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SKILLS FOR A CHANGING WORLD

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Opening Presentation: Skills for a Changing World:

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Presentation:

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Breadth of Skills in Regional Networks:

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What are These Skills? Differences Between Skills, Knowledge, Attitudes, and Values -- and Why They Matter:

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Report Launch: "Skills for a Changing World: National Perspectives and Global Movements":

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Reflections and Perspectives on the Report From National Education Officials:

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Breadth of Skills: Examples and Initiatives:

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P R O C E E D I N G S

MS. WINTHROP: Good morning everybody. Wonderful to see you; there's a few seats at the front if people are looking for places to sit. So happy to have everyone here, many new faces, many old friends, thank you for joining us this nice, sunny, warm spring day.

I'm Rebecca Winthrop. I'm the director of the Center for Universal Education here at Brookings. It's a real pleasure to welcome you to the symposium. We, every year do a Policy and Research Symposium, and focus on a different theme, and this year we are focusing on our initiative: Skills for a Changing World.

There are some seats at the front. Don't be shy. We are just getting started. People are going to sneak back all the way along the skinny part by the windows.

So, briefly: our Skills for a Changing World Initiative is really focused on the big question, and big sort of, you know, guiding star that we all care about, is how do we ensure all children have high quality learning opportunities to really build the full breadth of skills needed for a vibrant society/societies, basically in the face of rapidly-changing social, technological and economic demands?

That's sort of our name, goal, interest, point and purpose. And the initiative is supported by the LEGO Foundation. Huge thanks to our partners, the LEGO Foundation, although if you don't like anything that you hear today, you really can't blame them, because Brookings is a stickler for independence and research, so it's not their fault, it's our fault. But they've been wonderful partners, and we are really grateful to be working with them.

The Skills for a Changing World Initiative looks at many different questions. Some of what we look at looks at creating learning landscapes around learning opportunities in environment around school. Some of it looks at innovative models for rapidly-accelerating progress towards the breadth of skills.

Today what we are going to focus on is the research and work we've been doing around the world on formal education. How can formal education systems really help cultivate this full breadth of skills that we need and our children to have in the face of a rapidly-changing world?

And one of the reports that we are going to be talking about, or we are going to be unveiling is called, Skills for a Changing World National Perspectives and Global Movement, which

includes four case studies from Mexico, South Africa, Kenya and the Philippines. This dives much more deeply into this question of how you create of breadth of skills within the formal education systems.

And it also builds on existing research that you'll hear about that maps much more broadly over 110 countries, this global movement towards a breadth of skills. I'm really pleased that you are going to hear from all of the authors today, Esther Care, Helyn Kim, Kate Anderson, Emily Gustafsson-Wright, who were are all on the team and have been working heavily together on this initiative.

I also wanted to point out, that there is two other -- there is a book in the report that I think are very relevant to this topic from our sister agencies. And I just wanted to tell you a little bit about them. We have some information about them in the back, on a table in the back, if you're interested.

One is for Results for Development, which is our sister agency here in Washington, D.C., and it's a new book, and both of them are focused on secondary education. And this called "Bridging the Skills Gap: Innovations in Africa and Asia." You'll see a little flyer on it in the back, you can get much more information. But it really is looking at the secondary education system, including workforce, and how can it keep up in the face of a changing labor market, and what are those connections and linkages.

The second report, of which there are a few copies in the back, and I'm sure, you can get more of them from The MasterCard Foundation, one of the lead authors is here, and that report is called "Skills at Scale: Transferrable Skills in Secondary and Vocational Education in Africa." And this report draws on research done by the Africa Institute for Development Policy, and looks at -- particularly looks at transferrable skills, and how can countries embed transferrable skills in their secondary education, both sort of secondary school and vocational education departments.

So, I'm sure there are also other interesting reports, research that all of you have done, and if you would like to feel free to either leave copies if you brought them, on the back table. We often like to use this as a platform also to share each other's new research and findings.

So with that, I just want to say thank you, again, for coming. And I want to hand over to my colleague, Esther Care, who is a senior fellow with us at the Center for Universal Education, and a leading expert on 21st Century Skills -- and/or, now -- Breadth of Skills, her preferred term, and she is going to kick off and lead us for today's events. Over to you, Esther. (Applause)

(Video playing)

SPEAKER: In order to be successful in the coming century, students need to develop skills beyond traditional areas, such as literacy and numeracy for a broad range of skills, such as communication, creativity and critical thinking. Many countries already recognize Breadth of Skills in their vision statements, in policies, in curricula, and in specified development or progressions of these skills.

For example, nearly half of our countries and our research identified creativity as a necessary skill for students. However, there is less evidence of articulation of how these skills develop within the system, which may mean they are less evident in actual classroom practices. The Skills for a Changing World Project is exploring how countries can refine education, from national policymaking to classroom techniques, to prepare children for life learning and livelihoods.

MS. CARE: It was so good we are going to listen to it again. Fine! Good morning, everybody. And welcome. I hope you enjoyed that, it's meant to give you a little potted version of where we are and what we've been doing, and a vision for the future. And, narrated beautifully by one of our staff, Tyler Ditmore.

So, it's wonderful to see you all here, and I think I, as well as the team, have been working on this project. We are very much looking forward to your inputs during the day. We have many speakers from many different places, looking at different aspects of the work that we've been doing, and it's not so much only about presenting, of course, it's about sharing and it's wanting your inputs, understanding different perspectives.

Obviously we are trying to collect a wide range of perspectives, and it's having people from different walks of life, who can inform us, and make sure that we are on the right track. So, we've had a great couple of years, working on this: Skills for a Changing World Project. We have some fascinating findings, and as with most findings, they are raising more questions for us. So, it's like a typical process of research. It always leads us to -- not only to new discoveries but new questions.

And those questions are about what is happening in our education world, and how education systems are moving toward 21st Century aspirations for their students. So, what this is all about is it's about a shift in education toward us being a lot more explicit about the skills and the capacities that we want our students and that we want our children to develop.

So, as we all know, we are facing huge challenges in this world. We are such productive beings, and I think we have not yet learnt how to harness that productivity adaptively, and for our long-term survival. We are facing continuing conflicts globally, we are facing threats to our sustainability by the (inaudible) actions. And if we think about the Sustainable Development Goals, these are possibly our most explicit response to recognition of those issues; and the fact that we need to educate our children to act more adaptively and more sustainably than we have.

So, that's the sort the gloom bit, and I'd like to move on to something a little more optimistic from now on. So, to some specifics about the work, what I want to do is situate the discussions for the rest of the day a little bit, in a tiny bit of historic perspective

So, in the last decades of the 20th Century, there were calls from global organizations for us to rethink education, and I won't talk about all the frameworks, but just mention a couple.

The first we had UNESCO, and they proposed a vision of education as learning to do, learning to be, and learning to live together. This was the DeLors Report, out in 1996.

Then from the OECD through the last decade of last century, and through the first decade of this, the interest has been in the outputs of education, and the outputs of education extending beyond educational attainment as we might measure it in terms of years of education, or as we might measure it in terms of qualifications, thinking ahead to: what individuals know, how much they can do, and to the relationship between those capabilities, and where education is heading.

So, the OECD's position that was outlined in the DeSeCo Project around 2003 focused on the key competencies, and they classified those competencies into three broad groups. The first of these were individuals' need to be able to use a wide range of tools so that they can interact effectively with other people, as well as their environment. They need both physical tools, like information technology; and socio cultural tools, like communication. They also need to understand those tools well enough to adapt them to their own purposes.

Secondly, we need to be able to engage with others. We need to develop competencies in being able to interact with each other.

And third, individuals need to start taking responsibility for managing their own lives and situating themselves much more in the global context. So, that was out of DeSeCo.

On the screen what you can see, is a frame that's taken from Binkley et al., and Binkley et al. were academics and researchers who worked within the Assessment and Teaching of 21st Century Skills Project, and this was a project that started out in 2009. It was supported by Cisco, Intel and Microsoft, and engaged eight countries in its research over the period of its life.

And Binkley et al. identified these ways of working, tools for working, ways for thinking, and skills for living; so very, very similar to DeSeCo or the DeLors Reports. So, what we find is the frameworks that came out of global organizations were all pretty similar over that period of time, and recent work that we've done has really identified that we are still in the same space.

We've populated the middle of it here by some labels, so I often used to talk, and I still do I guess, about 21st Century skills. Here we are talking more about it in terms of a broad range of skills, a breadth of skills, and you can see other labels for them up there. And so this is the context that we are operating in.

So, at Brookings we've been interested, primarily, in the skills aspect, so 21st Century skills, of a shift in education. And we are going to discuss later in the morning, some of the issues that arise from different definitions of what skills actually are.

I want to put that aside for now, and talk a little bit about some of the data that we have. When I do talk about skills though, we are basically talking about how one can bring ones competencies to bear to adapt to new situations, that's basically what a skill is.

We are interested in looking at formal education systems. But one of the things that we really like to note is that the time that we learn -- the time that we inhabit a formal learning space is actually the smallest time that we are learning, right. We are learning much more outside of that formal learning space.

So, now to a very whitewashed look of the world here, to what we see as the global movement. So, first of all, and we've reported on this briefly last September in New York, we undertook a global mapping activity. To see how skills are appearing in policy across different countries' education systems. And the question was for us:

What does it look like at finer grain levels? What does it also look like in regions and in countries?

We need to understand what's going on in terms of the skills movement, not just what

people talk about happening. What skills are important for countries? What are the attitudes and the perceptions of key stakeholders in countries where there is a shift in the education movement?

So, I was fortunate to work with the NEQMAP Research Group, out of UNESCO Education Bureau in Bangkok, to look at the movement in the Asia-Pacific region. And Ramya Vivekanandan, here from UNESCO, will be talking a little bit about that work later this morning, as well. So that's one part of the work that we'll talk about briefly today.

And the other is the work that we've been doing in countries. And as Rebecca mentioned before, Mexico, the Philippines, South Africa and -- the other one, it's just gone out of my head, and I'm really sorry about that.

SPEAKER: Kenya and (Crosstalk)?

MS. CARE: Thank you. Okay. So, when we looked at those four countries we were taking, primarily, a qualitative approach. Here, this is data from the global mapping. And just to give you a little bit of a feeling for the particular skills that seem to come up time and time again, when we ask countries or stakeholder groups what's important. We come up with: communication, creativity, critical thinking, problem-solving, so a nice span across sort of the social areas of competency, as well across the cooperative.

If we look at the data that we drew from our mapping of over 100 countries we are interested in how we could make sense of those data, and to do that we mapped the data from each of the country across four categories and you can those here. We were looking for skills in what -- or evidence of skills in what the countries said were their missions.

So what sort of citizens did they want? Could we actually find some intimation there, of some skills? We also wanted to see, had these countries actually identified specific skills? Were they naming specific skills? We also wanted to see whether those skills were shown in the curriculum. And finally, we wanted some indication of whether there were descriptions of skills progressions, just in the same way as a traditional curriculum, where we go from basic to more sophisticated. We wanted to see if this appeared within the skills areas as well.

And in fact, that idea of having the information at the big policy level through to the learning progressions is not endorsed by the data at all, that's not how most of the countries that we were

looking at are working. And so we are quite interested in why is that happening? Why is that hypothesis not true? What are the patterns, and how different countries take on this particular shift?

So, those questions are not only about curriculum, out of our visualization mapping we get information about the curriculum. We don't, however, get information about the other two major contributors to an education system, which are the pedagogical frameworks and approaches that are taken within a system, and the assessment approaches that are taken within the system. We need all three of these major parts of education, if they are going to be any major shift in education, any major reform, we need to be looking after all three of these sides.

So, we wanted to have a little bit of an understanding of what's actually going on further down in the system. I won't talk about this at length, because I think that Ramya will talk about it a little later on this morning. This particular framework is one that comes out the NEQMAP and ERI-Network, out of the Asia-Pacific. And again you'll see that this framework is not dissimilar from the global frameworks, and it's also not dissimilar to the information we get when we go down to country level.

So, what we've been trying to do here at Brookings is look at what's happening at the global level, what's happening in different regions, and then what is happening down in particular countries. And so if we move to some of the outcomes from that work out of the Asia-Pacific, what we found were these categories of challenges. The first was around definition of skills, and just in the same way I'm saying skills now, and each of you have a different understanding of it, that's exactly what's happening out in the wider world.

And until we can get some commonality of understanding what we mean, then it makes it very difficult for education systems to make sure all of their stakeholders are on the same page, so that we can actually effect efficiently.

There were lots of operational issues, and this was across 12 countries, variously across four of the studies that UNESCO supported. And a lot of the challenges from these 12 countries in the Asia-Pacific were about how to translate that vision into action. And this is exactly where we are Brookings.

How do you go about a reform that is as big as this? Where we are actually focusing on the skills agenda in education, rather than focusing on content or knowledge, a whole lot of different

things have to shift with that, and that means that the implementation issues are huge. So, how do you provide training to shift the way teachers teach? How do you shift assessments systems that are used to having right and wrong in terms of identifying how students are doing, when we are actually much more interested in enhancing their progression through their learning?

And the systemic, a lot of cultural issues in every country about how education runs and what the whole community expects of it. So, we are going to country perspectives and this is then going to our work in Kenya, the Philippines, Mexico and South Africa, we were interested in two big questions. One of them was this one about, how do countries approach shift?

And if you recall that hypothesis I mentioned that, first of all, countries would identify the particular characteristics of value in terms of their graduating students, that that would then be reflected by the identification of skills, then that they be shown in the curriculum, and then finally that we would see evidence of intended development of the skills through knowledge about their developmental trajectories. I would say that's the basic hypothesis.

We see identification of learning progressions in pathways as the absolute intrinsic component for approaches to teaching, learning and assessment of 21st Century skills, and so we are interested in how countries have defined and describe those.

The other question here about the three factors -- I didn't click last time -- is when we look at major change, to what extent are countries addressing all three of those areas? So, as we'll hear lots of information from the countries themselves today; for example, the Philippines approached this movement initially through complete curricula reform. Since that time, the country has proceeded with development of learning progressions that help them to refine their assessment approach.

