE: -- to get away from the skills. Because this is, I mean, more and more and as we see changes in education systems espousing competencies, we see it in South Africa with their competencies under the K -- R to 12. We see it in Kenya with their seven competencies. We see it in The Philippines with their seven competencies. We see it in Australia with theirs. All of these around, let's equip the students with all of these different competencies or skills. And then we bring in issues like self-awareness, resilience, grit, confidence. Are these skills or are these the outcomes of the developmental skills?

And so, I think, we need to think very very carefully in our education systems about what do we focus on in order to get to the end point that we want to get to. In India, of course, we also hear about the happiness curriculum. So, they want every child to be happy. Well, you can't teach a child how to be happy. You need to equip them with the competencies and the characteristics that will enable them in the long term to be happy. So, let's think very carefully about what are the teaching and learning goals that can be picked up in an education system by teachers in normal classrooms, such that then these lovely

outcomes to which we are all aspiring, will occur. So, it's a matter of what do we focus on in order to get to the higher goal.

MS. WINTHROP: And what's your answer to that, Esther? And I want to add one more thing, which is, we heard in the morning, and I can't remember which speaker it was who said, you know, that was a statistic that 30 percent of African American kids in the US went to a high school that taught calculus. So, nobody has mentioned yet here, sort of, basic calculus. Grit, resilience, self-awareness, calculus, no. The -- so how do you combine --

MR. HIDALGO: Yeah.

MS. WINTHROP: -- I mean, I have my own answer, but this is a topic of much discussion. Maybe Esther, you know -- well, anybody. The academic piece as well as, sort of, these other sets of 21st century skills or competencies that you are looking for.

MS. CARE: Yeah. If we think about something like calculus and actually like Ed here, I have no education in calculus. I am assuming you don't because you said you had no education.

MR. HIDALGO: I have no education throughout.

MS. CARE: Yeah. So, for me calculus would be about knowledge, you know. About learning that particular content domain. And normally, we would have a teacher who has majored in that at school and in college, who then learns how to teach it and teaches it. When we are talking about students learning how to collaborate and to communicate, well, the teachers haven't gone and done a course in how do you communicate with others and what's a good way of collaboration. But nonetheless, we are expecting them to be able to enhance the abilities of students in their classrooms.

So, how do they do that? One answer would be we would like to ensure that the teachers have the capabilities to model the sorts of skills that we are looking for. Because in the teaching process you can be modeling your communication, your interaction, your problem solving, your openness, your readiness for abstraction, all through your teaching

process. And we have all met teachers who do that every day. So, the challenge for us is, how do we help all teachers to be able to teach in a way that models the sorts of competencies that we are aspiring to within our children.

MR. HIDALGO: Yeah.

MS. WINTHROP: And what -- I know you are working on that topic here at Brookings and around the world with other colleagues, around -- with formative assessment. Do you want to say a little bit about how that could be tool to help teachers model?

MS. CARE: Yeah. Sure. So, as many of know, formative assessment is really just the use of assessment in a way that helps to inform the teacher how to keep intervening with the student. So, that formative assessment can be formal or it can informal. So, informal formative assessment is precisely what I am engaging in to some extent now. Some of you, when you nod or you smile, I take it from that that you are understanding where I am at and therefore I can keep talking in the same way.

So, very typical, sort of, iterative procedures that we use all the time. And that's the sort of process that we would like to see that teachers can engage in around encouraging these skills in classrooms on a day-to-day basis, yeah.

MS. WINTHROP: Justin, tell us a little bit about your, like, the teaching and learning experience in your -- for kids in your school, in your classroom. You talked about grit and resilience but do you offer calculus?

MR. RYDSTROM: There are a couple of kids every year that usually take doing Roman calculus, DCCC.

MS. WINTHROP: That was a small joke. But like what -- tell us about -- yeah, what is the -- how do you, you know, interweave these academic knowledge with, sort of, 21st century pedagogy?

MR. RYDSTROM: I mean, I think that most important piece is just that it is always student-centered, so that -- I mean, that's the basis essentially every time -- formative assessments is that, you know, you are, just what I spoke about at the beginning, is that we are

meeting each student where they are. We -- in one of the panels this morning spoke about how challenging that is based on numbers in education today and a typical teacher load.

You know, I think, one of the ways that we do that is by ensuring that we have a very low student to teacher ratio, especially at the high school level. A lot of times there is two teachers in the classroom for grades 9 and 10. And that will be with two teachers and 15 students. So, it looks a lot more -- a lot of times like an elementary classroom, where there is centers and there is movement and it's not what you typically, you might think of as that high school classroom. It's much more interactive and dynamic.

And then, you know, I think another piece is just making sure that the whole point of the career investigation, whatever grade you started in is that you are, you know, really exciting kids about their future. And once any individual has that sense of, you know, this is where I am headed, this is my plan and they are able to see themselves in that space. Whether that's, you know, college awareness, whether that's career awareness, it is what often times becomes the motivator for them. So, just, you know, lots of exposure to a wide variety of things.

So, we regularly do things like, you know, workforce Fridays once a month, where, you know, in the cafeteria over lunches, you know, students all around the perimeter are people with different jobs. So, there might be a veterinarian there with, you know, some animals or, you know, a -- someone from a technology company. You know, just exposure to something that they don't see in a neighborhood. I mean, we are talking about a neighborhood that has one grocery store, you know, to serve an entire ward, whereas other wards in the city have seven. So, it's -- there is not a lot of exposure to some things that we all take for granted.

MS. WINTHROP: Great. And we are going to turn to the audience for questions in a minute. But just last question for you, you -- on this topic of, sort of, integrating the world of work initiative and that whole, sort of, idea you talked about self-awareness. You have worked on a program across the district that integrates this into the curriculum. How do you do that?

MR. HIDALGO: And I think that's when it works best. Obviously, it's when it's an integrated process and the teachers can see that, you know, a 3rd grade realistic career is a forester on her careers grid. By the time students finish 8th grade, if they have started with us at kindergarten, they will have all experienced a minimum of 54 world of work experiences. So, the forester is one of the careers. And gosh, when you simulate being a forester, you use math. You use research skills because in the forester lesson, City Council has asked your class to research five or ten different types of trees that they would like for you to plant in the city square.

So, they want to understand, which would be the best based on our climate and geography, and so which are your recommendations? You are going to actually present this back to the City Council. And so, the students are using mass skills, they are using presentation literacy skills, they are reading, to persuasive writing, et cetera. So, when the teacher see, oh everything rolls up to the career, it's not any other thing. This is actually the thing. This is the why.

So, when teachers get this question all day long, it's like, why am I learning this? It's like, oh, this is why you are learning it. You see, all of these skills rolled into being the forester today. And that's what we are doing. We are preparing you for your futures. And, you know, Mr. Coleman, I really enjoyed being a forester today, is what they say. And I had rather not go to lunch. Can I go out and measure some more trees out in the back?

You know, so the students can do way more than we think they can do. It's usually the adults getting in the way and putting a pause on their learning. They want to go further. And when they start to discover their interest in particular, because we use this interest typology that Esther was going to mention as well, but you should all leave knowing what the Holland RIASEC framework is. Because interests have the highest correlation to career success, performance and income of any of the personality measures based on meta research, James Rounds, University of Illinois, Rong Su, University of Illinois.

So, wouldn't it make sense that we connect to this typology of interest called

the RIASEC and the O*NET classifies 2,000 careers on the O*NET by the RIASEC. Some of you, maybe, know it. Some of you don't. But our teachers are able to create this common language now with students in the classroom. As students are understanding their six RIASEC themes. And they are on this project and, like, oh we don't have anyone with a social theme on our project. Stacey, will you come and be on our project with us. We need some more socialist themes that can train others how to do this project.

We didn't ask them to do it. The students are starting to do it on their own. They are making these natural connections and, kind of, loving their classmates in new ways because they see, like, this really interesting value in a classmate that's investigative, who uses math and science to solve problems. That uses conventional -- their themes to organize facts, date and figures. And, like, there is beautiful research theory from the late-50s that most educators aren't familiar with, that's called the Holland RIASEC.

And so, we are using that to create a common language starting in transitional kindergarten and students can self-report their interest themes and not get boxed in. We are not tracking kids, love all your themes. And one day you will take a valid and reliable scientific assessment to be able to go a little bit deeper to understand which themes am I really? And then you can start having a conversation. Where can that lead you one day? Let's talk about post-secondary and career.

MS. WINTHROP: Great. I heard -- I see people writing down the RIASEC framework and, well, you might have to give a source in a minute. But let's go to the audience. Just raise your hand, we have mics coming around. We will start on this side. We have one, two, three, here we go.

MR. SHAY: Hello, my name is Michael Shay. I have been to the Thinkabit Lab in -- over in Northern Virginia.

MR. HIDALGO: Yeah. Yeah.

MR. SHAY: And I think it's a partnership with Virginia Tech. I think, the middle school students don't necessarily have to go to Qualcomm stadium. They think they are going

to Blacksburg, that's probably why. But when I have been there, in the makerspace and you talk to people that are designing and teaching it, they don't talk in career terms. They talk in terms, like, they want the space to look like an art supply store and an electronic store had a collision. And this whole space is now available for creativity and problem solving and collaboration.

So, my point is that, do you think there is a way to sell this, that is a very non-career ways, that's just, kind of, fun and its learning. And I think a lot of parents who maybe don't connect with, you know, the idea that [inaudible] can be a better career, I think it sells that to them better. So, to what extent do you find that you can connect with people by just forgetting the career steps and talking about, this is just fun.

MS. WINTHROP: Great. Good question. We have Stephan right here.

MR. TURNIPSEED: This one, Stephan Turnipseed, I am working with PITSCO education. I have an industry background. I have a very sordid background but Rebecca has promised not to tell anybody.

MS. WINTHROP: He is a collector.

MR. TURNIPSEED: A collector, there you go. While some people collect [inaudible], anyway. This is primarily more of -- it's probably to Ed than anybody else. But everyone can certainly chime in on it. I think, the big gorilla in the room in education is that the gifted leadership is what's required in order to actually make change in education. And when the Superintendent goes, so does the leadership and then you don't have a scalable -- there is no scalability.

And we see it so often happen. Do you see any mechanisms that can be put in place to support the scalability of programs so that -- because you certainly can't go everywhere and hire Ed's everywhere. So, how do we create a sustainability effort within education, so that these kinds of things that we know work, can be -- can have the lasting effect so, as Rebecca writes in her book, so that it doesn't take us 70 years to get all children, all means all, to the same level?

MS. WINTHROP: Great question on scaling and, David, I might turn to you on that question, if I can put you on the spot. Yeah. Go ahead and then we will loop back around to other questions.

MR. MIYASHIRO: Well, thank you for that. I think we have designed this program for scale and we have received lots of philanthropic donations to help other districts do the same work. And really it's just about community engagement because when you ask you Navy Admiral, your Police Chief, your Fire Chief about what you want the school system to look like, and you lean in and listen, and they tell you to stop stigmatizing the most important work in the community, especially the Armed Services, we want people to aspire to that, not see that as a fall back, then you start to look differently about what types of skills, knowledge and dispositions. And then I think that networking and research and data.

So, we are measuring this work longitudinally with University of San Diego in terms of education to employment. And what that starts to reach publishing journals like Brookings then, I think, others will see is, we should do that too.

MS. WINTHROP: And how do you get -- David, this is really unfair of me to the audience volunteer. But you are Superintendent and you are leading a large school district. So, how do you get to solving the problem that Stephan raised? Which is if one day -- never leave Cajon Valley, but one day you leave, will your programs live on and how do you ensure that happens?

MR. MIYASHIRO: Honestly that -- I got to work with the California Department of Education for 18 months to help them implement computer science. We opened the first two computer science magnet schools in the country eight years ago before code.org. And then asked to serve on this committee for 18 months, looking at the Governor, the Legislature, California Department of Ed and State Board of Education. I was screaming my head off for 18 months telling them, adding a new layer of standards and not changing the system is not going to work.

And I was censored. They wouldn't let me speak at the State Board meeting

because they don't want me to speak out on the system isn't working in California. And so, we went back home and I shared with our Board, we have to do it ourselves. We have to create new metrics, new measures and really do education to employment, gainful employment and we have to create it ourselves and that's what we are doing.

MS. WINTHROP: It doesn't give me hope for sailing. Other questions. There is some here. I will get some women in. Here Eliza on the end of the -- on the aisles, I mean.

MS. ERICKSON: Thanks. This has been a great panel. I am Eliza Erickson from Omidyar Network. This is for, particularly, Ed and Justin. How do you find your teachers? How do you retain your teachers? How do we scale an initial educator development system to scale your school models?

MS. WINTHROP: And then there is a question here from the aisle. Right here. Yeah.

AUDIENCE: Hi. I am veteran 18-year secondary math educator in a -- with highly at-risk youth in a high needs district. And I am wondering if our metrics aren't measuring grit and resiliency properly because it takes so much grit for a kid to get up and get to school, when there is no food in the house. Or if they don't have a parent to come to school. So, do we need different metrics to address grit and resiliency? And does our education system value those skills that those kids have and translate them easily with scaffolding into the workforce? I think, all we have to do is show them a way to get there and they will get there quickly.

MS. WINTHROP: And I think there is right here, yeah. Another question.

AUDIENCE: Thank you very much. I hope this is an appropriate question. But --

MS. WINTHROP: We don't censor here at Brookings.

AUDIENCE: -- okay.

MS. WINTHROP: Like the California State Board of Education.

AUDIENCE: Okay.

MR. MIYAHSIRO: Seriously?

MS. WINTHROP: I am going to get in so much trouble.

AUDIENCE: We won't go there.

MS. WINTHROP: We love California, I take it all back. Yeah.

AUDIENCE: I do too. But since we have somebody from -- I really appreciate charter schools and what they are trying to do. But are we setting up a competition between charter schools and public schools? And I don't want to bring politics into this but you have to. It looks like there is a big movement, more towards charter schools at the expense of public schools right now. Can we address that just a minute?

MS. WINTHROP: Yeah, absolutely. And there was another question. The very first question which I failed to have you guys answer. So, I am going to turn it over to, there is a question around -- the very first question was around, is there a way to engage with kids around some of these workforce, your RIASEC framework, that's just more about fun or is fun and enjoyment a piece of how you would do it or, Esther, I guess, that would be for you too, if you think about teaching and learning. Question around charter schools, teachers, question around measuring grit. So, any of those are open to the floor, whoever who wants to it.

MS. CARE: I love to just going very quickly on the --

MS. WINTHROP: Yeah.

MS. CARE: -- on the fun piece. Of course, there is no reason why education can't be fun. And that's just about making sure that what you are teaching is something that the students want to learn. And that you find ways of engaging them. I think it's very straight forward. And we see great demonstrations of that every day. And, I guess, that means that we need to help support teachers so that they actually feel that the teaching is fun. And I realize that you don't have fun every day of the week but it should be an enjoyable process. It's a natural thing for us to want to acquire information to learn to be competent. This is all just part of being a human being. So, it should just automatically be fun.

MR. RYDSTROM: Sorry. I am going to jump in there because I think that's where we get it wrong most, is unfortunately, you know, there are so many layers in education

and it was talked about this morning as we don't have a -- we don't prioritize education nationally. Its way too complicated at the state -- local, state and Federal level. And there is just way too many players that are involved and there is way too many overlapping politics and priorities. And that doesn't allow teachers to have fun and to teach.

It doesn't come by having, you know, more standards, more layers and at the end of the day, we are measuring the wrong things, to answer your question. I don't think there is any teacher that thinks that the metrics that are on the PARCC exam or Smarter Balanced are, you know -- this is really testing what my kids need to know. And we are not testing any of those skills that we talked about here today.

And then finally, you know, just to answer that question about competition between charter and public. I think there is a competition, of course. Proceeds, buildings, everything, except, I think it's also healthy. I mean, I was -- I started teaching in 2002 in Ward 8, down at the intersection of Malcolm X and MLK. I don't think that my three children, who are all in elementary school, would be attending D.C. public schools if charters weren't where they are now in the city.

I think they have honestly pushed in the district, DCPS to a much stronger, more robust system because of its competitive nature. And it's in the city -- it's about 45-55 now. And I don't think either side is -- I think everyone is fairly comfortable at this point with 50-50. And I think that is a -- I don't think there should be a monopoly. But I also don't think that -- I think of creativity that has come through -- an innovation that comes through a lot of charter schools and the autonomy.

And then to answer the final question from there. Part of that has allowed me, I worked in large school districts, Durham -- Durham country in North Carolina. And, you know, the -- what we have been able to do is match DCPS' pay scale and that is something that is within my control. You know, now we are retaining 90 percent of our teachers this year after -- this is my seventh year. It took a long time to get there. But this is going to be the first year that we are going to retain 90 percent of our highly qualified teachers and it comes through allowing

them to have fun, enjoy the doing and have a lot of autonomy to teach their craft.

MS. WINTHROP: Question. Ed, any of other questions?

MR. HIDALGO: On the Thinkabit Lab question.

MS. WINTHROP: Thinkabit Lab.

MR. HIDALGO: Last year, I worked with a now high school student who was a middle schooler, came to the Thinkabit Lab. He pulled the culinary arts career card. We had a turnstile with career cards, lots of them. He took the strong interest inventory, the super strong, when I was working with him last year. And the career that came back was culinary arts. His parents wanted him to go to the Thinkabit Lab to go into bioinformatics. He don't want to go into bioinformatics. His interests don't align with bioinformatics. So, careers are fun. Why do we take careers out of the conversation? We should leave it in, is my opinion.

Thinkabit Lab was started around the world of work first. But I had to sell it from a STEM perspective because STEM is sexy and it gets the money, unfortunately. But the career piece -- the career piece is what made the difference in kids' lives. And the change in parents' attitude.

Teacher talent, thanks to Dr. Miyashiro and the work that we are doing, we are doing R&D work in our district. Now we have the longest line for teachers when the HR department goes to recruit at the County Office of Education, not the other districts, which is all a sign of the brand that we have created, the employment brand that we have created in our district. Teachers, Principals, we had -- we are overflowing with talent that's applying for our jobs, which is a great problem to have, when you build a talent brand.

And I was trying to explain to Dr. Miyashiro, how difficult that is. Companies spend millions of dollars to develop an employment brand. And in two years since I have been there -- three years have flipped the whole employment brand for this district because of his work. Charter schools, I think, if done right, we are for them. That's another opportunity for R&D and we should compete. And let's compete. Let's get in the mix. Let's do it. Let's do good work, great work happening. And we need to get better on the metrics in what we are --

what data we are tracking for sure.

MS. WINTHROP: Yeah. I want to -- I have -- I want to come back to the scaling question. But Esther, do you have anything else you wanted to add? So, on that -- I am worried about the scaling problem here. And the fact that what if David leaves Cajon Valley, is like nobody -- what's going to happen? Is -- he has been there seven years. That's a long time for a superintendent. What's the average length of stay for a superintendent in the US? Three years. Three years. So, you are doing well.

So, but there is problem with scaling approaches. And so, Justin -- so I am going to ask each of you a question about scaling. But one about, sort of, at the national level, how would you scale? And maybe that's your alignment question, Esther. And you, Ed, about, like, how do you bring these approaches to other school districts?

But, Justin, we were talking in the break before about scale. And in your charter school, you have got funders and you were saying, look, I think, actually some of the philanthropic community does not understand scale as well as they should. And could you share with us what your -- I hope I am not getting you into trouble. So much trouble on this panel today.

MR. RYDSTROM: There go my chances to ever be hired by a charter management organization.

MS. WINTHROP: I can change the question if you want, if I do want people to come back to Brookings --

MR. RYDSTROM: No, it's okay.

MS. WINTHROP: -- and be on our panels. Yes.

MR. RYDSTROM: I mean, I think, you know, the charter management organizations today, you know, it's not dissimilar from districts, you know. I mean, you end up with essentially another district, just albeit a national with different regions. And, you know, the mergers and acquisitions and all of that becomes, you know, part of a business. Is, I think, the biggest challenge is then also once something grows and is large, it becomes too big to fail.

And, you know, whether that's, you know, the largest in the district, the largest in the state, the largest, you know, organization in the country and, you know, it just goes back to my earlier point about monopolies, is that they are -- you know, we have to make sure that there is nothing that is too big to fail.

And that the other piece too is the politics, you know. I mean, I think, when -- you know, I have also been in the school for seven years now, first as the Principal, now as a Director. And that's rare, you know, I mean, that shouldn't be rare. But I think the reason that people leave is because of the shifting priorities. It's -- okay, here is this new assessments coming in and it then trickles down to, okay, how that's -- now, it's how that's being scored. And it's never a reflection of that individual leader or the work that is happening. It's, you know, it tends to be about some other priority, usually coming from politicians or politicians, you know, that also don't agree.

MS. WINTHROP: It's a very diplomatic answer. Do you think there should be other IDEA Charter Schools in the district?

MR. RYDSTROM: I, you know, I don't. I think, you know, districts -- I think it behooves the sector to, you know, go deep in what they do well. We have so much more work to be done and conserve so many more students at our single site. And, you know, D.C. is of course blessed with, you know, geography being a small space. So, we can serve a lot of kids from around the city. I think, too often, what we try to do is, we just try to replicate, you know, everything and offer everything and be all of that to everyone. Whereas if, you know, the more -- it's just like the inch deep versus --

MS. WINTHROP: Mile wide, yeah.

MR. RYDSTROM: -- you know, the mile-wide argument. And which teachers deal with every day as they teach. You know, it's not about teaching all of world history in one year, a formidable task. But, you know, we force that upon kids. It's, you know, you could teach any one unit in world history and the kids have learned more about processes and historical questioning and reasoning than they ever have in their life. And so, I think, you know,

it's the same with schools in my mind.

MS. WINTHROP: Ed, you guys -- so, it's -- you guys have done amazing work under the leadership of David. And you do have a really motivated workforce and fabulous teachers and a long -- and long lines, which is good for you but maybe not so good for other surrounding districts, if you are pulling talent. How do you think about sharing your lessons and scaling up the world of work to other districts? How are you doing that?

MR. HIDALGO: And we have been so fortunate to have other districts come and visit and then ask to do the work in their own districts. And so, we are currently partnering with 10 others that are rolling out the world of work, starting in the earliest grades. And what I see in their wisdom is they always ask, can you start with the why?

And it takes me back to when I first started in Cajon Valley. As I was interacting with teachers and started with training 900 teachers, went to all 27 schools. And I would ask the teachers, send me your LinkedIn so we can get connected. And the teachers would respond back, I am not on LinkedIn, I am just a teacher. And it wasn't so much that they are not on LinkedIn. It was more, like, I am just a teacher.

So, we really had to start with the why first. Why LinkedIn is important to be familiar with? And also, what's happening in the world of work and how it's changing. So, what a simple Amazon Go video will do for a teacher, who has never seen Amazon Go before. And then you say, yeah, you probably have parents, who if they saw this video, would be very concerned. But you should also know that this is where the world of work is going.

This is isn't the future, this is the now. I was just on Amazon Go three weeks ago. So, as we unpack the why -- so this is why we need to prepare our students for this unpredictable future. We need to prepare every child to know there is a place in the world for them, that each of them has unique strengths, interests and values that are needed in the world and it's through what you are teaching in this classroom, this beautiful, wonderful classroom and this common language, that you will be able to build out self-efficacy belief, that self-awareness that will hopefully develop a possible future self in each one of them.

So, we always start with the why and then really six months of Holland, of RIASEC, of focusing on developing that common language in the earliest grades. How do we use our protocols to help students self-report their interest themes? How to integrate it with, like, Charlotte's web or the lemonade wars? Now I am freaking you out. What are you talking about? Yeah, imagine that [Wilbur] is enterprising because he negotiated with the farmer in order to save the [egg sack] in order to save Charlotte.

So, imagine building that cognitive skill with a 3rd grader. No, students can't do that. No, they absolutely can do that. And they do do that. And in most cases, we didn't have to tell them to do that or ask them to do it. They did it on their own, which is even better.

MS. WINTHROP: Esther, what about you? At a national, sort of, system level, how do you think about broad scale spreading this type of, sort of, breadth of skills throughout -- ?

MS. CARE: Yeah. I mean, its right down that charismatic leadership can shift things in the first instance. And that's great. But then you have to make it systemic. So, when I think scaling, I really think about sustainability. So, I am not talking about size. I am talking about can this continue? And when we are thinking about the changing learning goals, about equipping students to think creatively or critically or whatever it might be, we got to change in learning goals there. Not just to come out with knowledge but come out with how do you use that knowledge? How do you manipulate that knowledge?