Norway, for example, has a major paper that will be mentioned later on, on integration of skills within an interdisciplinary context. So, in terms of the actual skills area, the things that we need to be thinking about are: what are these pathways to learning? And I think the key to that is around learning progressions. Understanding what the skills are. What does it look like when the child demonstrates a low level of communication? What does it look like when a child demonstrates highly-fluent, agile levels of communication?

And the other one is pathways to reform. How are countries approaching that? Are I'm

always going at it from curriculum first, are there other ways to approach that, too? So these two big questions of pathways to learning, and pathways to reform, I hope that they will stay in your mind during the day as we talk about what we have found, and as we hear from our speakers.

What we've learnt is that, globally, there's broad acknowledgement of the need for a range of skills in the use of formal education. So, as our speakers share with you their perspectives please keep this overall global movement in mind, and think about: How do we go about actual implementation? That's the big question for all of us. Thank you. (Applause)

MS. ANDERSON: Thank you. I will introduce myself. I am Kate Anderson; I'm a project director and associate fellow here at the Brookings Institution. And I'm going to invite up our panelists to talk about regional networks.

So, Esther gave a great background on the global movement. We'll hear about the country research that we've done, but kind of in the middle tying it together at the regional networks that can really help move things forward. So if I could have Darius, and Maysa, and Ramya and Mercedes, join me up here? Thank you.

As we are getting the mics working -- When we first got started doing this work, we heard a couple times, people would ask: you know, is this really something that's happening in the U.S., maybe in Europe, maybe in high-income countries, OECD countries, but, you know, around the rest of the world is this really happening, or is this something that's kind of coming from the so-called Global North, and being pushed down.

And so, I think as Esther explained, what we are really seeing that this is a truly global movement, and while some of the global organizations have had a role, it's really, at the regional level where we are seeing a lot of activity of countries learning from each other, connecting and, you know, coming up with new ways, and innovative ways of approaching the skills agenda.

So, these regional networks can help generate efficiencies when you have a group of countries that use the same language, such as in Latin America there's ways to think about this as far as learning materials, and assessment materials, that can be done together in the region. There is also, groups such as the African Union, or ADEA, the Association for the Development of Education in Africa, and it brings together ministers and government leaders that can really put pressure on countries.

Also informal networks are just bringing together several countries that are interested in an issue. So, you have the bios of our panelists, but I just want to mention a couple words about why they are joining us today.

So, first we have Maysa Jalbout, and she's the CEO, Abdulla Al Ghurair Foundation, and has done quite a bit of research on skills in the Arab world as a nonresident fellow here at Brookings, and in other roles.

Next, we have Darius Mogaka Ogutu, he is the director of education in charge of policy, partnerships in East Africa Affairs, in the Ministry of Education in Kenya. He wears many hats, and you'll actually see him later talking about the work he's doing in Kenya. But this morning he's here to talk about his role in several Inter-Country Quality Nodes on math and science education, and on peace education in Kenya. And these bring together interested governments in the Africa region to think about a certain issue, and develop strategies for implementation.

Ramya Vivekanandan, is a program specialist in the section for Inclusive Quality Education at UNESCO Bangkok. And she has been the head of secretariat for several years since about 2012, for the NEQMAP, the Network on Education Quality Monitoring in the Asia-Pacific, which Esther mentioned earlier. So, she's going to tell us -- it's quite an established network regionally, and the focus has been on skilled development, quite a bit.

And finally, we have Mercedes Miguel, secretary of innovation and quality education in the Ministry of Education and Sports in Argentina. Again, someone who wears as many hats and has done quite a bit of work when she was working in the City of Buenos Aires, and now at the national level. But in her spare time has also been convening governments around Latin America to get together and talk about the issues of skills. She was quite active in the Learning Metrics Taskforce that we convened with UNESCO, and has been continuing that work.

So, I first want to just get started by asking, you know: What is the state of affairs? We've heard about what's happening globally with the Sustainable Development Goals, you know, they include a focus on skills among other things. So, what's happening in your regions, in response to this, or it's already been happening?

So, let's start with Darius who just returned from the ADEA Triennale in Dakar, Senegal,

last month. It convened education ministers from all over the African Continent. Were skills on the agenda there? And can you tell us a little bit about what's been happening in Africa?

MR. OGUTU: Thank you. We held our ADEA Triennale in Dakar, Senegal from 14th to 17th March, this year, and we were glad to be hosted by President Macky Sall of Senegal, who happens to be the chair of the 10 Africa champions especially on education, science and technology. And during the ADEA Triennale skills was the focus. Issues about employability and the future of the African youth; and we were focusing on the agenda, Sustainable Development Goals 2030, as well as Agenda 2063.

And trying to address issues around how we can prepare the African youth for the future, and for employable skills. The key issue here was bringing together policymakers in the form of heads of state, ministers in charge of education, science and technology, and senior minister officials. And U.N. agencies, NGOs, civil society, teachers unions and association, all those stakeholders working around education, to share ideas on what has worked elsewhere, best practices, present research evidence, and be able to strategize on the way forward, how best to address the issues of skills gap in the continent.

And there are several initiatives that are already being proposed. One of the initiatives that member countries are working on is the Inter-Country Quality Nodes, and we have several of this. I happen to be the Chair of the Inter-Country Quality Node on Maths and Science, as well as the Inter-Country Quality Node on Peace Education, these are hosted in Kenya; and I'm also part of the Inter-Country Quality Node on Teaching and Learning that is hosted by the Republic of Rwanda.

The whole idea of Inter-Country Quality Nodes is to have member countries lead the discussion on issues of concern around those key areas. And these are government-led, and we able to bring on board other partner states that are interested in that area, to try and share best knowledge that we have, best practices, see what we can duplicate across the Continent, or what we can learn from the others.

If I try out something and I fail, I do not have to watch you try the same and fail, and tell you later that I knew you were going to fail. The idea is for me to tell you that: oh, the road you are taking is bumpy ahead, maybe you could take detour and it would be much more -- smoother.

So, technically, it's sharing what works, and pushing it up all to the highest decision-makers in the Continent under the African Union Commission so that the Heads of State get to hear from

the ministers in charge of education, those in charge of science and technology, and what the technocrats are working on, and what is working. And therefore adopt policies that are aimed to bring about change in the African Continent.

MS. ANDERSON: Thank you. And we look forward to hearing more about, you know, what Kenya has been doing in response, and what you've learned. Mercedes, skills have been on the agenda in the Latin American region for quite some time. Can you give us a little history and an update on where things are now?

MS. MIGUEL: The truth is that Latin America is a very active region, and that virtually speaking there has been many attempts at innovating. And I should say that there are countries like Chile and Mexico and Brazil that have been pushing forward more than others. In Argentina, Buenos Aires City, when we were at the Buenos Aires City, Ministry of Education, we pushed very hard to implement different missions of how to work, and that not only the contents in the curriculum, but how to work at school level.

I think that's a huge challenge that we have in the region, and maybe because of how powerful their teachers, their unions and the students are in terms of having great discussions. When we discuss we discuss altogether and all the voices are raised, so this maybe takes a lot of time in having discussions. I think that a great challenge it has been, and I think that is what Chile and Mexico and Brazil could do very well, is to plan their discussion and to have final regulations, laws and documents that could trace the pathway.

And what we are doing right now in Argentina is to unite all those great things. Peru, it's another country that has done a lot in terms of innovation and changes in curriculum and education system innovation, they have worked a lot with -- I know that they have been working with people from Finland and Singapore, so in Argentina, and when we were in Buenos Aires City we were very eager to learn from others.

And that is something that I want to say how good is for the countries and global cities who are trying to implement, how good it is to have this kind of project.

So, congratulations to Brookings Institution. It's very good for us to learn from others. In the region we are trying to, Buenos Aires City, and now in Argentina, we are always trying to make these

networks and meetings so that we can share what we are doing.

Regarding to skills, there is a lot to do in the region. We are, I think, Argentina and the region, because I am part of UNESCO 2030 Agenda, I represent Latin America in the Steering Committee, and although Brazil and Mexico, they are huge and they really push the region, we are 12 countries, and we have to work together, so we organize a meeting in Buenos Aires last December, and one of the main topics of the agenda was how are we going to implement in our systems, the skills vision; because the first phase is to know about them.

Esther showed us how present they are in the discussions, in the conversations, in the documents, but the truth is: how are we going to get those skills inside every student's daily lessons; and every teacher, daily plans? So, I think that's a huge challenge that we have.

MS. ANDERSON: Okay. Could I ask another question? So, you know, a lot of times we've heard that teachers are very discontent with needing to focus on literacy and numeracy alone, and seeing the need for other skills, but not having the space in the curriculum. Darius, I think that was the story I heard about you, it's why you went into the government to begin with, from being a teacher.

MR. OGUTU: Mm-hmm.

MS. ANDERSON: So now, you know, that the other countries are looking at a broader approach, what challenges are just -- you know, what opinions still remain that would be kind of counter to the skills approach?

MS. MIGUEL: It's a good question. Yesterday we've been working in a room the whole day, a group of very interesting colleagues in countries, and one of the topics was exactly what you saying. The curriculum and the learning space at school, physically it has three, four, five, six hours. It starts and ends today, two, three years, at least.

The whole school learning is going to be an application on the cell phone, so there are not going to be any more frontiers for learning, new learning spaces and time, but today, the curriculum, it has a determinate quantity of -- amount of subjects that you can have, and an amount of teachers that you can get inside the classroom to teach one student.

So, I think that the biggest challenge here is to rethink what we are doing inside the classroom. In Argentina, we are moving out from subjects planning towards skills planning. So, instead

of having one student facing and getting eight teachers, maths, biology, chemistry geography, arts, language, whatever, they come and go, and it's like: no maths, no biology, no chemistry. They are not learning like that anymore.

They go out and they make 400 movies. My 13 years old girl and my 11-year-old -- 9 and 11, I have two girls, they are producing and learning and asking them, each other: what is it about this and that? They are not acquiring information and learning like this. And that is what is going on inside the classroom, so we have to rethink how are we going to introduce skills and subjects and values, it's all together.

So, I cannot think of a teacher for communication skill, a teacher for creative skills, a teacher for how to learn with others. So, the huge challenge is, how are we going to at government level, plan, strategy, to deliver this change. I'm thinking of Michael Baba right now, the (inaudible). This is a huge challenge, huge challenge, because we cannot keep on thinking that in our curriculum we will have chemistry, physics, communication, learning without collaborative work, theory. It's not a subject anymore. It's a learning process.

If students have room to experience the learning, and the teachers to experience the teaching as a whole; what it's worth learning today, and the how, not what, but the how are our students going to acquire that learning, is the huge challenge for me.

MS. ANDERSON: I was actually going to segue to Maysa, who has all the answers. No. But who has done research on the skills gap, and how technology can potentially bridge the skills gap in the Arab world. So, Maysa, you published the report last year, and highlighted various technology initiative, what's happening in the region now, and have you seen any of these recommendations implemented?

MS. JALBOUT: Sure. But before I answer that question I just wanted to step back a little bit and sort of say that the skills movement in Arab world, so across 22 states, has been sort characterized by three different phases. One goes back to the sort of low level of learning outcomes across the region, and this actually was framed very well in a report produced by us here at Brookings, called the Arab Learning Barometer, in which we had found that while we had gained quite a bit of progress in terms of access to education, it was the quality and learning outcomes where there was the

biggest challenge.

So, 50 percent of students were actually in school, were not attaining basic learning outcomes, and that's a huge, you know, anchor to the discussion around skills, because this is where governments are primarily concerned about basic literacy skills, and math skills.

So, much of the concern and discussion in government is around that low level of attainment. And that can be seen in sort of all global measures. For example, in PISA's results in 2015, of the six Arab countries who were participating, only one country, Qatar, I believe, was the one that showed some progress in basic skills.

The second is one that's connecting the learning outcomes to the workplace, and given that there's such a huge youth population, over 100 million young people in the region, there is a massive concern around the impact of that quality of learning, on the connection to the job market and the resulting massive unemployment.

And so the connection to work skills was extremely important, and this is another major concern, and how do you make education relevant to the work environment; and the basic skills that you need, basic working skills? Such as being able to work independently, and working together, thinking critically, all of those are important. And they connect, obviously, to the breadth of skills that we are talking about.

And then I come to the third level of concern which is: How are young people in the region prepared for the changing world that we live in, the interconnected world, the one dominated by technology where jobs are changing so rapidly. And there is a massive concern around the fact that young people, not only lacks some basic skills but are not necessarily prepared for that transition for jobs in the future.

So, now there's quite a bit of work around preparing young people for having the types of skills they need to engage in a more interconnected world. So media literacy, digital literacy, English language learning skills which is, you know, the primary language of working in a global community. So, characterized by these three sort of levels and we are -- I'm encouraged because we are starting to see some work and some progress in using technology, which is coming back to the report that we produced just recently, around using technology to bridge that gap.

So, for example, the foundation that I work at, we are trying to use online learning to provide young people with opportunity to upscale, so those who have actually gone through the education phase but have not necessarily gained some of those skills that would allow them to work, in the jobs that are coming into the job market.

And one other example I would say is related to quantifying and evaluating the type skills young people have, and actually being able to recognize them. So, an example of that would be an initiative by (Inaudible), which is a (Inaudible) initiative that is working with employers and with a job skills website called MAPE.com, that is giving badges to young people that actually go through certain online courses, such as Nukes, in order to give employers a sense of what kinds of skills these young people have. You know, those are just some examples, but signs of some growth in that area.

MS. ANDERSON: Okay. And so I think, you know, what we've heard so far is that in order to for us to get different outcomes in the skills we really need to rethink how we teach the skills. And Ramya, I know you have been doing some work on those topics. Tell us a little bit about the work in the Asia-Pacific region around transversal skills.

MS. VIVEKANANDAN: Thank you, Kate. So, actually I should start by saying that for UNESCO, how we define Asia-Pacific, because actually it's a huge sort of diversity in a number of countries, so including South Asia, East Asia, both Northeast and Southeast, the Pacific as well as Central Asia, so actually 48 different countries, two-thirds of the world's population. And we are sitting in Bangkok as a regional office covering all of these countries.

So, obviously there's a great deal of diversity. But actually for UNESCO as the coordinating agency for the Education 2030 Agenda, and prior to that the EFA Agenda, I think all of the discussions that took place leading up to the adoption of the Education 2030 Agenda and Incheon in 2015, already there is a strong sense across the region regardless of, you know, the level of development of country, that we should be thinking of a much more expanded notion of skills, and moving beyond the cognitive domains.

And I think in August of 2014, we had our last sort of regional high-level meeting, to provide the inputs of the region into the Incheon and the World Education Forum, and there was something called the Bangkok Statement that came out of that meeting. So, there, I think it was sort of

very formally encapsulated, this idea that as a region we conceive of skills as being much more than the traditional, you know, literacy, and numeracy, and talking about exactly the areas that Esther was mentioning in terms of communication, and critical thinking, and creativity, and being able to live and work with others.

So, this was already very much the thinking, I think, of the Asia-Pacific, even prior to Incheon. And then when you look at the level of particular countries, I think almost all of them, when you look at their national vision statements, or mission statements for education, as well as the broad sort of policy statements, you find very much this perspective reflected.

So in countries as diverse as, say, Singapore, where in their -- what they call the Desired Outcomes for Education, they talk very much about these areas, such as moral integrity, such as being able to work with others, such as being able to communicate; a country like Bhutan kind of on the other end of the spectrum. Also when you look at their national education blueprint, it talks very much about the same types of desired outcomes of what learners should have.

So, I think that then, from a regional perspective, for UNESCO, as Esther mentioned, so we've been working -- looking at what we call the transversal competencies, really since 2013, and starting with by leveraging a network that we have called the Education Research Institutes Network, which as Esther told you, a group of universities and research institutions in the region that are working in education. And so they were actually three studies, three phases of work that were done looking at the so-called transversal competencies, which were framed very much along the diagram that Esther showed in her presentation.

So, the first phase was really looking at the policy level, you know, really, what's the overall thinking of countries as far as this whole agenda is concerned. The second phase looked very much at school and teacher practice, and then the third phase, the report of which was just published last year, was looking more at the impact of all of this on teacher development and training.

And so I think that overall, some of the findings to highlight from all of that, would be that many countries are primarily focused on creativity and innovation, and then interpersonal skills, as kind of the two main sort of subsets of these competencies that are deemed to be important. And also a lot of this, I think, in the region is driven by actually kind of the economic discourse and, actually what Maysa

was referring to in terms of being able to connect that to the world of work; and rationalizing transversal competencies in terms of preparing learners for that.

But then I think a lot of this work really showed then the disconnect between kind of these broad vision and policy statements, and then the realities of how teachers who are committed to this in theory, but how they can actually, you know, move towards this everyday practice. And then the assessment of course, was kind of another big missing link.

So then the last piece of work that we did on this, which focused on assessment, leveraged another network that we have called NEQMAP, which as you mentioned is a regional network on assessments that I coordinate from our office in Bangkok. And so this piece of work which was coordinated by Esther, we published it just a few months ago.

And, again, you know, I think the main findings were simply that even though many countries actually have in their national assessment frameworks, or other sort of policy-level documents, commitments to assessing these other areas, there is a big gap in terms of how you actually do that; capacity gap, and then also just not access to tools and instruments, either because they don't exist, or because they are not known, or other challenges.

So, I think that by leveraging these two networks, we've been able to -- you have to really kind of look at this from a systematic point of view across a number of very diverse countries, and so we are looking forward to continuing that work. I did bring a few copies of the report, which I'll leave at the back of the room.

MS. ANDERSON: Thank you. So, as Esther pointed out, we started on investigation of skills policies with a couple hypotheses. One was that a country would first start, maybe by making a political statement identifying the mission and vision and including skills there. Then identifying the specific skills that they want to focus on, including those in the curriculum, whether through a reform, or some sort of other process, and then finally by articulating how those skills are intended to progress.

But we know that the reality is not so straightforward, so I wanted to see, maybe what our panelists think about why this might not be true. So, Maysa, do you have any thoughts on why we don't see that kind of logical progression of the MENA region, Countries like Bahrain, mentioned skills in their mission and vision statements, but not in the curriculum, and the opposite is true in the UAE? Why might

that be the case?

MS. JALBOUT: I think one of the reasons is because there is a disconnect between the vision and implementation, and that's probably -- you know, it goes back to where I was just talking about earlier where the concern on a day-to-day basis in the Ministry is really focused on basic learning outcomes, whereas the country of course aspires, you know, to be globally competitive, and producing young people who are able to not only obtain the jobs in the 21st Century, but to create jobs and to be entrepreneurial.

So, always the aspirations are much higher than implementation. But part of the reason that there's this disconnect is the pressure that is often on the Ministry of Education, which sometimes it manifests itself in continuous change, and the Minister of Education, and the senior level that's there, so you know, a lot of the starts and stops again, which, I imagine is common across all of our regions here.

Also, the other thing is that often, and vision and a mission of the human resource development of a country -- aims for best practice, but there is a huge gap to where the country is, and there are several steps that are missing, in the implementation, in the framework.

And perhaps also a disconnect to where the emphasis is on what the education sector is producing, but some of these responsibilities will fall on other ministries. The Ministry of Labor, or Ministry of Community Development, and the disconnect between the different ministries.

And finally, I would just say that, you know, one of the issues as well as perhaps a lack of a framework for assessing skills, which is why I think that the work that -- around the "breadth of skills" is so important, is how do all of these things connect together so that you are producing a holistic individual that can carry all of those skills? And how do we connect what's happening in school with what's happening outside of school. So, often we look at formal skills development through the educational sector, but much of those skills that we are talking about, are implemented by organizations outside of the Ministry of Education. Especially in the Middle East, I would say, civil society organizations carry a huge load.

MS. ANDERSON: And Mercedes, in Latin America the curriculum is often decentralized down to the school, or even classroom level in some cases. So how does the typical reform roll out in a country where you have, you know, the school heads and teachers making their decisions on curriculum,

not at the national level?

MS. MIGUEL: Well, it depends on the country, and Latin America has many different kind of systems. Some countries are very centralized and they define the curriculum at a national level at least, other countries like in Chile or Peru, they have given more autonomy to the schools, and they can recruit their teachers, and they can have each school its own curriculum.

Argentina, we have the three levels. There is a national definition curriculum level, then you have each province, we have 24 provinces, it's a federal system. Then each province writes its own curriculum, and then the schools apply what the province has set. It depends on the countries, and this is what makes it more difficult when we get together the whole region to discuss implementation. Each country has to plan different kind of strategies. But I think that those who were absolutely decentralized, are trying to get back to some kind of national framework, regarding to the student that they want to have -- that they graduate, outcome of the students.

What student do they want when their school is finished? So, this is the question that we are trying to work, each of our countries, and when we sit together to think as a region, about curriculum or learning or skills reforms, there is a -- I see that there is a big lack of strategy in planning reforms.

As we were saying, the skills are around the world being -- we are talking about skills, we are writing about skills, we are investigating about skills, but there is not a strategy on how are we going to track and assess those skills; and it's exactly as you were saying, there is a huge lack of frameworks for assessing. So, when a country, or a global city, or a school, once we start this kind of reform, there is a huge lack, at least in Argentina, and in the region, it was very difficult for us too.

The universities are not ready to train the teachers on a skills-based qualification. And there aren't national or international frameworks for assessing skills. Some huge assessing teams are starting, besides it has a Future Skills Developing Team working on the new skills that they are going to start assessing. But we find Colombia did an amazing work, and they started assessing some kind of wellbeing skills at the student level.

But we saw tiny things that are appearing. I think that teacher training, assessing and planning implementation as very important. And although we are working in Argentina to give schools more autonomy, because if not you are just telling them what to do, and you are not giving the

professional support on how to do it.

So, back again, I insist on planning, planning the strategy of implementation, now this, then this, then this, and here I'm going to assess you. And during the process giving support, because if not, the schools and the teachers are not ready to work on a skills concept (inaudible), I think.

MS. ANDERSON: And that brings us to another hypothesis that we had, that when a country is undergoing a reform that the issues of curriculum assessment and pedagogy would be tackled at the same time, altogether, and that's not always the case. So, maybe we could go to Ramya. And you know, is this the case, the countries that you work with in the Asia-Pacific region, is there one area that countries tend to tackle first? Or are some doing kind of all three at the same time, and what does that look like?

MS. VIVEKANANDAN: I think it really varies from country-to-country, but generally we feel that it's been fairly disjointed. I think curriculum probably more than the other areas has had more attention with, you know, countries following different approaches, whether that's actually setting aside standalone subjects for some of these areas, or integrating within existing subjects, or looking at extracurricular ways of integrating these skills.

But there are, I think now, in a number of countries efforts being made to actually integrate Breadth of Skills within the curriculum. But I think when you look at teaching and teacher training in particular it's still not sort of on the same pace I think for various reasons. To the extent that teacher training does address, you know, preparing teachers to think about how to teach these new skills, I think it's more an in-service, and it's more project-driving and more ad hoc.

I think most countries in our region haven't really reformed their fundamental systems of teacher education, particularly pre-service, to really address this area. And that when you look at assessment, I think we are even further behind, in the sense that there is just really that much that's happened. Even though with our research that we did with Esther, we did see that in some countries, you know, there are some efforts being made.

But I think fundamentally, there is a big disconnect really between how, now having a much more holistic vision of what types of skills our learners need to have and what education is all about. But then, as other panelists have also mentioned, really, this assessment piece, where we are still

very much kind of very traditional in terms of how we conceive of measurements and evaluation.

And that's certainly the case when you look at public examinations in most countries, but even a non-high-stakes types of assessments, national assessments, or regional, or international. There are of course some attempts with what PISA has been doing recently with the collaborative problem-solving, and soon on global competence, for example. But I think most of these tend to not really be connected very much with what's happening in countries, and really in the classroom. So, I think this is really kind of the piece that we have to focus much more on in the next phase.

MS. ANDERSON: And Darius, we heard last time that we were in Kenya, the prior curriculum reforms, it seems like were never fully implemented, and with the new reforms coming in, is that something that happens, where maybe a curriculum reform starts, and then, you know, it never gets to the point of full implementation before another one comes in. Tell us a little bit about, kind of, some the issues with that?

MR. OGUTU: Well, the typical situation in a Kenyan school, or Kenyan classroom, is that a teacher has a textbook that is a syllabus, and you have 30 minutes, or 40 minutes within which to do something with the children, and within a given time, or a year, you are supposed to have completed the syllabus, and covered what is in the textbook.

So, typically it's a race to complete -- to cover the syllabus, or to go through the textbook, so we do not look into what skills are the children -- have acquired by the end of it, or are we expected to acquire. So, in most situation, as a teacher, and I'm a trained teacher, I will make an effort to use my 40 minutes or 30 minutes in the class to enable me to cover the syllabus, because at the end of the year, I'll be assessed based on syllabus coverage, and not much on whether the children have gained any skills.

And so we set out to change in the reform process; and so that we can open up instruction in the classroom to be more skill-based than just an issue of how much content we've covered; and the interesting thing is that the discussion has been upped in terms of: Are we going to reduce the subjects? Are we going to increase the subjects? Are we going to bring on board new aspects?

And so the debate ranges round subjects, but we want it to range around skills. What skills do we want the children to acquire? And how do we determine whether these skills have been acquired? If I'm in a classroom, and I teach, by the end of the lesson, how do I ascertain that what I

intended has been achieved? And so it becomes critical, because even as you propose reforms that you try to bring on board new ways of doing things, then you have to realize that pedagogy has a stake at this.

And the pedagogical approaches in most cases, if it's yes, textbook-based, syllabus-based, then you've got to change the mindset of teachers. The interesting thing is, there is a whole cohort of already-practicing teachers, whom you've got to train to bring on board to the new thinking. And that in most cases is where we fail. We come up with new reforms, we think it's going to be new because we have a document that details that to be new, but my teaching approach is how I do it in class, is the same old way I was taught to do it.

So, we fail again. Not because the reforms are not good, but we do not prepare the teachers well. We do not support them. We do not create an environment where that -- a reform can be implemented. And the interesting thing is that in Kenya, for example, and as in most African countries, we determine success or failure based on the score you get in a national examination.

So, based on that score, then I'm placed in the next level of education, and then I got to university, or proceed to secondary, and then I am deemed to have passed, or to have excelled in a certain level. But the situation here is: how do teachers assess that learning has taken place; that skills have been acquired?

And so, under the Learning Metrics Taskforce, that's as part of the African Learning Champions, we set out to see what it is that can encompass this breadth of skills. Now we expect a holistic kind of approach to look like. And we brought together teachers, civil society, ministry officials and quality assurance and standards officers. And I must mention here the quality assurance and standard officers are the ones who go to school to see whether learning is taking place.

But when they get to school, they check your skills over, your lesson plan, your record of work to see whether you've completed the syllabus, or you are on track. They have no way of determining whether the children actually learned, or acquired any skills.

So, we got together with a number of countries and realize we are facing the same kind of challenges. And under the Network for Assessment of Learning in Africa, NALA, we are trying to look at a common set of tools, of determining whether learning has taken place, at the various levels. And to

enable us compare, even at institutional level, you are able to look at your school and your classroom and tell whether the children are acquiring certain salient skills.

And you have a way in which to compare, maybe with others, and be able to provide some remedy, or some kind of support to those children who are not able to achieve this. Part of the reforms we are proposing, for example, is on value-based education, now we have to inculcate values in the system.

But then how do you teach values? How do you assess values? How does a teacher tell that a child has acquired certain values over a period of time? And these are key questions that we are looking at, and hoping that through NALA, through bringing together a regional member states, we can share ideas, we can share findings and maybe tools that enable us to compare and look across the breadth of skills that you are supposed to have acquired.