So, that is a very different learning goal. And that means that what we need to do is to think, not only about changes through the curriculum. We need to think about how do we align those changes with changing pedagogies? How do we align that with changing assessment techniques? And so, these learning goals have implications and consequences for our whole education delivery system and we need to move away from, unfortunately, reliance on the charisma and start putting in the structures, so that it's understood that there has to be total alignment right across these different parts of the delivery system.

If you only have a curricular change, your reform won't work. And we have

seen that in many countries. If you put in change in curriculum and in assessment, it still won't work because you haven't looked after teacher support and pedagogies. So, for sustainability and scalability, we need to be thinking a lot more critically about this being a wholesale change in our education systems.

MS. WINTHROP: Can you -- and we have, sort of, two more minutes, but in closing out perhaps the panel for us, Esther, can you give us an example of a country or a place where you think they are making that type of shift?

MS. CARE: Absolutely.

MS. WINTHROP: That's a good for us to look towards. Yeah.

MS. CARE: Yeah. So, I will talk about maybe three countries, if I have got time.

MS. WINTHROP: Yeah. Sure.

MS. CARE: One is, we have colleagues here from South Africa. The Department of Basic Education and in their grade R to K curriculum, they have talked about different competencies. And just in the last year or so, been thinking very carefully about the fact that they have gaps in their delivery and thinking very carefully about how do they deal with the gaps between what they put in their curriculum and how then they get this actually implemented through their districts, through their teachers and through assessment. So, it's one example of the country that's starting to look at those connectors.

Another one we can look at, the country I am very familiar with, The Philippines. They also put out, some of you might know, the Partnerships 21 Framework. They use that framework in their curricular reform in 2013. They put it through their curriculum but they did not actually progress the skills through their curriculum. They just named them. Let's do problem solving, let's do collaboration. So, you don't see a progression, an increase in skills. They didn't look after their teacher support at all. They have started putting into assessment. But now if we look at what's happening in classrooms, nothing different is happening in classrooms yet, all right.

We look at Singapore and they, as in many ways, have made very good progress. They have made it both in terms of their curricular change. Huge changes in their teacher practice because they are very fortunate. They have got one teacher institute. And so, the Ministry and the teacher institute can work very closely together. So, this issue of alignment of that attending to each of these is in very different states of play in many countries. But the positive thing is that more and more countries are aware of the fact that we do need to bring those strands together, if we are going to affect the sort of change that we want to see.

MS. WINTHROP: Great. Well, that is it. Thank you very much. Please join me in saying thank you for our panelists. We have a coffee break for half an hour and then we will reconvene.

* * * * *

SESSION 4

MS. ESCOBARI: All right, we'll get started. So welcome back. Now in this session we want to move into a topic that actually has been referenced throughout the day, which is the challenges that are faced by low-wage workers in achieving upward mobility. And we want to share with you some preliminary findings of ongoing research that we're doing that is trying to answer three questions, which is who are the low-wage workers, what is the size of this population, and what re their needs, and how is the workforce development ecosystem meeting those needs.

And to present these findings I would like to call up to the stage my collaborator, Martha Ross, who is a Fellow at the Metro Policy Program and also an expert on both human capital and how to get workers, both current and future, to increase their earnings and their employment opportunities.

So, with that, Martha, come on to the stage.

MS. ROSS: Thank you, Marcela, and thank you all for attending.

So as we have heard today, we're navigating a changing labor market and it is changing in ways that favor those with higher levels of education and higher earnings.

Some people and place are poised to do quite well and navigate well the winds of automation and globalization, and others less so. And low-wage workers risk becoming collateral damage in this scenario, unable to or struggling to find their footing in the labor market, as well as a higher ed system or education system in general that is riddled with inequities. So we call this research realism about re-skilling because it is a perennially popular recommendation to go to school, get new skills, that's your movement up. And there's a reason that's an evergreen, because it is really hard to overstate the importance of education in the labor market. And I have myself written many, many recommendations related to this.

But we need to be realistic about what we can and should expect. Education does not equal job creation. If there is a lack of labor demand in a given area, job training won't do a whole lot. And we also need to make sure we do it well. Marcela and the pane will have more to say about that.

But before I continue I would like to say a few thank yous. First of all, I would like to thank Google.org for supporting this organization, and Andrew Dunkelman and Mahmoud Ramadan, our contacts there. I'd like to thank my colleagues, Nicole Bateman, for wading fearlessly into data and coming out with insights, and Courtney Colwell for helping us make sense of so many spreadsheets. (Laughter)

Our top line finding is that we have a lot of low-wage workers in this country -- 53 million workers earn low hourly wages. That is 44 percent of all workers. That's a striking number. And let me step back a minute and tell you how we calculated it.

The first major question is what's your threshold, what's the dividing line between which someone earns low-wages or not. We set a threshold of $15.70 an hour. We came to that by looking at the median earnings for men and taking two-thirds of that. Two-thirds of median earnings is a pretty typical approach. OECD does it, a bunch of other researchers do it.

Using male earnings increased the threshold, since men earn more than

women, but we didn't want gender inequity to affect our threshold. So we used a typical male worker as our reference point. Then we adjusted for regional cost of living, because your buying power varies greatly depending on where you're earning your money. So, for example, in the San Jose region the threshold is $19.60. In McAllen, Texas the threshold is $13.33. That means if you earn $14 an hour, your low wage in San Jose, you're not in McAllen.

The next question is who do you count as a worker. We started with everyone aged 18-64. Then we narrowed it down to anyone who had worked in the past year and was either currently employed or actively looking for work. That got us to 149 million. Then we made a bunch of judgment calls. We subtracted self-employed workers because their earnings are tricky to calculate. Because we're concerned with economically vulnerable workers, we thought a lot about how to handle students. A lot of them are -- you know, low-wages are a way station for them. But we also have a serious college completion problem in this country, and just because you are in school at one point in time does not mean you're going to finish and it does not mean there's going to be an earnings payoff.

So the groups that we excluded were all graduate students and our best estimate of "traditional undergrads", those living in dorms and who appear to be working seasonally, so 14 weeks a year or less. Which we were like, eh, that's summers and vacations. So in all we subtracted about 20 percent of workers.

To that group of 122 million we applied the wage thresholds that I mentioned, and that got us to a number of 53 million low-wage workers, and they are indeed low-wage workers. Median earnings are just above $10 an hour, median hourly earnings, and median annual earnings are just below $18,000 a year. And remember what median means, half above, half below. That means half earn below $10.22 an hour. It's not a lot of money to live on.

On the other hand, low-wage workers may not be the only earners in the household and they may not be the primary earner. So we also took a look at how these

workers faired relative to the poverty line, which takes into account family size and other earnings. And nearly half of low-wage workers are working poor. They are in working poor families earning less than 200 percent of the poverty line.

These folks are disproportionately female. Not a whole lot, a little more than half; 54 percent of low wage workers are female, compared to 49 percent of all workers. And they are also disproportionately people of color, although whites make up a slight majority of low-wage workers, at 52 percent. African Americans and Hispanics together make up about 40 percent.

And they're concentrated in a family small set of occupations. The seven largest occupational groups total -- employ 19.5 million low-wage workers and make up 37 percent of all low-wage workers. Retail sales is the largest, representing 4.5 million workers and accounting for 8 percent of all low-wage workers, information and records clerks is next at 2.3 million. This type of job is a customer service rep, a receptionist, hotel desk clerk, other types of administrative jobs. Then there are two occupations in the hospitality industry, cooks and food and beverage serving workers. And then we have building cleaners, construction trade workers, and material moving workers. If you don't know what that means I will tell you, because I looked it up. Examples are forklift drivers, warehouse workers, trash collectors, people who actually move things. So the name is actually fairly descriptive. (Laughter)

And because I am in the Metropolitan Policy Program, I have to show a map. It's just in my job description. (Laughter) Low-wage workers live all across the country, and not surprisingly, they live in especially high numbers in especially large places. A number of metropolitan areas have more than 1 million low-wage workers. The New York City region as 3.5 million, LA region 2.7, Miami 1.2, the Washington, DC region has 950,000. And then when you get down to smaller areas, you see smaller numbers. So, for instance, Fresno, California has 180,000, the Naples, Florida region has 600,000.

Another way to look at it is the size of the low-wage workforce relative to the

total workforce. And in the 300+ metropolitan areas that we looked at, low-wage workers make up between a third and two-thirds of all workers. So between 32 percent of workers to 62 percent of workers. And the places where they make up the highest share tend to be smaller places. Las Cruces, New Mexico, Jacksonville, North Carolina, both 62 percent of their workers are low wage. Yuma, Arizona 58 percent, Laredo, Texas 57 percent. The large metro areas also have high shares -- they are not being left out. Fifty-three percent of workers in the LA region are low wage, 55 percent in Miami, 45 percent in New York City.

So this group of 53 million people, that lives all across the country, is a pretty big group, to say the least. And there are a lot of different factors that shape their choices, their behaviors, and their prospects in the labor market. Just to name a few, there is age, educational attainment, whether they're in school, whether they're parenting, do they have a disability, are they male or female, what's their race or ethnicity, what occupation are they in, what kind of upward mobility does it afford, and where they live. So what this suggests is there is no one size fits all solution.

Age is a particularly powerful differentiator. Think about the life course. In the years 18-24, you're just getting started, you're moving from adolescence to adulthood, from school to work, and hopefully to financial independence. And we have 13 million young adults who are low-wage workers. In fact, the vast majority of working 18-24 year olds earn low wages. Not all of them are equally vulnerable, and we try to suss that out later on in our analysis.

And there are 30 million low-wage workers aged 25-50. These are people in their prime working years, in a stage of life in which employment is often a default expectation. And low-wage workers make up a pretty big share of this group, 40 percent. Four out of ten workers ages 25-50 earn low wages.

And there are 10 million low-wage workers age 51-64. And I'll call them older even though I don't love that term as I get older myself. So there is no clear, bright line distinguishing these different age groups from each other, but AARP membership starts at

age 50, people start retiring in their 50s and 60s. Some people don't and they stay working for years longer, and that's another topic. And at some point around here though age discrimination may show up. Physical work may become less feasible. And this also may happen younger in the prime age years, people may think I'm too old to start anew career, I'm too old to go back to school. Low-wage workers are also a big share of all workers in the 51-64 age group. One out of three are low-wage workers.

Among 18-24 year olds you see a lot of them are in school, about 35 percent. They're less likely to work full-time year-round. That could be because they're balancing work and school, it could also be because they're more likely to be unemployed and have spells of not working.

Among 25-50 years olds, 2/3rds work full-time year-round and a high share, 43 percent, have kids.

Low-wage workers age 51-64, they have pretty similar rates of working full-time year-round as prime age workers, but they're less likely to be raising children and they're more likely to report a disability of some kind.

To get a more granular sense of who low-wage workers are and their different circumstances and levels of vulnerability, we clustered them into nine groups, and we used age as foundation, using the three age categories that I just described. And on top of that, we layered educational attainment, since it has such a huge impact on employment rates, and school enrollment. So, for example, the largest group is comprised of workers age 25-50 with a high school diploma or less. Almost 15 million workers fall under that category. This group is majority male and it's racially and ethnically diverse. Almost half of them have children and more than half of them are in the working poor.

There are another 8 million 25-50 year olds with some college experience, but no degree. This group is majority female and also racially diverse, but a little bit more likely to be white, also likely to have kids, also to be in the working poor.

So then I'm not going to waltz through all of the nine clusters. Based on

these clusters then we created personas in an attempt to make this more real, because it is not a spreadsheet that makes your sandwich at the deli or changes your sheets in the hotel or makes sure that the right thing comes in and leaves the warehouse that gets sent to the store or in a box to your house.

So what we have here are some examples. I pulled out my inner novelist looking at the census data. We have Isabella, age 21; she's a front desk clerk at a hotel, combing work and school. She's a first-generation college student. There's Paul, age 53, a shipping and receiving clerk with a high school diploma and worsening arthritis that makes movement difficult. And we have Michelle, and administrative assistant, who went to school for a couple of semesters and then left.

So now let's shift from the individual to the institutional and the systemic. Local organizations, lots of organizations, many of them local, have a role to play in providing education and training, helping people find jobs, helping businesses find the workers that they need. There are workforce investment boards, there are state and local employment agencies, they run job centers, the provide some money for training, they do things like the Rhode Island gentleman did earlier today we heard from, colleges offering associate and bachelor degrees, also shorter-term training. K-12 doesn't have a major focus on employment, but at the high school level there are career and technical education programs -- and we just had a whole panel on this -- that offer linkages to the world of work, and we have community-based organization and unions. We have organizations that fund the education and training system, state and local officials among them, in addition to the Federal money that comes through the Workforce Innovation and Opportunity Act, philanthropy funds, groups, and seeks to seed innovation. And economic development organizations and employers also play a role here. No one really owns the space though, at least no one with the resources and authority.

So there are all sorts of coordination frictions, different incentives, different performance measures, timelines, funding streams. But you do see successful coordination

at the local and regional level, following the geography and the logic of local labor markets. That's why it's so useful and informative to look at data at the regional level and to think about practices at the local and regional level.

From the point of view of workers or job seekers, however, it's not exactly comforting to know that in some places these different players are getting their act together. It's a confusing landscape and it can be hard to navigate.

So next up to talk more about how workers work their way through this landscape I will ask my partner in crime, Marcela, to come back up to the stage. (Applause)

MS. ESCOBARI: Great. Thank you, Martha.

So as you started the conversations, the increased pace of this technological change is really going to affect this low-wage worker that Martha described the most. These are the people at highest risk of economic dislocation. And skilling is only one of the many policy priorities that are going to deal with that reality.

But even as we focus on re-skilling, we want to stress how hard it is for these workers that Martha described to both access and benefit from the current workforce infrastructure. Much of the existing infrastructure serves a labor matching role, which is, you know, a company needs 50 machinists and workforce development agencies are in charge of producing those in the most effective and cost-effective way. But that doesn't really deal with the deeper issues of how to help low-wage workers escape economic disparities and economic stagnation.

So our goal is to really put the worker at the center of the policy design process. And for that is that we've come up with this user journey as a framework to serve as some of the most common and often overlooked moments of friction that this worker faces when approaching the workforce development infrastructure, and not necessarily from the perspective of the organization or the company seeking talent.

So this idea of a user journey actually comes from design thinking, which you've probably heard about. Many businesses use it to design the products that we use

every day. The iPhone is the best example. And, actually it started to gain traction also in public policy. The concept is simple, but quite profound, which is that you start not from the technology or organizational constraints, but from the needs of the user. And that actually changes the questions that you ask and sometimes allows you to be a lot more creative in thinking about the solutions.

Let me give you an example of this concept in action that you've probably heard of. So between the last 10 years, from 1998 to 2008, so it's pretty recent, we had women who had accidents, who were seat belted women, who had 41 percent higher chance of having an injury during a car accident than the same seat belted male. And actually, if you looked at moderate injuries, this likelihood rose to 71 percent. And the reason, or one of the reasons, was a pretty simple design feature, that car manufacturers and makers used male dummies when optimizing the design of seatbelts and other auto safety features, making men safer than women. It was only in 2011 that female crash dummies were mandatorily introduced into vehicle safety tests.

So similarly to this example, we think that much of the workforce ecosystem is designed for college graduates, for people who are technologically savvy, and not for the low-wage worker that Martha described.

So let me just talk about a couple of these important friction points that we find in this user journey. One is entry. You know, when it comes to prompting people to seek re-skilling we cannot assume that these workers have the motivation, the information, or the tools to enter the ecosystem, which means that users will require extra work and extra help to recruit into the system.

Second, self-efficacy. And we are going to hear from David in the panel about this a lot more. But many of these workers have had a consistent negative experience with schooling. They have been told and reinforced with the message that they can't learn or can't succeed at learning. And this disempowerment is actually quite hard to reprogram. And most of organizations actually screen for this type of worker, for those that can succeed

and can complete a program with the least scaffolding possible. So in a way we're selecting for people who need it the most. Low-wage workers also require more career navigation, they require sustained support after receiving their first job, but most importantly there are other needs that are more pronounced and relatively simple to understand, but hard to implement related to these workers. They're the logistical barriers that we talked about. They need childcare, they often have long commutes, the probably have the highest opportunity cost for their time, because they are working and sometimes holding more than one job.

Seventy-five percent of postsecondary students are considered nontraditional. This means older than 24 years old, a veteran, a parent, a part-time student, full-time employee. And we need to decide both content and pedagogy that takes that into account.

I'm going to give you one example around MOOCs, and it's actually an example that comes from the Ph.D. thesis of our co-author, Mike Meeney, where he is studying these massive online courses which were supposed to be -- you know, hoped to be -- you know, expand opportunities for particularly these workers with these constraints. But they are, again, mostly primarily used by college graduates, and -- tech savvy college graduates. So over 70 percent of the current users of MOOCs are college graduates. And what is worse is that the MOOCs then optimize their teaching, now that you have a lot of data to those existing customers, reinforcing the bias to those that are already well educated.

So, again, there is good content out there in the world, but it needs to be optimized and adapt both to college graduates and for many of these workers who might have a fourth-grade literacy level.

So, we are hoping that this user journey can help in the conversations of how we realistically reach and help the low-wage worker. And in a way that can help us, you now, rethink not only a kind of workforce infrastructure, to not focus on the organizations that

are providing it, but to the people we're hoping to help.

And with that, I want to bring up to this panel many of the organizations who are dealing exactly with this worker, who understand these challenges, but who are also designing for these constraints. And with that, let me ask our panelists to join me up here.

So let me start with Gordon Jones. I will introduce them as I start. We have a great panel today. Gordon Jones is the founding dean of the College of Innovation and Design at Boise State University. And prior to that, and where I knew him, he was the managing director or the Harvard Innovation Lab.

And I wanted you to start, Gordon. You made this switch from an elite institution and decided to move to Boise. And we know that the skiing is better out there (laughter), but there are other reasons that are very much engrained to your belief of the importance of democratizing quality education.

So I want for you to tell us about the trends that you see in higher ed, but also how those trends drove you to make that personal decision.

MR. JONES: Sure. Can everybody hear me okay? All right, terrific.

So maybe just a little bit of background on the sort of idea of going from an elite selective university to a non-selective public four-year university, and then maybe a few thoughts on where I think higher ed, and certainly it integrates to my thinking.

I think the headline, first of all, from my standpoint is we in higher ed are under performing on this whole issue of up-skilling or re-skilling low-wage workers, and certainly my efforts at Boise State are one contribution to what might be ideas and/or solutions to that.

Harvard -- first of all, I was the inaugural head of what's called the Harvard Innovation Lab. It was really, in a short summary, Harvard's move to bring experiential learning to a more theory-based university. It took on a patina of things like entrepreneurship and innovation, but the long and the short of it is during that time I had the benefit of meeting well over a couple hundred universities who made the pilgrimage or

migration, depending on how you look at it (laughter), to Cambridge to hear about this thing called the Harvard Innovation Lab. What struck me was the lack of real deep conviction among leadership and others around why would they even need a Harvard Innovation Lab or the model. It was very -- it felt like some of those reasons weren't genuine. And while Harvard is special, a lot of that meeting and talking in pattern recognition for me led me to really fall passionately interested in this idea of where can we -- with today's tools and technologies, why can't we democratize access to greater economic agency, if not world class outcomes for students outside the top 100 universities.

Around that time I got a call from Boise State's president, former lieutenant governor of Illinois, who said, look, I'm very interested in trying to drive this issue of better outcomes, where do we get practical but also continue the mission of intellectual transformation. But let's not fall so in love with ourselves that we lose sight of what a public university and a public compact looks like. I've created a diploma granting college called the College of Innovation and Design, I got it approved by the State Board, but to be honest, I have no idea what it should look like, would you come out and run it.

So that was a tremendous opportunity to design a model, and the basic model of this college is rather than organize around a discipline, like most 99.9 percent of university colleges will organize, rather it's designed to be catalytic and think about where do we innovate new models, new ways in which this university community can be empowering students, improving outcomes. Which leads me to this idea really of what is driving higher ed today.

I think there are two to three trends that I think are going to be dominant in this industry for the next 10 if not 20 years. The first is affordability. I mean you've heard these statistics -- the second highest debt burden in the country is education debt. I'm watching a transition of individuals with public policy in post-World War II pushing a lot of our society to go to higher ed. It was often coupled with tremendous affordability. And yet with the mid-'90s, this rise in the cost of attendance, it's creating a much greater degree of

economic rationale decision making and universities are stuck in the middle pushing an agenda of typically more philosophically designed around intellectual transformation. An input driven model, we get you 120 credit hours and then we will invite you back for football games and hope you donate, rather than trying to marry this idea of creating affordability in a world today that also needs to design for outcome. And I guess that's my basic message, is where does a university design into its mission the idea that we need to share in the ownership of the outcome of our students, rather than purely traditional mechanisms.

So this college is designed to do that. We seek to re-imagine the way teaching, learning, and research occurs on behalf of our students so that we can identify new majors, new minors, new models for higher ed that can improve affordability.

The second trend is technology. We've sold a slurry of benefits to people over the years. We've kind of been able to get away with it. It's your learning, it's the idea that you get a network, you get a credential, and you might get a little growing up by going. And with technology today there is far the rise of substitutes and alternatives that I think are going to put a lot of pressure on those four. And we as institutions need to think hard about where we want to play and where we should play.

The last one will be lifelong learning. We've got to move out of an industrial revolution model of batching folks from 18-25. And so how are we going to think about meeting people's needs. Boise State, 24,000 students, about a third of whom are first in family to go to college. Over half are either -- actually about 60 percent are either commuters or part-time working individuals who are, by definition, commuters. So a tremendous opportunity to have impact.

And with that I will stop. But that's kind of why moving to Boise State and what we're doing.

MS. ESCOBARI: Thank you.

Let me move to David Goldberg. So, David is the CEO of CSMlearn, an adaptive learning platform which focuses on teaching high performance skills and career

development alongside numeracy and literacy. He also has a Ph.D. in molecular biology, so has had his share of schooling, and has been an entrepreneur for 25 years.

What I love about your model is that, one, it is the content and design is tailored for a broad range of users seeking to meet them where they are in numeracy, literacy, but also in these life skills and issues like self-efficacy.

Why? Why is that important? How does that relate to people being able to transition in this new world at work?

MR. GOLDBERG: Okay, hello, everyone.

Where we started was with a grant from the U.S. Department of Education to ask what seems to be a solved or simple problem, what is it that you need to succeed in school, college, work, and life. And so where we ended was with a set of different -- of the following factors. There's some key workforce math and literacy, there's the ability to use those skills to solve real world problems, there's the ability to learn new skills on your own, there's attention to detail and conscientiousness, there's persistence, self-reliance, resilience, grit, there's a desire to excel, and most importantly we decided was self-efficacy, the belief that you can succeed.

And why self-efficacy, is if you don't believe you're going to succeed, why persist? It's just going to make a bigger failure at the end. Without persistence you don't have attention to detail, learning, or problem solving, and without those you're stuck.

Now, these factors -- everyone here -- it's not like we're these genioids, right? Like these are things that all of you know are important. And yet, if you were to look at the current educational and workforce development systems, for a large fraction of people, these aren't ignored, they're actually undermined. And when you think about it from the employer's perspective as well, we think that if you were to go to an employer, all employers, any employers, and ask if we could as an educational workforce system guarantee you one thing to deliver to you, what would it be. And we think that what they would say is we want people who walk in every day with the desire to excel. I'm going to

knock it out of the ballpark. And yet remember, 75 percent of students have graduated from high school or college with a B or C average. From their point of view, the deepest most durable lesson that many of them have learned is I'm not the person who knocks it out of the ballpark.

The next thing that came up actually years later when we realized it, was something wrong in career wrong, something a lot wrong in career guidance. Now, the current system now is once or twice in your life you're going to spend tens of minutes with a career guidance counselor (laughter) and they're going to work with you -- but that's not an exaggeration, that's actually true. And what they're going to do is they want to answer one simple short-term question, are you going to college, what's your career. Okay. And the fact of the matter is that you don't need the one decision in your life of what you're doing, you need a framework with which you're going to be making decisions on a daily basis so that you can navigate the shoals of challenges and you can also take advantage of opportunities.

Now, these high-performance competencies, what we call high performance competencies, the way that they also fit into the future of work is I think we've heard pretty much everyone here today talk about how important lifelong learning is in the future of work. I think that's something all of us can agree on. But there's this idea that if only we build it, if we build the MOOC, if we create that career pathway, everyone is just going to come running for it. And we know that that's actually not true. People are scared. They don't think they can learn, in part because many of them can't learn very effectively and they don't even know what to learn. There's so much out there.