So that I don't wait for the end of the summative examination to tell me that this number of children have failed, but in the course of the teaching, I'm able to tell that my children are weak on this area, I need support in this area, and I'm flexible enough to seek help. The other disease we suffer from is that, it is my class, and I'm competing against Kate, I'm competing against Mercedes.

So, I have to, it's like I'm in my own lane. It's a race against Mercedes, against Kate, and everybody is aiming to cross the finishing line. But we are realizing that is not the idea, the idea is to be able to look across and say, ah, Kate is struggling, can I be able to give her a hand. And Mercedes has a better idea. How can I use her idea in enhancing my teaching in this class?

So the reform process right now, we are embarking on coming up with a new curriculum, and we are facing this huge task of changing the teacher's mindset in terms of collaborative learning and teaching, peer teaching, so that they can get support from within the institution. And by the time the national government comes in, or the county government comes in, and they have a support system, it's already an ecosystem that is open and friendly to suggestions, and friendly to change so that I do not have to say: this is how I was taught, this is how I do it, and this is how I'm going to continue doing it.

If it's not working, then I might as well try something else new. So, currently we are projecting that it's going to be successful, because we are making a provision for making sure that all the teachers, at least we get to reach all the teachers in terms of preparing them for change, and in most

cases we have resistance to change, because we think that change will not favor us, or will be much more -- add more workload on to our already stretched workload.

But we want to motivate the players in the system, and give them this kind of -- hoping for something higher than just getting a score on a score sheet for my children, but then I'm preparing for the future generation.

MS. ANDERSON: Now, listening to you talk, and all of you talking about the challenges, and thinking about the top skills that we found are priorities for children to be learning. The communication, collaboration, problem-solving, creativity, it seems like those working on the reforms had maybe more of some of those skills, we could get there a lot quicker. Great!

So, I think at this point we'll open up to the audience for questions, and we have some microphones back there, if anyone has questions for the panelists. I see Shamus up here, and Josh.

SPEAKER: Thank you. Are there examples of countries where transversal skills have been incorporated into high-stakes assessments? And if not, does it matter?

MS. ANDERSON: Okay. Let's take a round of questions, maybe four, and then -- So, I think we have Josh over there, and Marguerite, and Martin. We'll do those four.

MR. MUSKIN: Joshua Muskin from Geneva Global. Thank you, all, very much. I have a feeling that we are looking at this from 10,000 feet, or 10,000 meters, and my fear is that systems solutions which we all are sort of obligated to work with, risk undermining classroom solutions. And Darius, you stated getting at this at the end of your last intervention talking about getting teachers, not just with the proper mindset, but giving them the proper tools to be able to do this.

And just as an illustration of a systems solution. I was involved in one country where a major international donor helped the country come up with a relevance curriculum for the whole country, one curriculum that's supposed to be relevant in the desert, on the coast, with the (inaudible) people, in the cities, in the rural areas, and the like.

So, we talk about the assessment, we talk about curriculum, and what I'm hearing you talk around, Darius, is how do we, not just give a curriculum that teachers can use with a new mindset, but how do we give a curriculum that teachers can use creatively, can manipulate, can discard some of, add to? And also with assessment, if we are assessing creativity at a system level, we are really

handicapped in being able to assess across creativity, because we can't distinguish between the student who is creative in mathematics, who is creative in arts, who is creative in literature, and the rest.

And just very quickly, at Geneva Global we are playing with a -- we are not playing with -- we are working with an accelerated education model, condensing three years, the first three years of primary into one year, to equip the kids to go straight into fourth grade, with great results. We are doing this because the teachers are -- being able to bring their own solutions to assessing, feedback and remediation.

Being able to select creatively from -- or judiciously from the curriculum, and the planning people at the ministries and at the regional areas love it, the curriculum people are very suspicious because it's telling them that what you have as a curriculum really is not as critical as you think it is. So I'd love some illustrations of how to bring what you are talking about from 10,000 feet or meters down to the classroom. Thank you.

MS. ANDERSON: To the classroom. Thanks. Okay, go ahead. I think we have --

SPEAKER: I'm Merva Chi, from India. And thank you for the panel, it was very interesting. My question is that I agree with the gentleman who went behind -- before me, but we've been talking a lot about how teachers are resistant and they are very tied into the curriculum, and to the syllabus and so there's no space in the classroom or in their minds on how to do this. My question is are we (inaudible) -- and that teacher training is not yet up to it. But also the kind of pedagogy that is used in teacher training, does that help to create the same breath of skills in the teachers, is it geared towards that? And I think that's where it's lacking.

And secondly, I didn't hear enough about higher education and what it's expecting from the -- what does it respect? What kind of certification? What kind of -- if it's still expecting a certification that says that they know their math, and it's the very subject oriented? Then there is a contradiction between the teacher -- and schools don't know what to do because they are short-changing your children if you are not preparing them for higher education.

And on the other hand, you are supposed to do these breadth of skills which they agree with but don't know what to do when it comes to their children getting into colleges and universities after that.

MS. ANDERSON: Let's do Martin, and Marguerite, and then we'll go back-to-back the panelists.

MR. HENRY: Martin Henry, Education International. I do think that teachers are the biggest way that you might change, and create the biggest difference. So, I'd just like to look at the assessment issue for a minute, because a number of the conversations we've been having have been around assessment as a summative and hard end, sort of a glass panel empiricism type tool, and I'd like us to think about shifting gear for a minute, around the sort of formative assessment that might happen around competencies.

Or if you go back to the DeSeCo work, it was always discussed around students' self-assessment, and student peer-assessment, and that is an area where I think you can get into competencies in a way which gives students more agency, more control, and more relation to their teacher in the discussion they are having about the way they are developing those skills.

So, I think if we look at the sort of skills we are talking about, and I'm talking particularly around the social and emotional area, and around the key competencies area; isn't it a more sensible thing for us to think about how teachers can help facilitate the students' ability, to look at themselves in terms of those competencies, and how they might move along those competencies, through the years and over time, in a way that has a framework that gives them a way of thinking about where they stand? Thanks.

MS. ANDERSON: And directly back here, the second to last row.

MS. CLARK: Hi. My name is Marguerite Clark. I'm with The World Bank. And first, thank you to the panel for a very interesting, useful discussion. My question is about the role of evidence in implementing a lot of the ideas that you've been talking about. I think it goes partly to the comments that Mercedes was making about implementation. I think these are all great ideas, but there's risk involved. And if I'm a parent, I would worry if my child was exposed to a curriculum that maybe is wonderful at developing skills and competencies, but is not going to prepare them to get into university, or succeed in the certification and traditional systems that still exist.

So, in terms of trying to engage society, not just educators, around these ideas, to what extent have any of the panelists worked with maybe doing small-scale impact evaluations, bringing to

bear research and evidence to the agenda on the discussion to convince people that, yes, this works, it has value and it will make the future better for your children, and for all of us? Thank you.

MS. ANDERSON: So, we have a few questions here. I'll just repeat them, and then whoever wants to go. Examples of countries where transversal skills have been included in high stakes assessment? How we cope when systems solutions aren't working and how to bring it down to the classroom level? How to make sure that the kinds of pedagogy and the teachers themselves have the breadth of skills needed to teach these skills? And several comments on, you know, the higher education, or even secondary education in some countries where there's those high-stakes exams, and that measure more traditional skills, how do you juxtapose those? And then if any of you have any research on having any evidence on some of these approaches, and again, formative assessment as well. I'll start with Mercedes, and then Maysa?

MS. MIGUEL: I would like to say, before we keep on talking, like in theory, everything that we are doing and discussing, and planning, regards to human beings, very tiny, little children. They are getting inside the system when they are 3, 4, 5, and going out when they are 18.

They are thinking about 2030, and those kids are sitting today in kindergarten in year four. But this is not futurology, we have to plan in strategy based on evidence what is the best for them, for them. As a mother, as professionals, as scientists, as researchers, we are talking about kids who are going to be the future leaders of our nations.

The biggest evidence that we have, and I am going to talk regarding to Argentina, it's global and local, the global evidence is that the economies and societies, and the way that we are living, humans are being tracked by technologies, artificial intelligence, robots, they are already among us. The jobs have changed and will keep on changing. So, you are worried about universities, universities are in huge crisis, altogether with school systems, because the way that we are delivering content and information must change towards a work-life way of learning. People are learning all the time.

So what we are trying to do here, as Darius was giving us a perfect picture of what is going on in any classroom, it's not only Kenya. What he described, it's any classroom in any part of the world, and changing that, of course, has to do with how are we going to train teachers. Teachers teach in the way they have learned, so if we keep on having teachers sitting on a bench attending to a lecture,

they will do exactly the same thing for the rest of their lives.

So, we have like a two double entrance to really impact on the way that we need to impact to make this reform. This is grass roots transformation. Those who already are teaching, they stay, the government invest tens of millions of dollars in training teachers every day. We have 1 million teachers teaching daily in Argentina. But we also have to pay attention to those who are starting to become a teacher.

Are we going to let them keep on starting this, they are starting so that then when they go back in the system, they will have a crisis with the 21st Century skills that are not being taught. And then I would like to say that it's not subjects versus skills. We are not -- I mean, I think we shouldn't have this kind of discussions. We should really add skills competencies and subjects all together.

The students are human beings, but they already have values, emotions. The thing is that we are trying to see: how are we going to plan that inside the classroom? And how are we going to assess that? But the kids already have emotional skills. The kids know how to work together. You give a group of kids a ball, and they start playing football, and they know and they understand what it's like learning with others, and peer learning, they do it more naturally.

There is a generation right now of teachers, that we have to train, but the coming teachers must have this new ambition of what we are doing. And just to finish, regarding to assessment, I think there are two big kinds of dimensions of assessing.

There is the huge national, international, big, very expensive assessment for educational systems, and then the one that we really need, is a summative, daily, simple way of tracking learning outcomes. Assessment is to see if our students are learning, and to see if our teachers are doing well.

So, I would like to keep these two dimensions very -- not separately, but because they are not -- because any kind of future assessment that we do, we do it in our classroom with our students. But, I would like to say that it's a huge challenge, and how are we going to teach our teachers to track the learning outcomes every day.

MS. ANDERSON: And if we have time a little later, I might come back and ask you about some of the things you've been doing with teachers in the City of Buenos Aires, and some of the examples of how you've kind of flipped that model. But I want to go to Maysa next to follow up.

MS. JALBOUT: Well, I'm not sure how much I'm going to address some of the questions that were raised. I think some of them are ones that we are all grappling with. But I wanted to mention two initiatives that, perhaps, give a clear indication of how -- sort of the movement and skills is -- many times, skills development is, many times, reflective of the times that we are living in, and what we are trying to make education sort of develop in young people.

So, I think, two things. Two initiatives that come to mind, that exemplify that. One is a new initiative that was just launched by The World Bank; it's called Education for Competitiveness, in which they are going to work across the many regions to help prepare young people in high school in college readiness. An initiative that my Foundation is also working with, and that's really speaking to the skills gap, and connecting young people to experience, and to the marketplace, and putting in place measures to evaluate again job readiness, and the kinds of skills that you need to work in the marketplace. And what's different about that initiative is using technology to bring that information directly to the student and using, you know, teachers and the curriculum to reinforce some of those skills.

The other is one that speaks to sort of the concerns that countries in the Middle East have around preparing young people to live in a global community. And sort of the crisis around making sure that young people understand sort of shared values, global values, and I think, you know, we call them global citizenship. In the UAE they just launched an initiative that's called moral education curriculum.

And actually I was just at a conference where they were talking to principals about what that means, and it's really very interesting and I encourage you to look at it, and it's really bringing together some of those global competencies that look at, you know, the characteristics of an individual and how they fit in their community, and the responsibilities towards their countries, and also: how do they represent their heritage and their values to the global community?

I think it's going to be very challenging to be able to integrate that in the classroom, for it not to be seen as yet another added burden on the teacher, but I think what's interesting about what they are doing is they are trying to connect the schools to communities, and enabling the teacher to see that the role of civil society, and the role of things like volunteering has an impact on what you are trying to reinforce in terms of values in the classroom.

MS. ANDERSON: Ramya, and then Darius.

MS. VIVEKANANDAN: So, maybe just to address a few of the questions. I think there were a couple about assessment, in general: and this question about looking at high-stake exams, and the extent to which you can assess some of these areas. So, I mean, absolutely, it's sort of depends, I suppose, on how such exams are constructed, but I think when we think about skills, like, whether or not, say, in an assessment of reading, whether a student can read a passage and responds critically, showing evidence of critical thinking, or whether they can synthesize the information.

I think, absolutely, there are some countries that have sort of worked in those types of questions, you know, moving away from just a standard multiple choice kind of format. For example, in order to address, you know, some of the additional areas, I think also we've seen in our region that in social studies exams, in particular, there's are some interesting space available for exploring some of these other skills and areas.

So, in Korea, for example, and I believe in the Philippines as well; so, I think there's definitely scope for that. I think also some countries in terms of how they define their high-stakes exams, are now moving gradually to include a school-based assessment portion as a part of that, that would count towards the overall exam score, or sort of a portfolio that the student has.

So that's the case in Hong Kong, in Malaysia as well, where actually they've eliminated exam I believe at lower secondary level, in favor of school-based assessment. But yet this is carrying a stake in terms of progressing and streaming to additional levels of education. So, I think that's also kind of an interesting thing.

Also I think that now, with all of the conversations going on about, even in some of these international and regional assessment programs, including additional areas such as the global competence in PISA 2018. Or actually in Southeast Asia there is a Primary Learning Metric that will be -- that will start in 2018 for grade 5, including reading, writing, math, but also global citizenship, quite interestingly.

So, I think the fact that even -- as Mercedes was saying even though these were kind of the larger international regional programs, it's sort of creating this interest, that's also I think compounded by the fact that, we didn't talk much about SDGs, but we have the target 4.7, that focuses on Global

Citizenship, and ESD and all these areas. So the fact that countries are now actually going to have to be reporting on this, I think is also kind of spurring new interest. And also like the colleague from, I think Educational International said, looking at more formative ways of assessing some of these areas, whether performance assessments, or portfolio assessments or other things.