And so what we think that these high performance competencies actually represent in many ways are the skill of lifelong learning. It's a skill that we need to teach before we then push people out into the world to do it on their own.

The last thing I just want to mention is what I think is a fallacy about a lot of the ways that people are talking about the future of work. They think that there are these

skills for low-wage jobs and there are these skills for high wage jobs, and only if we put them into an IT or a welding program, they're going to jump from here to there. And that's, in our view, not the way the world should work. What we should be doing is teaching skills that are going to make people successful at any job, low-wage or high-wage. And some of those will be empowered immediately to jump into those IT and welding programs. But, in fact, if we looked at all of these people who Martha has looked at and seen their progression, it wasn't in two years through a program. It was going from front line to supervisor to first line manager. And what we need to do is we need to give people the skills to be able to take that journey through life.

So I think that's what I would say.

MS. ESCOBARI: Great. Let me just follow up with that. How do you make sure that, as we create these kinds of services and infrastructure, that there's not a stigma associated with them? The comment that you made, that this is not just for them.

MR. GOLDBERG: So that will come a little bit later, hopefully, but I'll try to get it in here.

So it turns out we've created a system to do this and there's a certificate. And one of the things that we realized very early on is any certificate that is meant for them is instantly deprecated. It's not a certificate that anybody wants. So hopefully later I'll be able to tell you a little bit more about the online program that we've developed for this, but what's very interesting about it is it's been used by adult education students with fourth grade literacy and mild learning disabilities, with struggling high school students. Other people who have taken it include the CEO of Firehouse Subs and his vice presidents and the senior vice president of manufacturing, and the Ph.D. chief engineer of a Fortune 500 manufacturer. Taking the same course. We only have one course of high performance called CSM.

And what that really tells us in a very deep way is in fact that skills that everybody needs are different, but these high-performance competencies are actually

similar for everybody and that what the trick is as a company for us is how is it that we make it so that everyone takes this. And so I'm not sure how much I should do.

MS. ESCOBARI: That's good. I'll try to --

MR. GOLDBERG: You'll try to get back, right.

MS. ESCOBARI: -- bring it back around.

But let me introduce Mary Ann Gilmer, who is vice president at Goodwill Industries, based in Roanoke, Virginia. Goodwill is a nonprofit organization that provides training and employment, and for the Goodwill that she runs it involves 31 counties in central and west Virginia and has over 25 years of experience in workforce development, and a lot of wisdom.

So, Mary Ann, I wanted to ask you, in the strategy of Goodwill you are specifically targeting this population and other disadvantaged populations. You don't turn anyone away. And I wanted to understand, how do you do that? What can you tell us in the 100-year history of Goodwill that you've learned and can wrap up in 2 or 3 minutes (laughter), that have made you so effective in catering to the needs of this group of people?

MS. GILMER: Sure. Well, so first of all, to answer the question why is Goodwill in the room, right. So we are a social enterprise and the revenues that are generated, from what you may be aware of, is our thrift stores are really funneled back into workforce development services and other services to help individuals in need. And we do that throughout the country, along with some support from local, state, regional, Federal, and private funders who invest in our work and believe that we're having an impact with low-wage workers and individuals with other needs.

So how do we do that? Well, we do meet individuals where they are when they walk in our door. And we are within each community really there to serve the community, as many other nonprofits and community-based organizations are. What I will say is that I believe it's a trust factor for folks who do not necessarily find that they are ready and trusting enough to walk in the door of a postsecondary educational institution, but they

do feel comfortable walking in the door of their local Goodwill workforce center. And so we see, as they come to us, that they really need a variety of supports, a variety of wraparound services, they need to see people like them who have achieved a vision that they've not imagined for themselves.

And so I think the role that we play is to assist individuals in identifying what their life skill needs are, providing things such as life coaching. You heard when Martha was talking about the low-wage worker and many of them, of our working poor, are in fact living in poverty and they are having a difficult time connecting to job opportunity, connecting to postsecondary skills that they need.

In Roanoke, Virginia, where I am based, it's a small city, it's around 100,000 people. Our unemployment rate is much like the Nation's at 3.4 percent. Our poverty rate is at 17 percent. So we know that individuals are working but they are not emerging from poverty, and how do they gain the supports that they need to get to that postsecondary credential.

We look at a lot of earn and learn models. So we do engage with our local apprenticeship programs to connect individuals to those opportunities. But more importantly, we're working on things such as self-efficacy and how do they then begin to vision themselves into a greater place.

So that comes with, again, the trust factor, working with individuals locally in their community to provide those services to them for the long haul, and really building on foundational skills, both academic and life skills that they need to even participate in postsecondary training.

MS. ESCOBARI: Great. Thank you.

Let me go back to Martha. I mean you've cut the data in 100 ways when we were looking at the demographics of this population. And in looking at this set of workers and given all of your experience, which one of those characteristics do you find to be most relevant and most important when thinking of barriers of entering and succeeding in this

lifelong learning trajectory?

MS. ROSS: I'm going to be weasely and say more than one. Education is a clear factor. It's both a lever for opportunity, a springboard, and at the same time it's a barrier. We have such a decentralized open system of postsecondary education that people can go find a program, find an online learning course, sign up at a community college, and go forth. But it's a confusing landscape, you may not know which is the right one for you, you may not know what quality is, and you may -- I mentioned before we have a major college completion problem in this country. I think we have to think very seriously about why institutions whose job it is to confer degrees are often not conferring degrees.

So I worry about that. More conceptually, I'm not sure education means what we think it means, or that the credentials mean what we think they mean. There's a recent report from ETS that came out last fall that found that half of millennials, or about 35 million people -- I'm sure none of them in this room -- have inadequate literacy in math. These are high school graduates in addition to those with college experience. If you were just thinking, oh, it's just those people who left high school, it's not. It is a lot of people. How can we continue in this system where we are promoting people, we are graduating people, they are moving forward, and they do not have the skills that they need?

MS. ESCOBARI: Thank you.

Gordon, back to you. At the end of the day, to convince people to enter this infrastructure, it needs to work, it needs to translate into a job. And much of the good work that you've done at Boise State is connecting what you teach to the industrial ecosystem of Boise.

So I'd love to hear how do you think about the university, college playing a role in that regional development that we talked about in the morning?

MR. JONES: Sure. I mean I do think it's imperative, certainly at the public university level, that the connectivity be there. I believe that's part of the mission if we think about what public universities were originally designed to do. And I am very concerned that

because of the investment of cost and time and the trust that people put in universities to attend, this is not an inexpensive endeavor. And so we are certainly subject -- with some of the national statistics you see, we run the risk of creating -- in the words of Peter Theil -- more victims than we are beneficiaries. And that's a concern.

We know that your first job, when we think about college graduates, often sets your career trajectory for your earnings. So that's a concern when people step into under employment to under employment. So national statistics, Department of Education, one out of two students in this country will not finish college in six years. You've heard about the debt burden. Rockefeller Foundation data, Accenture, report that one out of two college graduates report being in jobs that didn't require them to have a college degree.

So the mosaic that paints is not just specific to Boise, I think these are national issues that universities need to look in the mirror and say where do we connect with greater fidelity to the needs of our community. And employers specifically, what can we do.

And so, in Boise, the prototype, that perhaps I represent, there's a number of things. One is we've got -- I believe every student should have some form of skills and experience that have currency value in addition to the transformative experience I hope we are delivering around their intellectual prowess and ability to think critically, et cetera. So that looks like there are third-party credentialing courses I offer in my college where they are universally recognized, whether that be technology centric, like Microsoft certifications or Peoplesoft, sales force -- you go down the list, to also thinks like design thinking. I partner with IDEO to offer certifications that come with a more agile skill set for problem solving. So that's one component.

Another one is when I got there, again think about that composition of Boise State students. I've got a lot of people working part-time, full-time, not just this residential landscape where perhaps many of us in the room went. So instead of doing things like cooperative education, the purest form of that, as you leave school to do six months of full-time work, we said what's a derivative that could work for Boise, and we said well, let's come

up with what we call Work U. You get three credit hours, effectively an elective, regardless of your major. We now have I believe it's 52 employers who are taking students for 10-15 hours a week. Still coming into a classroom once a week, where they socialize what happens. So, hey, somebody saw somebody get fired today. Was it a dereliction of duty, was it insubordination. Not everybody in this classroom today saw someone get fired this week, let's go through that and socialize that. And so they're getting the internship they can put on their resume and they're also getting the ability to socialize.

Another model for our working folks, as a way of re-skilling, is we started a program called Passport to Education. We have online robust learning that can help individuals complete or earn their bachelor's degree, but we've set it at part-time with one fixed monthly rate that's 30 percent less than anybody can get a Boise State education. We've partnered with our largest credit union, Capital Education Credit Union, to make this available. It costs you $5.00 to become a member, so this is not a high barrier. And if anybody in Boise needs, I'll cough up the $5.00. But fundamentally it gets you access to not just that ability on your own time, life stage, or geography to continue your education while you're still working in whatever you're doing, at a low fixed monthly price of $425 a month. And that allows you to complete, perhaps become promotable in your organization or marketable outside your organization. And we think that's a powerful venue.

So whether it be certifications that go beyond Professor Jones, who nobody knows, but they might recognize Microsoft, to electives that get you skills and experience. Because let's face it, it's technology that's screening resumes today. You're anonymous until you're a finalist, then you can tell your story. So if you don't have that skills and experience, or you can actually step in and complete so you're re-skilled to grow or -- those are three examples that I would use.

MS. ESCOBARI: Great, great.

Mary Ann, on another question related to these in demand skills, in 2017 you made a bold move to incorporate digital skills in all of your curriculums. Why? How is

that going? What are you learning in that journey?

MS. GILMER: It's been quite a journey, made possible largely by a partnership with Google and Goodwill, who enabled us to really do some innovation and really some experimentation on how we best reach the people we serve and provide digital skills to them.

I just want to paint a picture for a minute of the individuals we're talking about here. These individuals, for example, I think of one gentleman that we serve who just emerged from incarceration. He is immediately in need of employment. He has to be working. So he becomes a low-wage worker. What's happened is he's emerged from incarceration lacking the digital skills necessary to be successful in today's workforce, and so he's not doing well on the job and perhaps he experiences multiple job turnovers. That's one example of an individual that we're trying to serve, to say, hey, you're not going to be successful unless, first of all, we reach you at a grassroots level or through local partnerships and relationships that we have. And also then what happens when you're coming in, where do we start. And it's that idea of meeting people where they are. They're not going to be able to participate in an online training course or they're not going to be able to participate in even postsecondary education at a community college level until they develop those fundamental digital skills. And so that's really where we had to start meeting people.

The same gentleman has progressed on through learning basic computer skills and gone onto earn A+ certification, cybersecurity certifications, and so on, and enter into a what would be considered a middle skill wage job. But you really have to meet them at the community level. I cannot overestimate to you or overstate to you the impact of the digital divide with people who are living in poverty. Most of the people who are 18-24 years old who are coming to us for services because they are a low-wage worker or they're unemployed, know how to use a handheld device, but don't know how to apply technology skills to real life occupations. And so somewhere we've got to meet them exactly where they

are and build on those digital skills.

We also serve very rural communities that are often isolated with very few local opportunities for education. We went and did pop ups within those local communities to teach them basic digital literacy skills. We have a huge older worker population, many of whom lack the digital skills necessary to transition into today's workforce, again teaching them how to turn on a computer, teaching them how to use operating systems. These are the people we're talking about that are low-wage workers, we're not talking about people who can just go home, turn on a computer, and take an online course.

MS. ESCOBARI: Great. Thank you.

So, David, when you talk about these high competencies, talk about self-efficacy, you know, you had me nodding, everybody in the audience, of course it's important, how do you, you know, teach empowerment, how do you -- you know, everybody wants the skills, but how do you teach them? Can you actually teach them?

MR. GOLDBERG: So what we did is we built this course called CSM. It's a self-paced online course that puts students into an authentic learning environment where artificial intelligence can personalize instruction in academic schools, how you learn, how you act, and most importantly, how you feel.

And I'll just give some very quick examples in persistence. What we do is we measure student frustration. They hit the submit key 5,000 times, they say I'm going over to Facebook for 5 minutes and then you never see them again. And so we've measured these things and then devise personalized interventions.