Also those are comments that I totally agree from the colleague from India about the disconnect, I suppose between teacher training, and then how teachers can actually teach these skills. Because, indeed, I think in most teacher training institutions there is very much still a focus on a kind of lecture-based way of learning, but if you are trying to teach students to be creative and innovative, obviously that's not probably the best way to go about that. So that's something that we have to address, I think, further.

And then lastly, theirs is an interesting comment about higher education, and how, for example, university entrants, you know, still prioritize this very much, you know, exam scores and things like that. And I think that's absolutely true. And it's kind of funny, because on the one hand, universities and employers are telling us that they want, you know, students that are holistic and they can do a broad range of things, but then admission requirements are maybe still quite traditional.

But interestingly, in our region, I think we have seen in the cases of a few countries, attempts to kind of look at that in a different way, and sort of reduce the weight of entrance exams, to look more at other areas such as, you know, extracurricular, participation in community service, and other things.

In Korea, for example, actually there is a new reform at the lower secondary level actually they have an exam-free semester; kind of responding to criticisms about all the stress the students face, so the space is now given more towards focusing on extracurricular, and other types of hands-on sort of experiential learning activities.

So, we are also working on this by a new project that we have focusing on actually, happiness and wellbeing in education, very much driven kind of by the Positive Psychology Movement. So this is something that's sort of gradually picking up traction in our region, and so maybe that would address, to some extent, this disconnect with the university and higher education.

MR. OGUTU: I think the question by Josh is interesting. Let's see whether we can make

a landing from 10,000 meters. And it's always a discussion of the system versus the classroom. But my thinking is that classroom solutions are part of the system solutions.

And just giving an example of soccer, a decade ago the Arsenal Football Club had the tag, the untouchables, the invincibles. They went through the Premier League season without any defeat. They won the Premier League. The same coach who was coaching them back then, is the same coach today, and the fans are saying he must go, his (inaudible).

What happened is, he's been using the same system, the same style, maybe it's the players who've changed, but it's the same system that he used a decade ago and won the championship without losing game.

How did it all go wrong? What happened? And it's this issue of value chain. A simple thing; Leicester won the Premier League last year, this year they are struggling to keep up with the pace. They were the champions last year. What happened last year? Was it by luck? Then the same issue that comes in, governments are always scared about giving you freedom to do what you want, because they want to know what you are doing in that classroom.

Guess what? In our reform process we have made a provision for 10 percent county-specific curriculum content. We are allowing for counties and schools to have whatever they want in the curriculum. But even that 10 percent we are worried on: what are they going to do with the 10 percent? How are they going to do that? And I got into problem for teaching what was not in the curriculum, and in some countries you can be arrested for teaching outside the curriculum.

And I thought if I changed the curriculum then it would be flexible, and open enough for teachers to experiment. It's still a challenge, because the policymaker has to make that decision.

Guess what? Now I'm the policymaker, and I'm wondering (laughter) -- I'm wondering whether I should make that decision, or should advise that we should take this decision and allow the teacher to decide. Because if you are going to teach nationalism, what kind of nationalism is Josh going to teach. It might be firebrand nationalism, and is it going to build the country?

So, it's a tricky situation, but we are cognizant of the fact that there's a system in classroom solution, but our approach is that the classroom solutions are a part of the system solution. The little bits and pieces that make up the system solution and we are hoping it can contribute towards

that.

When we discuss about the case of teachers, interestingly the key question is: Who trains teachers, and what kind of training do they have? The teacher trainers, so that if you expect the training to be different then that person who is training the teachers, has to understand that we've changed. But do you realize that in the university, in our case the universities are autonomous, so they will tell you it's the Senate to decide, the University Council will decide on what is going to be offered in the university.

So, some universities it's knowledge for knowledge sake, and we have no problem with that. But what is the reality? In most African countries getting 12 years of continuous basic education is a challenge. So, forget about university for the time being, the 12 years of continuous basic education, what does the child acquire from that? How do they fit in the society?

Because in a situation where a university produces one engineer, how many technicians does this engineer require. How many artisans, or how many craftsmen does this engineer require? So we are focusing on secondary and TVET, so that there will be enough technicians, and enough artisans and craftsmen to work with this one engineer that is produced by the university.

In any case university education in most of our cases, it's elite, it's for the elite; the top cream who make it through the cut-throat competition that is national examinations. The bulk go into tertiary level, they other bulk do not even go to post-secondary training, so we are now revitalizing TVET as a solution to the industrial issues we are thinking.

When we think about employer -- skills that are employable, then we have got to promote TVET as an option. We are not disregarding university, but we are hoping university will come around to the thinking that as much as they are autonomous, they have to look at the situation in the given country.

And yes, Henry, social and emotional area: in Kenya we have an example of a program we are calling Learning to Live Together, where it's student self-assessment, it's peer assessment, where it is the students who are able to tell how it is that they can live together harmoniously. But you've got to give them a framework, you've got to give them tools, support the teacher to create an environment for children to do that.

And lastly, Marguerite, you talk about evidence in implementing reforms. We suffer from

too much evidence, too much evidence. Everyone has done research, everyone has got this evidence, and it's piled up on our shelves. The question is, how do we translate this evidence into practical strategies that make differences? And I agree they have impact in our countries. The evidence is huge.

Kenya has got so many pilots, so many pilots that are going on, on this skill, or that skill and the other, and the evidence is huge. But the question is: what happens after you get the evidence? What do you use the evidence for? And as I said, we are looking at the 12 years that this child is in education. Within those 12 years, and there's a lot of research evidence to demonstrate that if within those 12 years this child acquires the basic skills, at least they will be a productive member of the society.

If I give an example of a female, or a girl who at least acquires secondary school education, they are better informed in terms family planning. They are better informed in terms of nutrition. They are better informed in terms of immunization for their child, better informed in how they -- at least enable their children to access education. For us, that is key, because that is the huge cohort of learners we are looking at.

The universities are doing so well, we are producing excellent people from the universities, but we are working with the universities to change their training, so that the competencies that graduates come out with -- Interestingly, a graduate from university and a graduate from a TVET institution, some employers would prefer the one from a TVET institution.

Why? The one university is more theoretical, the one from a TVET institution is more practical and hands-on. So that's the kind of balance we are looking at and hopefully, it's going to work somehow.

MS. ANDERSON: So, we are just out of time. Can I just have all the panelists say one kind of final sentence on what you want to see in the future in regard to skills for the children in your region? We will start with Mercedes; one sentence. (Laughter)

MS. MIGUEL: Just, we have a long way to go, and we are in government right now, and we have to be very careful of providing the right to high quality education in every single public school in Argentina. We are not doing well in maths and literacy. So, although we are thinking about skills, that is why I'm saying it's not subject or skills, it's all together. And we are working very hard to improve the quality and the learning outcomes; but having a look at what is coming for the future, we also must be

responsible for training our students to face the future that is waiting for them, which, we don't know how it's going to look like in 2030.

MS. ANDERSON: Ramya?

MS. VIVEKANANDAN: No. I think it's really this point about translating. It's great now that we are having these conversations, but translating all of that into the reality of classrooms, and particularly teaching and assessment. I do think we have a couple of opportunities though in front of us now, particularly around the target 4.7, like I said, and the fact that now all countries are going to have to be thinking about, you know, how they are actually, you know, operationalizing this target in particular, and reporting on that.

So, building off of that momentum for the next -- now what -- 13 years. And also the point is perhaps just in terms of regional networks, because certainly in our experience having these two platforms with the ERI-Net and the NEQMAP, has been really key in terms of being to bring countries together, and doing research. You know, developing common frameworks and tools. And so I think this is a really valuable sort of way of working, and I don't know if that's the case in other regions, but we definitely plan to continue to leverage these regional networks, in terms of going forward and looking at more of the questions of the how, and what happens concretely.

MS. ANDERSON: Final thoughts, Darius?

MR. OGUTU: Maybe picking up from where she's left. We know so much about the what, and we are grappling with the how. And for me it's that most African countries are open to taking the risk and working with the how. The key issue here is whether we can get it implemented. So much expertise exists, so much evidence exists, how does this translate to what happens in our classrooms? Whether it's in Kenya, in Zambia, in South Africa, in Namibia, across the Continent, how does this translate into classroom practice? And how does it produce the 21st Century citizen of the world?

MS. JALBOUT: I will just say two quick things. One is I would love to see more persistence in implementation. Most of the countries in the MENA region, know what they need to be working on, and have the frameworks, but they need to be more persistent in following through in implementation. And the second is, and which we didn't talk about a lot today, is that, you know, we are all working towards the skills that young people need to have in order to face the sort of uncertainty that

they will be facing in 2030, but I think that we need to be preparing them uncertainty today.

And then the MENA region where so many of the young people are refugees or displaced, or living in conflict, they need to be able to have the skills today, to survive in a very uncertain world.

MS. ANDERSON: Thank you. Let's give a round of applause for our panelists.

(Applause)

Now we are going to go to a break. One thing, make sure that you have as Wi-Fi connection because we are going to do a live audience poll after the break. So, if you need help, we have our comms team outside that can help you connect.

(Recess)

MS. CARE: Thank you everybody. So in this session we want to explore the general domain of skills. We throw the term around a great deal. And given that the concepts that the term reflects are absolutely central to this education shift I think it behooves us to think fairly deeply about what we actually mean and not only about what we mean when we talk about skills but what those meanings imply. And going along with the theme that I introduced in the first session, you know, what do the skills imply in terms of curriculum, in terms of teaching and in terms of assessment. And so accordingly I'm very pleased to host this panel where I will introduce them properly in a moment but where Sten Ludvigsen will be focusing more on the curricular perspective. Susan Douglas will be focusing more on the teaching and the pedagogical side and Alina von Davier will be talking more about the assessment side.

So what we need to be thinking about is how we deal with the challenges across those three different parts of the education system. So first right to my left here I have Sten Ludvigsen and he is a professor in the Faculty of Education in the University of Oslo. And his research, I am sure he has done a great many different sorts of research in his life because he is about the same age as I am and I know I have done lots of different things so notwithstanding, there are some particular parts of his research that are most relevant for us today. He has been looking at the fostering of cognitive and social skills in the use of digital learning technologies for example both in the education sector and in the work place setting. Of particular interest to us today is his leadership over the last couple of years of a public

committee that has been appointed by the Norwegian parliament to report on the future of the Norwegian school system so absolutely spot on with sorts of things that we are wanting to talk about today.

Next to Sten is Susan Douglas and Susan Douglas has two parts to what is of interest to us today. She is a senior adviser with the British counsel and in that role she provides sector advice to ministries of education, teacher educators and so on and she brings to that role her knowledge and her experience as a practitioner in coordinating a cluster of schools in, I think it is in London.

MS. DOUGLAS: Yes, in west London.

MS. CARE: In west London. And I hadn't really known about this particular approach to education in Britain but apparently there are clusters of schools that are organized and focused more as a group, act more as a group.

And the next to Susan we have Alina von Davier and she is the vice president of ACTNext and this is a relatively recent initiative of ACT. Alina is leading a team of experts that are responsible for developing a research agenda to support the next generation of learning and assessment systems. One of the really big challenges as we heard last session was around how do we go about the assessment here. And there has been a great deal of work at fairly sophisticated technical measurement levels as well as technological levels in assessment and Alina's group is going to be bringing these areas together so that we can look at different ways of supporting both virtual and collaborative learning systems and assessment systems.

So I then we have got a really nice set here of looking at the different aspects that we want to. Before we do that, I want to do a quick what should I call it, an activity to see what you think are the most, the four most important skills and this should raise some questions and some issues for us. So you can see on the screen at the moment, I don't know if you can see because Sten and Susan have got like heads but if you can see through their heads, if you could go online and enter that URL, www.menti.com, you will see the questions which is around what are the four most important skills that students need for the 21st century. And you will find there are four different little spaces there where you can enter your answer. You need to enter that code, 54317 and then you should be able to enter some answers.

And what we will do then is have a little bit of a look at what some of the common

perceptions here are about what are the skills that our students and that our children need for the future. So we can see it's some starting to populate already. And it's one of the things about this is its fascinating, you know, what are skills, what are values? What are human characteristics? What are needs, what are attitudes? What are competencies? And you can see this last array of I guess you would call them human characteristics for now, how we all think that very different things are important. We will find that there is a great deal of commonality and we can already see here that problem solving at the moment is in the lead. Don't, it's not like a horse race. You shouldn't actually go enough or, you know, for a different one just to even it up.

Maybe we should stop at that point because otherwise it's going to overwhelm me. Oh, it went away. Hopefully we can get it back. But if you from the very brief glimpse, all right, from the glimpse that we all have of it right now problem solving, critical thinking, empathy, creativity, collaboration, how do we possibly make sense of this multiplicity of human characteristics? And importantly, how do we think that an education system can possibly comprehend all of these skills in a way that makes it possible for our education systems to deliver them. We might have to leave it open if it's causing a problem, yes.

Notwithstanding, the first thing that I think about when I see things like this is well, how -- are there ways of categorizing these? Do we put some of them into sort of cognitive skills? Are there some of these things that can be taught? Are there some that can be learned or not? If we think about something like self-regulation, which is not a really big item there but its sitting there and think about the preparedness of teachers in a classroom, does a teacher know how to go about teaching self-regulation to a child of five? What about when that child is eight? What about when that child is an adolescent and moving into 14? Does the teacher understand how self-regulation itself develops and matures over the age span? Does the teacher understand about human development, about how we acquire both cognitive and social skills? How we go through different labels of understanding and maturation. All of these questions are absolutely central to if we are going to make this shift to skills.

So we need to be thinking very carefully about what are the skills that are practically possible for a formal education system to help students with and I think Darius in the last session talked about values, where we have particular values. Can those values to taught? Are they learned? So there's a lot of questions here. We can talk about something like problem solving and we know that from

the vast research on problem solving that we can identify sets of processes that we can go through and that we can identify. If we have a problem space we can identify what the artifacts or the modules are in that space. We can identify what the goal is and then we can work out how do we navigate through that problem space? But if we talk about some of these other areas, the values, self-regulation, collaboration, are we actually in that same space? So there are lots of questions here that are raised by our different understandings of what 21st century skills or generic skills or transversal competencies are and how they translate into the realities of an education system. So they are the sorts of issues that I would like us to get into during this session. And I'm first going to throw it over to Sten. Sten, so you have been working on the curriculum reform agenda for Norway for the last few years and I would like you to reflect on this issue of the choice of skills. How can you ensure that the skills that you select within Norway are ones that are going to be teachable?

MR. LUDVIGSEN: Okay. The, I think the first premises for me is that schools have really two different mandates. One is to educate citizens for mastering their life and the other one is getting ready for the kind of workforce and they are equally important. And there's a tendency in the kind of skills framework and the research that is underpinning this skill framework to really emphasize I would say the work force argument to say that some of this skill set that we call the soft skills like communication, collaboration, so on, they come out over a number of surveys where you also get business leaders, leaders in the private, both the private and the public sector. And it is interesting because the question there that is used to address some of these skills don't ask about their subjects in schools so there is some bias in the research instrument themselves which I think is quite problematic. And that was our first experience looking into the kind of the skills, the common skills and the frameworks and so on that was out there and has been out there for the last 10, 15 years. So I think there is a problematic issue here is that the sum of this research really under communicate the need of the specific domains subjects in schools. So that is kind of the first statement.

The second statement is that I see schools as loosely cobbled systems so there is no direct relationship between what happens in the ministers head and what is going on in the classroom. And we have as my colleague from (inaudible) we have tons of evidence of that. And sometimes we talk about that like if you have policy at the high level, that just become implemented and I think that's really a

wrong assumption because once you implement them or to improve is the practices based on certain ideas in the curriculum and it's a different way of looking at that. So the way we understand school I think is pretty important to talk about the skills. So I can give you two pictures that I can mention on the Friday morning I go out to school, out to a secondary school and let's see what the kids are doing. They are not kids, they are more the teenagers and they are solving different tasks. They are actually doing tasks that accumulate through solving a problem and so on. And the teachers are walking around to small groups and they are struggling both with the content and with the communication.

So to me that means the sometimes the split we do between the subject domains in school like in mathematics and these skills is a false kind of assumption. It's the (inaudible) that we should really try to avoid in discussion. You can imagine me sitting, I'm newly elected as the dean, going to the dean meeting and say to the dean of mathematics natural science you guys should not talk about content anymore. You should talk about skills. They would just start laughing, sorry about that. If I say that they will talk about mathematics, problems solving, intuitions and so on they would be very happy about that. So there is a question of how we ask in the education community choose to formulate the results when we talk about with the domain specialists because I really think we need the domain knowledge.

So in the Norwegian committee that I was leading we were asked to do two things. It was asked to have a plan for renewal of the subjects in the school and that's a pretty demanding task to give 10 people and do that within actually two years. So we went into a domain start mathematics, science, technology, the languages, social science and humanities and then we did analysis of how those domains are formulated in the curriculum. And the first finding we will kind of report on is that it's really too much. It's too much curriculum. We need to prioritize so that's the first finding. And that has been known for 30 years, that was not new in any way. But its, I think it is very important that we can recognize that curriculum is full of good intentions that's not prioritized and to me that's really kind of the essence of doing a curriculum analysis.

The second finding is that a lot of the content is not relevant for the kids that's growing up. It's relevant for I would say us, not even for us. It's actually backward looking so what kind of mathematics do kids need today? They probably need to understand how an algorithm would work, how

they should compute different forms of problems. The computation thinking is getting more and more important. Underlying that is really very advanced mathematics. So that kind of shows that we can't really have the split between the domain and the kind of problem solving, communication and the different types of skills. So that's one example. If you look at for example the social science they should prepare the kids for taking part in the democratic society with all the values that is embedded in that. And it's probably not a good idea to only teach them about how a municipality, how a regional system, how a parliament is built up. On the contrary to me it seems that it is way more interesting for the social sciences to engage the students in the value laden questions.

If you look at the curriculum, it's very conduct oriented. Its I would say it's pretty boring and I can understand that the teenagers don't see the relevance of that so that manes that in all the subjects (inaudible) as I am sitting here appoint and commit this through renew them to make them relevant for children, for kids and of teenagers and for the students. And I think that is really important because the subjects is constitutive of what the students can learn and I am coming from the learning sciences as when I'm not doing kind of policy work. And what we know from there is that some of these generic skills that we talk about and I think they are really, really important grow out of the subject domains. That we need to have the relationship between the content and the meta competencies involved. To just teach the meta competencies would make it very empty. So I think that is really the important message I think in our work. So and I think what is intriguing here is that the subject specialist who teaches education in universities I don't think it's that difficult to actually talk with them, engage in discussions with them and so they could also communicate the kind of the meta level of their own domains. That's in the (inaudible) question for them and I think for them that's in the intellectual intriguing issue to engage in with their students. So I think really think that is possible so I am quite optimistic about that for the next years but it will take some work to communicate the relevance of this kind of the double layer here.

The principle that we concluded with is that could sort out and solve all problems. I don't think that we will do that but it's an old finding in the learning sciences that's the only principle that you can use to sort out the curriculum is that you need to engage the student in depth learning. That has been around in learning science for the last 30 years but it's never implemented because the curriculum is

as one said in some U.S. colleague it's a mile wide but an inch deep. And that's our problem as curriculum designers. If you are not able to create a curriculum that really can foster the in depth learning processes over time and follow up that with formative assessment and see how each students progress that we will not be able to create a more advanced system that can balance the domain knowledge with the new types of skills that we need.

MS. CARE: Yes, thank you. I think one of the things that that raises immediately is, you know, it's how do you have a curriculum that can engage students and that teachers can ensure that there is depth of learning from students so it automatically lands in your (inaudible) and you have been involved in a lot of large scale support to teachers. How have you gone about that in this context around the core skills of the British counsel and so on? How have you gone about it and what are the, what do the, what does it comprise?

MS. DOUGLAS: Yes, thanks Esther. The British Council has been working to support teachers in the area of pedagogy around skills since about 2015 and we have done that in response to various conversations we have had in the countries in which we work which have kind of identified three major problems all of which you will be unsurprised to hear have been mentioned this morning. So the first is around a group of young people who are becoming increasingly intellectually disengaged with their schooling because of a perception that what they are getting in school isn't really relevant to their future lives or to their employability prospects. The second is that as technology advances, employers are wanting to employ people with higher cognitive skills but because our assessment processes are largely still focused on knowledge that teachers are finding it really difficult to move away from a focus on teaching and securing that knowledge. And then finally because information of communication technology has advanced so much that, you know, the kind of possibilities for human interaction is greater than ever before and whilst that is exciting in lots of ways people are telling us that its really, really important that young people are taught the skills to use that effectively to question what they are reading and to really engage critically with what they are learning. So we focused on six, we call them core skills, just another name to throw into the mix. We focus on six core skills, good to see that they were mentioned in the word cloud earlier on that's a relief.

MS. CARE: Lucky.

MS. DOUGLAS: Critical thinking and problem solving, collaboration and communication, digital literacy, citizenship, student leadership and creativity and imagination. So that's the why bit and over the last couple of years we have worked in about 45 different countries in Asia, in Africa in the Middle East and the UK and in the Americas. We worked with about 35,000 teachers. But your question focused on the how really so I'm going to move on to that.

One crucial point I completely agree with you is that these skills need to be embedded into the teaching of subject areas. We think that developing the pedagogy around core skills can't be at the expense of subject knowledge or indeed mastery. We believe that knowledge and skills are interwoven and when students are developing both simultaneously they learn more efficiently essentially. There is a really useful quote which I'm going to read out from I think Joe Kirby which says oh I have lost it. Knowledge and skills are like a double helix progressing in tandem from surface learning to deep learning. Skill progression depends on knowledge acquisition. So the timing of the introduction to core skills we think is crucial. We think students need surface knowledge first in terms of facts and once they have mastered that teachers can then phase in deep learning skills that test the applicant and manipulation of those facts. So one of the things that we have done in preparation for our work with teachers is that we have worked with school leaders and policy makers to look at whether there were opportunities in their current curriculum offerings to actually teach skills and the really interesting thing has been that actually in lots of the countries in which we have worked there are actually lots and lots of opportunities to already teach skills that are written large within the curriculum. But teachers aren't necessarily doing it and that's largely due to A, not feeling confident of knowing how to do it and secondly that focus on the assessment processes often taking precedence.

So back to features. Let's see if this works. Marvelous. We all know from Hattie that teachers are the biggest influences of a student performance in terms of the things that we can influence. Obviously there is a raft of research that underpins that but one of the most compelling bits of research for me is the piece that Hammershek and Rifkins did in 2006 which took 50 teachers and their study demonstrated that if you took a group of 50 teachers and you were taught by the most effective you would learn in six months what those that were taught by an average teacher would learn in a year. And if you were unlucky enough to get the worst teacher out of that group it would take you two years to learn the

same thing. So actually much of our work is focused on encouraging teachers to reflect, encouraging teachers to ask, why do I do what I do? Why do I have the habits that I have? And trying to create a culture of teachers critically reflecting on what they do and really developing as that gentleman said at the back earlier on the creativity in the classroom that can confine solutions to what we are trying to deliver.

Matthew also makes us aware and we have also discussed this morning of course the initial teacher training doesn't often to equip the teachers with the pedagogy's to deliver these skills. And then to exacerbate that teacher improvement tends to kind of plateau after three to five years when, you know, during that first initial period teachers are learning on the job and then that kind of teacher improvement tends to slow and of course that's because at that point improving pedagogy is as much as about breaking bad habits as it is about learning new knowledge and we all know how difficult it is to break a habit, don't we. Dillon Williams says about that doesn't he, the hardest bit is not getting new ideas into people's heads, it's getting the old ones out. And once new habits have been created then negotiating that informal contact with students so they can really make the most of those new methodologies.

We also know that this takes time and we know that from other disciplines as well. This graph shows the difference, different amounts of practice that different types of violinists have done, you know, it shows that those that are world class have already done 40 percent more than professional violinists and 56 percent more than semiprofessional violinists by the age of 18. Malcolm Gladwell obviously popularized that in his book "The Outliers" where he talks about the notion of 10,000 hours of study and deliberate practice and reflective practice. But it's just hard to know, isn't it, where busy teachers are going to fit in 10,000 hours of deliberate practice into what is already quite a pragmatic life. So at the outset of our work we are clear about two things. A, we need to focus on supporting teachers to be more effective, engaging in deliberate practice and collaborative reflection and B, in order to avoid this wasteful, frustratingly wasteful use of workshops and conferences we needed to design CPD that enabled teachers to actually break some habits, that enabled them to experiment with new methods, that enable them to discuss with each other resulting challenges and resolutions and then engage in deliberate practice.

Joyce Showers said that most teachers when they take on a new method try it once or

twice and then go back to the way they always used to do it. Whereas it actually it takes between 20 and 25 times of practicing something to really be able to use it effectively. So in undertaking work around the world, we have based our work on some core principles which I am going to whiz through now. Firstly intensity. Although the training packages are different in different countries around the world, there is a kind of minimum of 15 contact hours and actually in most case it's nearer 30. Secondly, those training packages are spaced so teachers meet more than once, they keep coming back. It's not a one off workshop and that hasn't been easy in all the countries that we have worked in to be honest. You know one off workshops are more usual, they're cheaper, they are easier to run, they don't impact on teacher release time and all those sorts of things but we have stuck to our guns on that and all of our teachers kind of work with each other over the course of at least a year and meet three times over the course of that period and plan action plans for when they go back know school.

The third and fourth principles that you see on there are about enabling teachers to engage in modeling and giving them opportunities to practice what they have learned and we have tried to enable that by ensuring that at least two professionals from each school are involved in our training packages so that they get the chance to go back and practice together and observe each other and look at what has worked and what hasn't and discuss it again and refine it again and keep practicing. We've then tried to ensure that teachers have the opportunities to both give feedback to each other but also receive feedback from their school leaders so that they can deeply reflect on whether a new strategy is working. We have insured that the packages are evidence based even though we have all got stacks of it in our office, I completely agree but they are correct mix of theory and practice and finally we think this is very important. We have enabled teachers to work in teaching learning communities because we think that those are really important in terms of focusing on improvement once, you know, once the training has finished and we have found that because teachers with our programs have the opportunity to engage in international professional learning communities that's been really motivational for teachers to continue with that work.

I haven't had time to go into the content of the courses so I'm just going to do a 30 second case study on one just to finish. And I'm going to do it in bullet parts because I am a bit scared of Esther. It's from the UK so here goes. Bullet points. The cross critical thinking and problem solving

specific focus was around developing higher order thinking skills. The particular new techniques that were doctored in practice you will all be familiar with them but, you know, the no hands up policy in class, the notion of and I can never say this, pose, pours, pounce and bounce techniques of questioning. Think past share approaches, hot seating, role play, mind mapping. So there were various different techniques they tried to put into practice. They mapped what happened really carefully and what was interesting was that the balance at the start of that project was about 50/50 in terms of the numbers of questions teachers were asking, the numbers of questions that children were asking. That had shifted by the end to being about 30 percent teacher led and about 70 percent child led. And they had also mapped the types of questioning to blooms taxonomy which showed that actually there was a development in terms of the questioning that children were asking. Best quote from that from a child of course they always are aren't they. We love questioning now. We're like Sherlock with mysteries. And the thing that, biggest challenge the teachers felt that they had to overcome was a fear in teachers that they might not be able to answer the questions that the teachers had to ask.