Another one has to do with attention to detail and the desire to excel. So what we'll do is that on CSM, on every single skill, most of which are fill in the blank questions, the only acceptable grade is 100 percent and repeated twice and repeated 2 weeks later. And we're doing it for three reasons. One is most students don't actually know what A level work is. They've never actually done it or experienced. They don't think they can do it, but yes, you can do it. And, finally, if you've never done A level work you've never

developed intrinsic motivation, and so you don't know the joy of mastery. And so we want them to all experience that.

The last one has to do with self-efficacy, and we use dozens of different techniques. I'll just sort of mention one, which is that when you learn a skill in CSM, we'll tell you that only about let's say -- and depending on the skill -- 35 percent of all 4 year college graduates could do this and 15 percent of all people in the United States could do the skill that you just did. And they're sitting there thinking like I'm struggling not because I'm stupid, but because these skills are hard for everyone. And if I only put in five minutes I'll get a fist bump because I can do things that four year college grads can't do. And it's like transformative of their self-identity of what it is that they can do.

With respect to things like the skill of lifelong career decision making, we actually created a course within CSM that teaches lessons like education and workforce are focused on jobs to get you -- credentials to get you jobs. But your career is actually built out of promotions and promotions come out of your performance, performance comes from personal and professional assets. And these are what those are. And that a lot of the conversations about purpose and career guidance actually are backwards, is purpose isn't what you look for in your job, purpose is you put into the job.

And finally that almost all career guidance in the United States today is focused on career pathways, but almost nobody in this room has followed a traditional career pathway. And we want people to know that it's okay that you take some, you know, left turns and right turns and that life is a journey and your career is a journey.

So CMS, it's this course that looks like a semester course in a high school. For you guys it's 15-25 hours. Again, it's from people of very low literacy to people with PhDs all taking the same course. And I think that in general, as you sort of gave the idea, is that there's this general sense that these things are hard to teach, and I think that at least we provide a demonstration that this is a possible way of doing scalable educational technology to deal with these high-performance competencies.

MS. ESCOBARI: Thank you.

You know, I actually used what I learned form you with my seventh grader. He showed me a math problem that I couldn't do, so I told him, you know, Nico, a college graduate couldn't do this. And I don't know if I was right, but it made me feel better (laughter) because I --

MR. GOLDBERG: Well, one college graduate couldn't do it. We know that. (Laughter)

MS. ESCOBARI: All right, as you guys get ready to think about questions for this great panel, let me end with a question for everyone, but starting with Martha. Martha gets to take her time. Each of you needs to give me one recommendation.

The question is, what is it that you think if you had to choose kind of a system wide recommendation to deal with this challenge, what would it be?

MS. ROSS: I would say we need to look at our resources and our practices. We know what the fundamentals of good job training are. It is you offer education, training, and skill building that is aligned with local needs, and you work on it with regional employers to make sure that you understand things and you're not just looking at data. You provide guidance, counseling, and support to your students and job seekers that matches their needs. We know this; we do not have funding streams or programs set up to allow us to do it well.

So what we need is we need -- a lot of this comes down to patient capital and capacity building for the organizations we want to put at the center of this. But in order to provide good, relevant job training, you need to know your local economy, which means -- you can't get that just from looking at some labor market stats. You have to have people whose job it is to talk to employers, to understand industry trends. And while your person is doing that, it is hard also to get some immediate job placement number. That's why you need the patient capital. And you need to reach people with low literacy and math skills, which is possible and hard, especially if what you need is to have some job placement stats

in the near-term, because it may take a while to get someone at a fourth grade reading level to be able to fully understand the tenth grade level text book to become a medical assistant.

Then we need to have sufficient staff who are trained to things like life coaching is wonderful, to provide guidance, mentoring, and support, and we need to have money for financial emergencies that come up -- cars, medical emergencies, rent. We can do this if we could figure out how to break out of legacy system.

MS. ESCOBARI: Thank you.

David. One. (Laughter)

MR. GOLDBERG: So I'll try to do this quickly.

In our view we're never going to solve this problem by going to a high school in Boise and a workforce development program in Atlanta and doing it program by program by program. And so the question is what's the right level at which we approach this problem. And we believe very strongly that the unit of change is a community. And I don't have time to go into it right now, but we're actually now talking to communities where the goal is to get 10 percent of the adult population 16-65 through CSM.

And what it does is that the most important part of it that hasn't really been described is, in our view, workforce is about them, and anything that is for them is deprecated. And when you get to a sufficient scale within a community and you're bringing all those resources -- any door that you go into, you can find CSM, for instance, in that community. At that point it's then a question about us and us and our children. And that's when you get mutual respect and dignity for the work that people are putting into this program.

And so that's what I would say is in our view the system way of addressing this problem.

MS. ESCOBARI: Mary Ann.

MS. GILMER: I'll piggyback on both of your ideas, I think, but it's a community convening. I think that's necessary around this issue.

And I do want to address the private sector a bit here because I think we need to recognize that we have a valuable opportunity to connect business with workers who can learn now and who can keep learning and who can keep growing when jobs are automated, jobs disappear. And it really involves everyone in the community, the workforce development boards, groups like Goodwill, the community colleges, the private sector, tools and resources, such as you provide to say how are we going to really wrap around these individuals while they prepare for work, while they have the opportunity, and once they're on the job. I think we have an example of doing that in our community with partnership with the community colleges and partnership with other human service agencies and economic development to say how can we connect individuals, improve their credential attainment rate from 37 percent to 70 percent. But it involves really a true convening. And whoever that convener may be, it's going to be different from community to community, but everything has to be brought together around those individuals.

MS. ESCOBARI: Gordon.

MR. JONES: I mean I would share some of the sentiments of the panel. I think I would add, specifically for those of you in the room that are in public policy or the philanthropy community, please don't either give up on higher ed, or for that matter accept the status quo. I think of three things of -- my one thing is three parts, but I would just say think about accountability. Where can we ask for outcomes and accountability that speaks in terms of outcomes?

Secondly where can you gain insight or nurture experiments and affordability? There are so many different interesting models that I think of that could be driving the cost curve down, not up, and I don't believe there has to be a sacrifice in that outcome.

And I think thirdly where can you invest? There are innovative models in talent leadership recruitment into higher ed. I do not believe that the talent necessary to navigate these forces that are impacting higher ed is going to be borne out of individuals

who've steeped many, many decades in a model that is not designed to meet naturally, I would argue, the challenges of tomorrow. And there is some interesting work out of ASU, Georgetown, that -- please, for those of you in those areas, I'd call out those three areas.

MS. ESCOBARI: All right. Thank you.

And now we'll open it up to questions. We'll take two or three. The first one over there. Do we have microphones? Yes, we do.

MS. HEGEWISCH: Hello, my name is Ariane Hegewisch from Institute for Women's Policy Research. And my colleagues focus on the role of childcare and children in college completion. And people here probably know that 8 percent of parents and student complete in 6 years, so really bad.

So I am asking you about the role of childcare, because even if you have self-efficacy, you still don't have children. You still need time. And how you see -- could childcare have a channeling role to provide some of the services on guidance and on bidding community as well as obviously making it possible for people to spend time on learning?

But, anyway, that whole area.

MS. ESCOBARI: Thank you. Other questions? Back there.

SPEAKER: Hi, thank you so much for this panel.

I think you've all kind of addressed this, but maybe talk specifically about how wage stagnation and under employment would possible undermine this great work that we're doing. If this student goes through all of the right, you know, paths and completes all of this work, but is still not getting the money and the wages that they need. Can you talk maybe specifically more about that?

MS. ESCOBARI: One more. We had one more here or over there. We're making you run. (Laughter)

SPEAKER: Hi, Sara Gretczko from MasterCard.

I have a question about how ethics comes into play in any of these

initiatives. And I'll give you an example that we're dealing with. We're working very closely with a high school in the Bronx on building a pipeline of cybersecurity students and then eventually employees. And what we're finding in a lot of these STEM fields, including cybersecurity, is when you teach folks about things like cybersecurity, that can very easily be used for bad just like it can for good. And so just curious how you bake in that layer of ethics into these programs.

MS. ESCOBARI: Whichever you'd like to take.

MS. ROSS: I'd like to take the childcare. (Laughter)

MS. ESCOBARI: Go for it.

MS. GILMER: No, I'd say three things about childcare. And you're quite correct that it is such significant barrier to education.

First, I say public policy. So much of what we hear is that individuals who are perhaps receiving TANF benefits cannot gain access to childcare dollars for training. They can gain it for childcare dollars for work. And I think we have to continue the conversation about how necessary those resources are to people who are attempting to gain access to more skills.

The second thing I would say is creation of peer networks and supportive relationships. And that's often where organizations, such as my own, come into play in creating peer networks for people who are upscaling so that they can share in children responsibilities and also can develop the positive social supports that they need to address some of the issues they're going to encounter in balancing childcare and upscaling.

And then the third thing I would say is there has to be a connection to some of the online opportunities that are available for those individuals to study and to learn at home and while they're receiving support, such as virtual tutoring, virtual life coaching, and things of that nature as well.

MR. GOLDBERG: Yeah, so I mean the way -- wage stagnation, that's a global problem and it's hard to tackle directly, but ultimately what we have to do is put more

value into the workers. And so I mean, you know, at CSM what I didn't mention is you can actually get college math credit for taking CSM. Furthermore, that it's now being put into the credentialing pathways of the construction, energy, restaurant, and lodging industries.

And so at some level you have to think of this in a very practical way. It's not just skills, it has to be marketable skills and they have to be skills that are knowingly valuable to the employers who you're trying to reach. And so we need to have the case where everyone -- where the tide is raising all the boats. And so I don't think anything that we do directly addresses wage stagnation, but it's a necessary prerequisite to solving that problem over a period of time.

MS. ESCOBARI: By default do you want to take cybersecurity? (Laughter)

MR. JONES: Sure. I'm not sure I'm an expert, but what I would say is I think the example I think of at Boise State is I have a major that's called gaming interactive media, and mobile technology. It's an emerging area using virtual and augmented reality to create games for industry application. And the long and the short of it is that environment of multiple years or iterations where faculty can come around students, think about the same thing you described, teaching the skills in the absence of context or in the absence of ethics, or showing them more positive application can occur, is I think a great starting point, but recognizing gaming -- our problem might be students who do things in pornography or in the sex industry, where people talk about VR and AR having immediate monetization, sadly, work in that, become exploitative and where is that unnecessary.

So a lot of those students are doing projects. In our coursework they'll have multiple projects that are designed for -- for lack of a better word -- healthier application. So to be sort of hitting your question head on, I would ask back, have you thought about designing the cybersecurity to include these things that sit around side it? If the partnership is there to encourage the development of those skills that could be applied to a services industry, how can we make sure it comes with either experience or learning that sits adjacent to that? So we create the whole cybersecurity person, or a greater whole person.

It's the best I can come up with, but certainly something I think about.

MS. ESCOBARI: Pretty good for a hard question. (Laughter)

So you can now accost these people in the reception because we are going to move to the next part of our day. So don't move, at least not vertically. You can move up and down -- no, that's vertically -- horizontally (laughter), because I'm going to invite Jim back onto the stage who is going to lead us to a stellar ending to this day, as he did with the stellar start.

So thank you so much and thank you to our panel. (Applause)

MR. SHELTON: So please don't move horizontally, but do move vertically. Stand up, but promise you'll sit back down. (Laughter)

SESSION 5

MR. SHELTON: All righty; good afternoon. Oh, we've got to do this again? One more time -- good afternoon.

GROUP: Good afternoon.

MR. SHELTON: I am here to close out the day. I heard it was going to stellar out; we'll see what we can do. But I think that I have the benefit of closing out the day -- how many of you have ever met anyone who won the lottery? You have today. (Laughter)

Now, Stephen Moret is the President and CEO of the Virginia Economic Development Partnership. He is the architect of the proposal and the strategy that actually got Amazon to choose Virginia for HQ2. So, a little more skill than luck but, you know, it's still a lottery, right.

So there's a bunch that we want to talk about. I think there's definitely lessons learned both from your history and the work you just did to bring Amazon to Virginia; but it'd be great to give people a sense of the competition itself; some of the strategies you saw others pursue; and why you decided to pursue the strategy you did.

MR. MORET: Sure. Well, first of all, great to be here at Brookings. When we got the RFP back in September of 2017, what was obvious to us -- and I guess everyone

else in the world -- was that it was the biggest economic development opportunity in history, at least from a private sector or a competitive project orientation. It was just an enormous opportunity; and we had a sense very quickly that many, many other metro areas -- as it turned out about 237 others -- were going to put forth their best case for this, not just in terms of how they told the story but the kinds of economic offers that they would make to the company.

If you don't know Virginia, we're a state that is fiscally very conservative, and I knew early on we were going to see some other states make some really enormous offers for the project from an incentives perspective that we just, politically, was not going to work in Virginia. And additionally, we had many, many high-quality tech firms already there; so we didn't want them to feel like they were playing second fiddle. So, what we decided to do was certainly offer a competitive incentive offer, but to really lead with what I think Marcela Escobari would call a capabilities-based approach.

And, ultimately, the center piece of our package -- which most people, actually, don't know even to this day -- is an enormous investment in our tech talent pipeline. Roughly $1.1 billion of new state investment in our public colleges, universities across Virginia -- as well as K-12 and our community colleges -- to really more than double the pipeline of graduates in computer science and related fields. That was really the centerpiece of our package; and as far as we know, vastly bigger investment in that space than any other location.

We also thought about what are the things that we need to do as a region to really position, not just that Amazon be successful, but other companies as well. And so, there were large investments in affordable housing; hundreds of millions of dollars invested in multi-middle infrastructure projects as well.

We certainly didn't know at the beginning how competitive we would be. Clearly, if they were going to choose locations based on the size of the offers, we were not going to win that competition; but, ultimately, it worked. And what we're especially excited

about is that the investments that we're making in higher education are not just going to benefit Amazon, they're going to benefit thousands of tech companies across the Commonwealth.

MR. SHELTON: So, how did you come to learn that the talent piece was actually the piece that was a big driver for them; and what did they say about it?

MR. MORET: You know, I had been involved in economic development, I guess about 15 years at that point, and had worked with, you know, many, many tech companies; and for approximately 99 percent of tech firms the number one thing by far is talent. I mean that is the biggest thing. There're probably a few other things that matter, but they relate to that. So, we had a feeling that would be the biggest factor.

We also had a couple of conversations with them early on; and, I think, they even articulated in the RFP itself that they were especially concerned about occupations like software development engineering; machine learning, artificial intelligence, UI/UX design. We also knew coming out of our own strategic planning process that those were areas that we were already growing in that we wanted to grow more, and that the biggest enabler or constrain of our growth would really be that tech talent pipeline. So that this was really an opportunity to not only meet Amazon's needs but to better enable the growth of our entire tech sector.

But they talked about it -- we knew from many, many other companies we had talked to we already had a gap in talent -- in tech talent particularly, like basically the whole world -- and we needed to do something to address that as well as to create a better environment for them.

MR. SHELTON: You were balancing this desire to actually create assets to be valuable to your entire community but at the same time you did some really specific tailoring to the needs of Amazon. You want to talk a little bit about the homework you did to try and figure out how to do that?

MR. MORET: Yeah. One of the interesting things we really took advantage

of was social media data. Amazon had told us that, you know, the best proxy for HQ2 in terms of the mix of jobs and occupations would be -- in fact, their existing headquarters in Seattle -- that still is, by the way, their expectation -- and so, we analyzed substantially all of the LinkedIn profiles of HQ1 -- the Seattle workforce. What we found there is if you -- you've got roughly half the jobs that are sort of typical headquarters' jobs -- marketing, HR, accounting, and so forth; and finance -- and half really those tech occupations. And if you look at the tech occupations -- that was the space they were the most concerned about -- literally half of all the people at Amazon Seattle headquarters that are working in some kind of tech occupation, half of them have at least one degree in computer science. So, that was a really big data point for us; and that really shaped a lot of how we built our package.

In fact, if you look at the U.S. as a whole, and you look at jobs like software development engineering -- like computer programming -- you know, 40 to 50 percent of all the folks in those positions have a degree in computer science and everything else is, you know, low single digits after maybe computer engineering. So, that really helped shape that strategy; and we felt like that would be successful.

We were also, of course, interviewing many of our other existing tech companies -- particularly those here in the D.C. Metro area -- and they were talking about, you know, a need for that same kind of talent also.

MR. SHELTON: Got it. Now, you talking about the work you did in Virginia and the strategy that you used, but you mentioned before you've been it for 15 years; you had a couple of dry runs at this -- one in particular, Louisiana. You want to talk about that prior experience and what you brought with you?

MR. MORET: Yeah. I was actually reflecting on -- many years ago -- or not that many years ago -- I was secretary of economic development in Louisiana. You all heard today about a really important and fascinating new piece of research that Marcela and others at Brookings have put out, and it made me think a lot about the work that I did there; and a lot of it was about how do you take the capabilities that you currently have and

develop sort of into adjacent industry sectors, and what are the things you need to do to build that.

Well, when I was in Louisiana, we realized that our traditional growth engines of the Louisiana economy were not going to be the growth engines of the future. Almost all of them were expected to experience either sluggish or negative growth -- petro chem industry, and so forth. So, we had this aspiration to really get into the tech sector in a meaningful way. It was a little bit of an audacious goal at the time; and in talking with many of the tech companies -- you know, again, talent, talent, talent -- so we had come up with this idea of how do we sort of combine incentives that could sort of help reduce the risk and the cost of getting started with these significant investments in higher education programs that are relevant to those companies.

We initially did it for IBM in Baton Rouge. We made a -- I think it was a $15 million investment in LSU -- and then right after that, back-to-back, CGI, you know, GE Capital and other IBM centers -- CSC, all did basically the same thing. And in every case we made a significant investment in, basically, computer science programs in the nearby universities. The companies loved it; the communities loved it; the public officials loved it. Incidentally, one of the things that enabled us -- so, that was, in fact, a pilot or a prototype -- if you will -- and we looked at could we do this on a much bigger scale in Virginia; and, obviously, that worked well.

The other thing that was really great about how this worked out is if you think about college graduates, they're highly mobile, right. Really, there's very little connection between where they get their education and where they end up working, even at the state level. And so, we realized, hey, if we do this, we could do this not just in Northern Virginia, we could actually do this statewide and really benefit all the tech companies across the Commonwealth. So, one of the things that really gave us -- I think a much better acceptance of the project when it was announced, compared to New York -- there were many reasons it was different -- but one of the reasons was there was significant benefits for

higher education across Virginia, and for all the tech employers across Virginia as well. But we learned a lot. We learned a lot in those Louisiana experiences that, really, we were able to draw from in our HQ2 bid.

MR. SHELTON: So, two quick things. One is now that you did the statewide play -- you got a $1.1 billion investment in higher education in the state -- have you heard about other states that were kind of planning to do that if they got Amazon; and now that they didn't get it, they still think it's a good idea?

MR. MORET: Yeah. We're not aware of any that did it at that scale. I think a large number of places included some kind of workforce development or higher education component, but all the ones that we've seen were -- you know, at least in order of magnitude smaller -- I don't think anyone did something quite this ambitious. I don't think (inaudible) we would have been comfortable doing something that ambitious had I not sort of had an opportunity to experiment a little bit with it before.

We were also very, very fortunate that a number of our university leaders and our state higher education board got involved early on and really helped us to build out that model. In fact, one of the most encouraging things in the whole process was when we were down to the last few weeks; we didn't know if we were going to win, but we were pretty sure we were in the top five or so; our state leader said, you know what, if we don't win this, we should do this anyway.

By the way, actually, funny -- another story that hasn't been told -- the whole tech talent pipeline initiative and the idea of this innovation campus in Northern Virginia -- these are two ideas that have been fleshed out in our strategic plan that we were wrapping up when we got the Amazon RFP. And I remember going to our board, and I think everybody thought there's no way we're going to get hundreds of millions of dollars to do this, right; and then all of a sudden we got this new source of billions of dollars in state tax revenue, and it really helped to get it done.

MR. SHELTON: What do they say; luck is when preparation meets

opportunity.

MR. MORET: Yes; exactly. No question a combination, I would say.

MR. SHELTON: Did you take a hard look at the regional benefits?

MR. MORET: We did. I mean, you know, I mentioned we were working our strategic plan. There were two big themes that came out of that when you look at Virginia. The biggest sort of long-term economic driver of Virginia's growth has been its connection to the Federal Government. You know, a huge source -- not just direct government jobs -- but the federal defense contractors, and so forth, as well. But the challenge that comes along with that is we were much too concentrated in the Federal Government as a sector.

Secondly, we had realized that our biggest traded sector growth opportunity for the Commonwealth was tech -- you know, broadly defined, software development, cybersecurity, data centers, and so forth; and that the biggest constraint to enable to that growth would be the tech talent pipeline. So, when we got this Amazon RFP, we literally were in the final, you know, week or two of wrapping up the strategic plan and realized that all of this could kind of work together in a really synergistic way.

So, we looked at regional benefits; we looked at the impact on direct jobs; we looked at indirect jobs; we looked at the experience in Seattle, in terms of the catalyst that Amazon has been for venture capital, for sort of spin-off companies that have come out of Amazon as a result of that. We looked also, of course, at, you know, where people actually are going to live -- you know, all the benefit wouldn't necessarily come to Virginia -- a lot of the folks are going to live in D.C. and Maryland. So, there are some regional benefits from that perspective.

And the thing that we really put the most energy into other than the tech talent pipeline was the multi-middle transportation infrastructure; and we had help from our local, regional, and state partners really model out the sites and identify what are the additional infrastructure investments that are needed to make this work. So, there're two new Metro entrances; there's a new really cool pedestrian bridge that's going to go to

Reagan Airport; and some other things that we were able to build in on top of the existing $15 billion worth of planned multi-middle projects in the region already underway.

MR. SHELTON: It's almost like he took a systemic view of it thinking about both the individuals and the economic environment and built an environment around them. You guys don't remember the beginning of the day? (Laughter) Anyway, it sounds brilliant.

Let's talk about the folks who are locked outside of the economic pathways today and whether or not they would have wound up in low wage jobs or whether they're going to have the skills for the kind of jobs at Amazon. Are you creating new pathways for people who would not have opportunity at all; are these people who are going to get upgraded jobs? Like what's the source and what kind is going to be the benefit for the folks that participate?

MR. MORET: Sure. Well, first of all, I think, bear in mind one of the reasons we are motivated to do this is that the D.C. Metro economy -- particularly at the time that this was happening in late 2017 -- it had five years of really significant underperformance. So, you had not just a lack of inclusive growth, but a lack of growth in general, compared to our peers around the country. This is going to be a big catalyst for improving that.

As we put the tech talent pipeline initiative together, certainly most of the investment is going at the four-year level, but we do have significant new investments in K-12 and we're one of the first states in the country that has a computer science incorporated as part of the required standards of learning in the K through 12 environment. We're roughly quadrupling the state investment we're making in the existing state investment in professional development and online curricula that will support those folks.

As everybody, I think, in this room knows, if we want more folks to go into tech -- I mean post-secondary is just one piece -- but if kids don't finish high school with the basic skill sets and some sense that may be something that they're interested in, it's very hard to get, you know, more folks to go that way. So, that's another factor.

At the community college level, we've seen a great partnership between Northern Virginia Community College and George Mason. In this region, they're creating new programs that will be terminal degree or certificate opportunities at the sub-baccalaureate level that will also feed into not just Amazon but these other tech companies as well.

So, there's a lot more that needs to be done; and, certainly, we are a bit -- you know, you could argue -- a little over weighted on the bachelor's and above, but that's just because so much of the demand is there right now. But we are looking at ways to build the K-12 pipeline as well. There's also new funding for internships at the post-secondary level to help students get into those career pathways.

MR. SHELTON: Is there anything that was surprising to you about the challenges of getting the systems, and the employers, in particular -- you kind of got the employer input and took it to them -- was there anything surprising about how easy or hard it was to get the systems to begin to line up with what employers actually want?

MR. MORET: It's a great question. One of the things -- everybody in this room either should know this or already does know this, right -- one of the ironic things about -- we talk about the importance of higher education to the labor market and to business, but like the vast majority of all of the money that's invested in higher education is not targeted in any way whatsoever -- I mean, zero; right -- particularly the four-year level.

In fact, one of the reasons that our institutions are not more responsive to the market demand is that very often the programs that are most needed, that are the most under supplied, if you will, are higher cost programs. So, the institutions need some way to deal with that incremental cost, right.

A lot of what we're doing with this tech talent initiative is we're funding them at a higher cost per student to account for a higher cost of faculty; the higher cost of start-up packages, and all that. So, the institutions, I think, once they realize that we were going to give them a way in their sort of fiscal setup to be able to actually deliver, they were very

enthusiastic.