MS. CARE: Yes, no that's a lovely, yes, thank you. I think that what Susan was just talking about in terms of breaking habits, trying out new things, exploring and okay, practicing as well but that whole issue of trying new things, exploring is absolutely analogous to the world of skills itself. This is what we are looking for in students that they will try different things that will apply their skills to new context and what that means of course, is that we are interested in how students deal with non-routine contexts. How therefore do we go about assessing what is non routine? Our assessment methods pretty much based on that traditional concept of here is a content question and it's right or wrong so we can easily identify the answer. But where we are trying to look at how students develop skills to reply in non-routine contexts it becomes very, very difficult to assess those skills? And so, Alina, this is hopefully where you're moving into. It's around that innovations edge of assessment and assessment of skills so I would like to know what are you doing and what are the challenges in trying to capture these human characteristics.

MS. VAN DAVIER: Thank you, Esther. Well, it's quite interesting listening to the panel this morning and to my colleagues just before. I noticed that in all of these conversations nobody really brought up the technology that is actually around us and can be helpful in pretty much all the aspects of

the conversations. We can help teachers, we can I guess my microphone is on the right so I'm sorry for the people on the left unless I move my body. The problem solving indeed. So we need to, we can use the technology to our advantage in helping students, helping parents to know how to help students and helping teachers and help them with those number of hours of practice because it's not humanly possible to expect from teachers to do as much in a classroom but if we are able to create the right technology, we can perhaps augment what the teacher does through homework and through facilitators using artificial intelligence tutors.

So this is where my work actually is finding itself. Building platforms that either web based but more and more mobile platforms that reach our kids inside in the country and across, and around the world because what is what poor kids and rich kids nowadays have in common? Everyone has a smart phone. I mean, just look at how we started the session. We started asking those questions and getting your answers though a smartphone. So why shouldn't we try to reach out our children through the medium that is the most common accessible to them? So my approach to assessment is from the perspective of learning and from the perspective of managing the needs of the students and to go back to what it, why are these skills so hard to measure? What are the problems that we encounter when we build assessments from them? What does it mean for an assessment company like mine, ACT, many of you might be familiar with ACT test has been around for many, many years is the test, ACT test with the, you know, that leads that mission into college at least in this country.

So the question is what does it mean for attesting organization like ours to develop assessments for the 21st century skills or this breadth of skills that we have been talking about? Well, there are all types of challenges as we just heard before. The definition is still an issue. We have from different experts different definitions. How do we go about implementing an assessment if the definition -- if no -- if the experts can't agree on the theoretical definition of those skills. We still have a problem with disentangling cognitive skills and social skills. When are those compensatory's and where we need them separately? We also seem to have a problem disentangling domain specific skills from coastal main skills. These transferrable skills that we hope to be able to measure that should be relevant in across multiple disciplines. How do we disentangle that? Is a person as good of a collaborator in an area where the person is knowledgeable? Whereas it is, as the person is in an area that is new for that person. The

cross domain within domain differences.

For another challenge is how do we take into account the individual contribution from the team contribution. How do we disentangle that in a collaborative assessment? And of course there are other factors that have been on Susan's slide there about the person, the students themselves and that had the highest percent on the pie chart on Susan's slide. So individual cognitive skills, personality, gender and so on, achievement prior to an assessment. So what do we think an assessment and my background is in statistics and mathematical modeling so quite different than probably most people here. So what do we think that our potential solutions? How would we approach as an assessment organization, how would we approach this collaboration in serving our students, teachers and parents in helping bringing up the next generation?

So we, I think that one hypothesis that we need to be evidence about is the process. The process of displaying the particular skill. What they said and I will say more about that in terms of what that means. First of all, its related to everything I said before where we still have challenges. What is what we are trying to measure and what is of interest? How do we define that? And then what is the type of task or item or question that we need to develop so that the evidence that we collect is actually supporting a particular claim we want to make about our concept. But we need to focus not on a response, correct or incorrect or a self-report. I think I'm a great collaborator. Well, maybe. But the point is can you show that?

And what does it mean for an assessment company to develop tests that are actually able to capture information about the process and to provide people with feedback about that. That in question is it's related to the process information. Think of it as a little big data. It's still little because its small by comparison by what financial analysts have to work with or with what marketing experts work with at Walmart. Nevertheless its big data especially for education. We are nowadays able to track click stream information from a person interacting within a virtual system, in a game or in a simulation or with an intelligent tutoring system or even in a collaborative environment. That are big data and we need to learn how to disentangle, how can we extract the signal out of the noise from the big data.

And of course another approach we have in psychometrics is to go beyond our traditional fields and I introduced the concept of computational psychometric and I introduced that about two years

ago and what that means is we are blending the theory based assessment, theory based definition of contracts with what the data would tell us. With knowledge discovery out of the big data. So this is the definition of computational psychometrics. In terms of the message that we would like you to take from here is that if we want to build assessments for this type of skills, critical thinking, collaboration, self-awareness, metacompilation is my favorite. I haven't seen it there but it is one of my favorites and I don't really know how to test that but if we want to build assessments around these issues, we can't just go to Sten alone or to Susan by herself or to me as a psychometrician. We need all of us and we need more than what we have here on the panel. We need different expertise in each of the area that you see there on the screen is actually not just one project or one person. Each area may actually represent the full research agenda in how do we need to tackle these skills?

I want to emphasize a few things here. One is about the technology and delivery in scoring because in some instances in the world we might need to do so without the technology. And then at what point can -- are we able to do that? So at what point is the technology helping us sufficiently well so that we already have the assessment in place, we know what we are looking for, we have the supporting rubric in place, we have a teachers training in place so that we can eventually work without that technology that at this point is helping us. Another point I want to make is on the left there on the screen is a multi-model analytics and we, I had the conversation this morning that was quite interesting.

Nowadays we can use sensors, we can use (inaudible) we can use other types of data collection modalities that would allow us to lean about the process of displaying the skills. Why is that relevant? Well, imagine that we can have this opportunity and then create an automatic way to score those kids, to provide feedback to them, to identify the gaps they have. And that's why it's called multimodal analytics because it's putting, it could contain recognizing the affective states in which the students are while they are collaborating or working on the particular project. So if we are able to identify when a student is frustrated for example we can add that, the next module, instructional module accordingly. We can make it more difficult, easier, a bit more entertaining depending the age of the student.

Many of you are probably familiar with the concept of adaptive testing. This has been around for many years. Now adaptive testing, we adapt the items on the test to the ability of the student.

If the student solves an item correctly then we will give a more difficult item. If the student has an incorrect response then we will provide them easier item. Well, now imagine we can do a similar algorithm but for an affective states. If the student is engaged then you might want to give the student more of an instructional module because it looks like the student is actually able to observe that new information, the more challenging information. But if you notice that the student is struggling then perhaps you learn to scale back or provide more feedback. So these are the main messages I would like to tell to give for today and I would be happy to see what you think about is that we can actually use the technology and you can, we can also use the advances in psychometrics and computational psychometrics by including the longitudinal component of process data to help develop the assessments around non cognitive skills, around the 21st century skills and around performance assessment. So all types of tests that include these fine components are those that can benefit from this framework.

MS. CARE: Thank you, Alina. And notwithstanding some of the technological challenges there. I'm aware also that, you know, when we talk about being able to measure a lot of characteristics with log streamed data and so on, the other big challenge with this is being able to attribute behaviors to particular characteristics so whether a child for example responds to an item in a certain way online or takes longer than another child, do we attribute that to the ability of the child or do we attribute it to the fact that the child was distracted by something else or that his mouse didn't work or whatever it is and there's a whole plethora of issues that underlie technology based assessment and therefore equally what we can learn from that we need to be able to start translating into the classroom.

And if you think about it in the classroom too. Often a teacher might assess or judge or evaluate a student in a certain way without really understanding why the student has given the particular response that they have. So then we move into the formative assessment space as well so I think huge number of different issues have been raised from this. We will take any questions from the audience that you would like to raise your hands. I'm sorry, the blonde lady, I'm sorry I don't know your name and then Karina. Thank you. And then up the back.

SPEAKER: First of all thank you very much for the informative presentations. I was wondering if you could comment on the viability and the contribution of serious gaming. Serious games really feed into the ability to assess performance. It can be adaptive and I know that the psychometric

models are lagging behind so I was wondering if you can comment on that.

MS. CARE: Thank you. Next question. We will take. Karina, just up here and --

KARINA: Thank you for a fascinating presentations. I have a question for Alina. You know, from your perspective, I'm just curious, you know, if you have presented everything that has to be done and all of the different components for us to start to understand how to assess 21st century skills or the breadth of skills and I'm wondering if as you were sitting, you know, listening to your complaints and, you know, what specifically what Susan was presenting, are there things or even in this report, are there skills that you think as a psychometrician that these are the skills that can actually be assessed with some degree of reliability. There are skills that can actually, you know, where we have, we can develop assessments that work and capture change over time, change across different groups, change in different age groups and be be to actually, you know, with some degree of reliability and precision attribute those changes to as they were saying to what is actually offered in the formal education system as opposed to what, you know, students bring from outside of the classroom.

MS. CARE: And there was another question up the back, the gentleman up. Thank you.

MENTOR: My name is Mentor, I'm with Ashoka and two things a question that I want to ask is when we are looking at todays for example children, a 12 year old gets bored today and my nephew for example all the time in the phone and what Sten said that the education is focusing on yes, these lifelong learnings, right as something that keeps you joyful in life and then another one is how to be productive member so I'm just wondering how can we make sure that children we don't with all these skills just don't step onto their joy and to their creativity and to their life because many times I'm feeling that we are giving them so much that they are losing that inner joy in sense, inner like childlike behavior.

MS. CARE: Thank you.

MENTOR: Thank you.

MS. CARE: And last question up here at the front.

MS. GILES: Hi there. My name is Katie Giles and I'm with Commodix Institute. I was really impacted by this discussion this morning and the outcomes of children who are experiencing frustrations and then we talk about testing and diversity in schools, especially cross cultural. Children with disabilities, LGBT community, there are so many impacts within that community that causes

frustration. How do you suggest that we approach that from a diversity perspective or, you know, if somebody, a child or a student becomes frustrated what do we do to approach that or what would you suggest to match and meet the needs of diversity within these student communities.

MS. CARE: Thank you. All right. So we have a couple of questions that are very clearly assessment issues but I think that does not mean only Alina can answer them of course. So first of all though we might go to the serious games. Did you want to go for that?

MS. VAN DAVIER: Sure, of course. So I agree. Serious games have a good potential. We are definitely working on those. There are several, so you actually asked two questions. So one was what do we think about serious games whether they are, they can be considered for assessment. And my answer is definitely especially for learning and assessment. Less so probably for high stakes assessment because games bring with them exactly that piece that makes them very engaging is a gaming and competition like variable that may actually impact negatively some of the people will take those as part of a high stake assessment. So for that reason games perhaps are not the best for high stakes assessment but they can be wonderful environments for teaching synthesis or transferable skills.

Now the second question was why are the psychometric model lagging behind and that's a very good question. So the main reason why that's the case is that the data that we get from the process information, process of everything including in a game is that those data have a sort of dependency. What I'm doing now depends on what I have done before and what I have done before and what I have done before and if I work with somebody else, then the dependency is even more complex. It will mean not only that it depends on what I have done before but it also depends on what my partner did before. So that level of dependency is actually unmet yet at that scale in psychometrics until recently. So we at this point have to look into other disciplines experience with dependent data.

So that's what I started a few years ago and when I started to hire people with a PhD in physics with expertise in fluid dynamics for example on dynamic systems. So this is expertise that is kind of unheard of in the educational measurement but that's the type of knowledge we need to make sense of the process data and this is why it still takes time. We started, people experienced with (inaudible) networks. However they never had sufficient data. You need in order to be able to run models like that or dynamic models you need a lot of people and you also need a very long stream of sequences of

events in order to make sense properly of those data. So that's another challenge. Most of the times games, simulations have been administered to one classroom here, another classroom there but that is not sufficient for models like this for dependent data to work reliably and validly. So that's the main reason but I would like to hear what my colleagues here have to say about games from their perspective.

MR. LUDVIGSEN: I can start. I will start from the boring side. I'm not the selling argument. We just had three or four really good metro analysis and reviews out there and they come to very different conclusions than the game industry themselves. Of course the most recent one is published and the review of educational research which is the, one the highest ranked journals so that means that what stands in that journal is really true. (laughter) So pay attention to that. And what that basically says is that the games that we are seeing so far in serious games is mostly directed to root learning not to advanced skills. That's a very important finding. The other one is that it's really difficult to scale to their curriculum level so that means that you get, you use this for kind of single activities. And the third thing is that, that's the boring part it's really dependent on the content of pedagogical (inaudible). And that's kind of the oral truth for this anyway so I think that it's a kind of a promising route but I think we should also be quite skeptical and critical to what the game designers are coming up with because it's a very long distance for having fun and actually learning a concept in this specific domain.

I will add one comment to that. About the kind of data processing that we can do now so we are now talking my colleague in computer science decampment. He is concerned about having create this speed and the capacity of information. How we can increase the speed of that. We have 3-D, 4-D, 5-D, 10-D. And he has some very different questions than I have because I would say that we can't really use that metaphor for human cognition. It's not about speed. It's really about the quality of the thinking that takes time. So I think we have two kind of parallel universes here. One that is looking at kind of maximizing data which I think is an interesting idea to follow but if it don't (inaudible) that with the of the insights about human cognition that in depth thinking, this may be boring, it takes time but it actually -- what gives you the insights to solve problems and so on and be part of teams that can solve even more advanced problems. I think we will miss the point and I think we have seen that in the high number of studies that technology itself doesn't help. It's the culture, the process that's involved that involves the reasoning process that really makes the difference.

MS. CARE: One of the things to be aware of is that we can use these approaches to assessment not only to assess the students themselves but to help us understand a lot more about the skills that we are actually interested in. So a great deal of the research work that's happening now in terms of what Alina is talking about and what Sten has just mentioned actually is contributing to our understating of what sorts of skills do you need to bring together when you're interested in the complex skill set such as collaborative problem solving or if we even go to global citizenship where we need to bring a whole lot of subskills together and so trying to understand how those come together, we can start to explore that through some of these technology based approaches. I do want to go now to the question from the gentleman in the back and from the front here too about the issues around frustration and diversity. Susan.