But when you look across the country -- I don't know the exact percentages; but I think it's certainly fair to say the vast majority of states do not have funding models that reflect the different costs of different types of programs. So, a lot of the misalignment that is happening is simply presidents of community colleges and universities that are having to meet their budgets, right; and so, if you don't have the money to be able to afford the higher cost program, you're not going to deliver it.

We found that when we talked about bringing real resources to the table, across the board they were super responsive to that. We're actually going through the process right now of negotiating MOUs with each institution that'll lay out their specific participation. This is going to be a performance-based program; but we are providing dollars in the new faculty lines.

MR. SHELTON: Say more about that.

MR. MORET: Yes; so, one of the things that's really important to the general assembly -- the legislature in Virginia -- was that, you know, if we're targeting this outcome of, you know, roughly doubling the number of grads per year -- it'll be another, give or take about 30,000 additional bachelors and master grads in computer science-related fields over the next two decades in excess of what we're currently on track to produce -- they wanted to make sure we would actually get those outcomes. So, we are actually going through a competitive process right now where all of our -- I should say the vast majority of our four-year public colleges and universities, as well as our community college system -- have proposed the level at which they would like to participate in this program.

We've kind of got a standard way by which they can lay out. You know, we need this many faculty lines, startup packages, etc.; and we will, ultimately, negotiate an agreement with each institution. Initially, they'll be funded based on the projected, you know, costs; and then, you know, four years later once we start getting incremental growth in graduates, the sustaining funds would be based on their actual performance. It's certainly

been done before; but I don't think it's been done before at that scale.

MR. SHELTON: Got it. And -- jumping around just a little bit -- do you expect, based on what we've talked about in terms of the new pathways that you've created even down to the secondary school that there's going to be a shift in the demographics of those participating in these pathways?

MR. MORET: I think so. You know, one of the things -- it's funny when we actually included our pitch to Amazon -- it hasn't been talked a lot about publicly -- but one of the things Amazon was really interested in was inclusion. And we talked about how the tech talent in Northern Virginia and the D.C. Metro is vastly more diverse than in Silicon Valley. I forget the numbers off the top of my head, but far, far greater diversity. It's also a place that Raj Chetty has looked at as one of the best enablers of economic mobility. When you look at Northern Virginia -- those localities like Arlington, Alexandria, Fairfax, Loudon, and so forth -- at least the average across them -- are among the best economic mobility drivers in the country. And a lot of it has to do with having great public education options at both the K-12 level, you know, and beyond.

MR. SHELTON: On the same note, affordability is one of the big barriers to access in general. Did you guys look at any innovative strategies for financial aid, financial access, other points of access?

MR. MORET: We did. Now, bear in mind we had to put this all together in six weeks from, you know, full stop.

MR. SHELTON: It seems to me you got everything else in there. (Laughter).

MR. MORET: And by the way, you know, our deal that we actually, ultimately executed was almost identical to what we put together in our round one proposal. The only thing we changed was we, essentially, cut the incentives roughly in half; you know, when the number of jobs went down.

But in working with our universities, one of the things that they are

committed to is to try and to attract a diverse group of students into these programs. So, literally, we're going through the proposals right now; but I know, for example, Virginia Tech has laid out a significant amount of the new dollars. They're going to go to financial aid to ensure that they can get a higher level of diversity in computer science and related fields than they historically have had. I can't say that'll be the case across the board; but, certainly, I think many of our schools are going to be targeting that as part of their package.

MR. SHELTON: Are there any experimentation with things like income sharing agreements or things like that that might open up the window?

MR. MORET: I personally think that's really interesting. I don't believe any of the universities have included that as part of their proposal though.

MR. SHELTON: All right; I was just curious. So, you now have a framework in place for all the colleges; you're going to have Amazon, you know, in a couple of years really starting to drive the demand; but you have all these other employers that have been kind of waiting for the opportunity to piggyback on what you've got so far. What is the concern and what is the opportunity that the existing employers currently feel about the deal that you cut?

MR. MORET: You know, that's a great question. So, when we were putting sort of the fine points on this about a year ago getting ready for Amazon's sort of round one visit -- when we got down to the 20 -- we interviewed many of our tech employers in Northern Virginia -- from large companies down to startups. We posed many questions to them; but one of the most interesting ones was -- for me, at least -- was what would it mean for your company if HQ2 came to Northern Virginia? And so many of the folks were worried they were going to be -- you know, they were going to be concerned about it. But the dominant perspective was it will be more competition certainly in the short run, but in the long run we're going to have a bigger, more vibrant, more diverse tech talent market, right.

I remember back when I was in Louisiana I used to go to Silicon Valley once or twice a year trying to recruit companies to move out of that "bad" business climate in

California, and how many executives did I have tell me, you know, I'd move my company tomorrow if I could get all these people to follow me, right. I mean if you have the talent, you've got everything in the tech talent space.

MR. SHELTON: Got it. I've asked you about a couple of surprises in the process. Is there something that happened during the process that no one ever asked about and you were surprised?

MR. MORET: That I was surprised that they didn't ask about it?

MR. SHELTON: Yeah.

MR. MORET: Gosh, that's such a good question. It's kind of a blur looking back on it. I can't think of anything off the top of my head.

MR. SHELTON: I'll let you ponder that one. Okay. So, the models that you heard about --

MR. MORET: I will say there's actually one thing that's really important, and Brookings has directly or indirectly written a lot about this through the Brookings Metro program. The thing that we were actually the most worried about from the beginning -- I would say all the way up until a couple of days before the announcement -- was costs, right. I mean one of Amazon's leadership principles is frugality, right. And when you rack and stack all the metros across the country, we were less expensive than New York, maybe, and Silicon Valley, but higher than almost everybody else. And it turns out that if you have a big metro with a high level of education attainment; and, you know, this area's off the charts, among the very highest in the country, that, you know, the productivity and the innovation capacity is so great that it basically offsets that sort of nominal high cost of labor and of real estate, and so forth.

That was something we were worried about the whole way. I was hoping that -- many of you have read this great book, *The New Geography of Jobs* by Enrico Moretti. Early last year, I was visiting with a senior executive of Amazon -- who will go unnamed, but let's say a very senior executive, not Bezos, but someone who works close

with him -- and this person said -- I'd asked him what do you think of the tech talent in the Northern Virginia, D.C. Metro area. The meeting was not about HQ2. We weren't supposed to talk about HQ2, but I asked him this question. And I felt like we were in the right direction when he said, you know, I'll answer your question, but I wonder if you've ever heard of this book, *The New Geography of Jobs*. He said our (inaudible) team has read this book and it's influenced how we think about where talent is developed, how we develop talent. And a big theme of that book by Enrico Moretti was really about sort of these magical properties of metro areas, and that when you put together large numbers of highly educated people, all these really cool things happen. And that was probably the first time that I thought okay, we may be able to overcome that cost issue at the end of the day.

MR. SHELTON: Awesome. So, I'm going to push you on that one because my next question is a lot of our conversation today has been about the communities that are kind of left behind in these conversations because they don't benefit from those agglomeration affects.

MR. MORET: Right.

MR. SHELTON: Is there any part of the proposal that's about -- you talk about how the drawing in of the universities across the state will benefit other companies -- are there any thoughts about distributing the workforce and things like that are going to be a part of the Amazon plan and that might benefit these communities that knowingly might be left out?

MR. MORET: It's not part of the Amazon plan explicitly in the sense that, you know, their commitment is to create a certain number of jobs, you know, in Northern Virginia and Arlington. But one of our initiatives at VEDP in Virginia is to cultivate what we loosely call rural and small metro technology centers. Certainly, most of the tech gravity in the country is going to the "super star" cities; but there are a lot of tech jobs in smaller metros, and even in some rural areas. Look at companies like SAIC; like CGI; IBM, to an extent; Piller, for example that are doing some interesting things; and so, we really saw this

tech talent initiative because we're going to do it all across the state as a way to build the pipeline of talent that we would need to attract more tech jobs to these smaller communities.

The other thing that came out of it -- while it was not, specifically, part of our HQ2 pitch -- clearly one of the biggest challenges facing rural America is a lack of digital connectivity -- a lack of broadband access. And that had been percolating in Virginia for a number of years. It was in our strategic plan as a top priority; but I think one of the things that happened -- I personally believe as a result of Amazon, or at least largely sparked by Amazon -- was that the rural and smaller metro parts to the state were kind of saying hey, this is great for Northern Virginia, but broadband access would really help us in the other parts of Virginia; and we were big cheerleaders for that.

And with the governor's leadership and the general assembly support, I think they roughly quadrupled the number of dollars that are going into broadband deployment basically to help subside service in areas that otherwise would not get service or wouldn't get it for a long time; and we now can talk about for the first time in Virginia being on a path toward ubiquitous broadband access over the next 7 to 10 years. And that, I think, was a partial outcome -- all, again, not explicitly tied to it, but I think something that was really sparked in some ways by it.

MR. SHELTON: Now, you talk about there's coming a point in the process though where, you know, talk is cheap -- okay, we're like, even if we don't get Amazon, we should just keep going.

MR. MORET: Yeah.

MR. SHELTON: Is there something in particular that was a trigger that got people to kind of open their eyes and said, you know, Amazon is nice but our future might actually depend on this?

MR. MORET: Yeah. We did a lot of work on looking at supply and demand for tech talent. We did a lot of work in interviewing many of our top tech employers, and so as we were getting close to the finish line and really digging in with our state leaders to make

sure that they were all going to be comfortable if we ultimately got this, I think there's just a broad recognition that, you know, this is the single most important thing that we can do economically to position Virginia for growth. It is to really invest in this tech talent pipeline. Certainly, many other things matter, but this was for us really a constraint, you know, at that point in time; and it was really something that came from them.

I remember as we were talking about it, it was probably the last or second to last briefing that we had with our legislative leaders where it sort of came up that someone just sort of mentioned it -- one of the legislative leaders; and there was an apparent consensus in the room that if we don't get this, we should make these investments any way.

These are things probably that there's so many things we could all talk about every state should do them. It's like eating your vegetables, right; but until you have that moment that creates the sense of urgency, it's just hard to get people rallied around it.

And, by the way, I give Amazon great credit for that because just in our case -- and maybe indirectly -- the things that we felt like we needed to do to be successful in getting that project, were things that largely we really needed to do anyway. That was really huge for us. And then also their emphasis on regional collaboration; their concern about affordable housing; their concern about infrastructure -- it really helped. You know, last year, Virginia -- for the first time -- not for the first time, but recently -- Virginia, D.C., Maryland came together to solve the Metro financing problem. You know, not just because of Amazon but it was a great catalyst to get everybody motivated.

MR. SHELTON: Yeah, it was. (Laughter).

MR. MORET: It helped.

MR. SHELTON: We've been waiting a long time. I'm sorry; for those of you who don't know, I'm like born and raised here. So, you've been fantastic, but I've been counting yarns and we're like at 20; so, this is going to be my last question. Now that the Amazon card is played and you've got this infrastructure in place; and you heard the kind of tools that Marcela has created, what do you think the right next play is for you guys?

MR. MORET: Well, one of our great aspirations is to position every region of Virginia to grow. They're not all going to grow at the same rate, obviously; but positioning every region to grow; and that's why I think the new research out today on the economic complexity index, and looking at ways to leverage a capabilities-based economic development strategy, and do it in a really thoughtful way, I think you're going to be seeing us doing a number of things in that direction.

MR. SHELTON: Fantastic. Well, Stephen, first of all, I wanted to say thank you for your time on the panel, but as a person who was born and raised in this region, I want to thank you for the job that you did to get Amazon to come to town.

MR. MORET: With 500 other people, by the way. It was a big team.

MR. SHELTON: Absolutely. And with that, I'd ask everyone to say thank you very much. (Applause). I'm ending approximately 10 minutes early; so, I'm hoping the drinks are actually ready. Are we good? Okay. And with that -- everybody closing up -- well, then we're good. Have a good time. Thank you for coming today.

* * * * *

CERTIFICATE OF NOTARY PUBLIC

I, Carleton J. Anderson, III do hereby certify that the forgoing electronic file when originally transmitted was reduced to text at my direction; that said transcript is a true record of the proceedings therein referenced; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were taken; and, furthermore, that I am neither a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Carleton J. Anderson, III

(Signature and Seal on File)

Notary Public in and for the Commonwealth of Virginia

Commission No. 351998

Expires: November 30, 2020