MS. DOUGLAS: Yes. Those are the two questions that I was really interested in in talking about further, I mean, the first one I think I share the same nephew with you. We have the same problem. And I think that that's a really interesting point because one of the things that is, one of the really big challenges that I think that we have with our school systems all over the world is the fact that things become the way that we do them really quickly. Schools are really historical places, you know. In England why do we ring the bell at ten to nine? Well, because that's the way we have always done that and so, you know, a little bit about what I was talking about earlier on about trying to implicate a culture amongst our teaching profession which is about continuously looking at the way we are doing things and working out whether it is fit for purpose because what was fit for purpose last month or last year may not be fit for purpose next month or next year because things are developing so rapidly. And I think it is about giving teachers the confidence to be experimental actually sometimes and that's quite difficult.

We haven't mentioned quality assurance systems very much today but sometimes that's quite difficult isn't it when you have got quality assurance systems that judge us on our exam results and judge us on our performance in the classroom. If actually what you are trying to do is you are trying to develop new pedagogy's that might be of greater interest to those 21st century children that are out there wanting more and more and enabling them to bring some of their experience and some of their interest into the classroom to work with.

And one of things that I would just like to share with the lady that brought up the issues

about inclusive practice is that in the connecting classrooms program that I work on we work in about 35 different countries and the single most common issue that teachers are bringing up across that program is about inclusion. About how do we ensure that all our young people can access and engage in the skills agenda and that's quite an interesting debate because I think once you start to get into that how do we ensure that all young people engage and access their education is they are often similar answers whether its skills or knowledge or values or whatever else you are talking about and so again I think that comes down to enabling groups of practitioners to work together to look at creative solutions to ensuring that all our young people can be included in this type of work.

MS. VON DAVIER: I just wanted to comment on that now that you brought the last stations. I think technology definitely can help, I mean, and we have experimented with (inaudible) system for specific disabilities. We have experimented with a choice of a computer agent that will match the characteristics of the student. We have experimented with building a facilitator for particular learning or collaborative interaction in such a way that the intelligent facilitator is actually attuned to the particular disability or particular interest of the students. So those, I just want to point out that there is some hope that these systems can be more tailored to different needs so that's the main message. They are not going to replace what we are going to do in school or what the teacher is doing but they can help for those who don't have anybody else at home that might help them or they could just be offered this practice environment in which the students could do their homework.

MS. CARE: Thank you. I would like to go to just a last round of issues to discuss here. And, Sten, first to you. I think obviously the paper that your panel, your group has put together appears to defend the idea of inter disciplinary and that skills can be integrated through the curriculum. How are you or how is it going to happen that the people of Norway are going to be convinced that traditional content and knowledge domains are not going to suffer?

MR. LUDVIGSEN: Wow, that's a -- I will start with the simple response. It's explained in the reports and the teachers like the report and they think it is possible so that's a very first important step. No, I think it is really a challenge and I don't think we need to jump to conclusions about how productive to be at work in a disciplinary environment can be so what we have said is that for example on the sustainable development that it obviously different issues involved. This from the bachelor of

sciences and chemistry, biology, physics and so on, for the social sciences obviously how to share resources and there are certain ethical concerns involved.

So we don't believe that you can put all those domains together. We think that the students have to be exposed to elements during all of their longer periods of time and that they work to combine two or three of those domains when they work with sustainable developments. Because there is very different kind of ideas in those if you work with the national science problem you can for example use simulation tool to see what happens if everyone is as well off as Norwegians and drive our cars the way we do. It's not sustainable after all. So we can do different, use different tools to kind of simulate how this will go on but that's then the question that they involve understanding with statistics of very complicated processes but also and so on. I don't think you can easily match that to ethical consideration so we will have to be said that over a three year period the curriculum inaudible should integrate not more than three elements but over the whole K-12 period you can have a curriculum model that actually carried that so the students can be exposed to all elements in that. And we did a, we did the physicist was writing a report for the commission and he was kind of testing that out in a very kind of a simple version and we would argue that if you're really deliberate in how we design the curriculum and not try to integrate too many things at the same time I think that would be possible.

But it's the pen that the students work with for example inequity skills across the different domains. So that it is subject to knowledge involved but the inquiry skills are some kind of a metaskill is really the most important issue to cultivate over time and that's, I think what the students will really remember anyway after being exposed through all the domain time so it is certain skills that we will make sure that is part of the curriculum design and that there is time enough to actually work with those skills.

MS. CARE: Right, thank you. That immediate raises a question around the teaching and teacher training. So if skills such as inquiry skills are to be developed then I would assume that we need to have a lot more interactive pedagogy's in the classroom and so, Susan, given the work that you've been doing with teachers, what are the implications of this sort of approach in classrooms were you might have 50 students in very packed conditions and we have those, the stress of as Darius again was saying before of getting through the curriculum. So how does it translate? How does all this translate into those sort of realities?

MS. DOUGLAS: So I think from our perspective the first thing that to say is that we are not selling an answer here. There isn't an answer. I mean, I wish there was but I don't think there is. I think that we, what we are trying to encourage is an approach more than anything else. And that that approach therefore will be different in different places. It will need to be contextualized so one of the things that, you know, I didn't get a chance to say earlier on is that actually the training packages that we offer are contextualized for the different places in which we work. They are delivered by local people. They are not, you know, it's not somebody that's coming in there, they are actually changed and adapted to suit the circumstance.

I have only described one kind of strand of our work and, you know, you have identified three things here that need to happen, you know, together in order to create change but we also think that in order to actually secure change you need to secure change in terms of policy and practice and also culture so I think that, you know, we are not working in isolation in the places that we are working. We are working with the ministry in line with their priorities, with local people who are contextualizing things and encouraging an approach where teachers are looking at creating their own solutions and looking at creating solutions that suit 50 children in the class or that suit a very high status exam system, you know, actually you have still got to pay attention to the fact that children have actually got to get through that particular examination. So it has got to be we think driven from the ground in order to create a solution that will work for the particular context. So I think it is about approach.

MS. CARE: Yes. Because the same question of course goes toward assessment, you know, notwithstanding the technology solutions and use of technologies to explore the skills and our understandings of them, how soon can we translate our understanding of the skills that's derived from those technology solutions into classroom practice. You know, how soon can we have ways where teachers effectively can be assessing students in the classroom in a way that be used to support their further instruction and so I think that is for me one of the really big questions. Do you have some views, Alina?

MS. VAN DAVIER: Well, yes, I need the glass ball. It is hard to say how soon and there would be different levels. So and there would be different approaches for different groups of people. For example, we might create products that will be our web base will be mobile and then with that make them

accessible to a lot of people but those products will probably still be very narrow on specific elements so collaboration only or so something that is relatively narrow but still useful for a large group of people. That could for example be used all over the world. That wouldn't be definitely alone and necessary to function by itself. How soon even to have that I would say probably a few years at that level. I don't think we can have anything sooner than that and I think part of the reason why they say games have not shown a good result all the time is because they've never really been tested that scale. So we actually don't really know how to generalize the claims that have been observed. Even in the very good situations.

So I wanted to talk about how much evidence we have because I really like that conversation earlier this morning. We do have a lack of evidence about games but it's all very restricted evidence. It's almost descriptive so you can generalize from it and that's true for a lot of these innovations. We actually don't really know if those really work. If we look at five groups of people with three, you know, three people per team, the only thing we can say at the end is that Johnny does that and Mary does this but we can't genie to Alina and Susan and Sten and Esther. We have no clue. So yes, there is a lot of evidence but that evidence needs to be at a scale in order for us to make meaningful conclusions.

MS. CARE: I mean, at some levels it sounds depressing. The reality is that education systems are moving. They are moving into this space. They are reforming their curriculum, they are thinking about new assessment frameworks. They are starting to think about different pedagogical approaches and this is going to happen despite lack of lovely research that might take a few years or 30 years. So I think we are all just going to be jumping right into it and I think the challenge for many of us who are working at different levels globally, regionally and in country is to get as much research done as we can in the classrooms, find out how teachers are responding to the imperatives of their education systems and hope that we don't make too many disastrous mistakes. And again I know that's sounding a little bit negative but the reality right now is that we don't have a great deal of information about how to teach these. We don't have a great deal of information about how easily students can acquire these skills through a formal education process. And we don't have a great deal of information yet about how we can capture student skills in a way that we can feed it back into that teaching and learning process. And so

this is why going back to the pathways to reform, pathways to learning, this work is incredibly important for us over the next few years. Glean what we can and to feed that back into country, regional and global systems so that we can make good decisions for our children in the future. Thank you very much to the panelists.

MR. LUDVIGSEN: Thank you.

MS. VAN DAVIER: Thank you. (Applause)

(Recess)

MS. CARE: Thank you very much. Oh, great. So welcome back and welcome to our online participants, as well. I don't know what it must be like being online and sort of seeing talking faces, but I hope that it's holding your attention.

This morning we focused mainly on the global and regional issues, as well as doing a little bit of a dive into those issues around definition and what that might mean. This afternoon we have a different set of sessions and we're going to start, my colleague, Dr. Helyn Kim, and I are going to provide an overview of the analysis of the information that we derived from the qualitative survey work that's been undertaken. Helyn led the overarching analyses of the data and we're also very grateful to our co-authors on the report, Kate Anderson and Emily Gustafsson-Wright. Once we finished this sort of brief overview, we'll go into our first panel for the afternoon that will be chaired by Dr. Connie Chung, and that will be bringing the country representatives to the fore.

So these four countries that you can see sitting up there, they're all obviously in very different geographic spaces and they're also in very different spaces in terms of reform and reform agenda. And so we'll talk about that a little bit.

One, there's some very sort of basic statistics up here, not all of them the most recent, like not 2017. But nonetheless, it gives us a little bit of a picture of the differences across these four countries. So I think one of the first things to notice is the very large differences in population where we go from 122 million in Mexico down to 47 million in Kenya.

The other interesting things, I'm sure each of us could see something differently interesting about it, but for me we can see that the population in Kenya is growing rather more quickly than in the other countries and that we have a lot more school-aged children coming through,

comparatively.

The other thing that's interesting you can notice that the unemployment rate in Kenya is somewhat higher than for the Philippines and for Mexico, but nowhere near the unemployment rate of South Africa. And so these differences across countries have made an impact in terms of what happens in the education sector, of course,

So it's one thing to look at those statistics and country characteristics, but of interest to the people, the people are the ones who carry the burden of the change. They're the ones who propel the change, drive the change. And they're the ones who need to live with the consequences of the change. And so it seemed a very natural thing for us to look at what are the views of stakeholders in these four countries? What are their views about education? What are their views about the reform agenda in each of the countries? And what are their views about a skills-based type of curriculum?

And so in each country there were interviews and focus groups carried out. They were carried out with parents, in some countries with community leaders, with teachers, teacher educators, middle-level people in the education systems, and policyholders. So the fieldwork was led by QRS, which are based on South Africa, and they also coordinated separate teams in each country going into different areas within each country.

I'll say it probably again a little bit later, but just to be aware that this was a set of qualitative work. We can't really regard this as representative of country, and it was very much within particular areas of each country. So that's just something to be aware of.

MS. KIM: And I just want to mention again that the interviews and focus groups were centered primarily around two questions of interest. So the first being what are the skills you associated with a successful person? And what are the skills that are important for children and students to develop?

So five main themes emerged across the four countries, and these have to do with consensus on the important skills, a distinction between skills and success, the differences in perceptions and attitudes depending on proximity to the learner, the role of context, and some of the challenges and issues faced by countries.

And I want to note here that these themes are not entirely distinct from the other. In fact,

you'll notice they're interrelatedness in the findings we present not only in our report, but also in some of the examples that we will provide today.

So to begin, our data indicate that there is consensus on the importance of breadth. All four countries agree that it is really important to develop a broad range of skills in their students in order for them to succeed and thrive in today's society. Countries identified a wide range of skills, including collaboration, communication, problem-solving, social and interpersonal skills, and so forth and so on.

However, how skills are conceptualized, how they're defined varies widely. So in addition to the skills that I just mentioned stakeholders in all four countries are identifying having good morals and values, being resilient, being a positive role model as important skills. And I think this brings up a larger question as to what do we mean when we say "skills?" And relatedly, what implications or consequences might there be given that there are such different conceptualizations of skills across multiple stakeholder groups?

MS. CARE: This graphic is very useful for us and I'm sure many of you have seen it before. That's an OECD 2030 framework. And it captures a lot of what we've been talking about today, as well. So we have this bringing to the bear knowledge, skills, attitudes, values, leading to competencies, leading to action. I think it's actually a very clever graphic in terms of capturing that, but it also makes very clear how difficult it's going to be to try to capture student competencies when there are so many different strands that have to be connected when we're working together. So I think that's a nice way of sort of picking up some of our conversation this morning, as well.

In terms of Helyn's second point about what are the consequences if there are differences in conceptualization of skills, I think it's just like anything, you know, if we have different definitions of things, it makes it very difficult for us to communicate about them. It makes it very difficult for us to be on the same page and have the same goals.

And so if we have education systems that are adopting a broad range of skills underpinning their curriculum and if that education system assumes that those aspirations are going to be acted on in the classroom, then parents also need to understand that. Because the consequences of bringing more skills into the classroom are that we're going to have a lot more interactive pedagogies operating and that we're not going to see teachers sitting at nice little desks being very studious and very

quiet.

And so, you know, if you just think about your own children coming home and saying, oh, you know, we talked in groups all day and we solved problems or we solved puzzles, if you're a parent who hasn't stayed in the education system, if you're a parent who maybe left school yourself when you were 13 or 14 or 15, it might be very difficult to accommodate that view of education today with their view of academic subjects being the main thing, of students listening and doing what they're told and writing out tasks. So it's very important that we have the parents on the same page as the education system if the parents are both going to support their students in what's happening in the school.

So one of the main findings that Helyn mentioned before is that what we found from the views of the stakeholders across the countries is that the schools that they identified as relevant to success, whatever that might mean, are not the same the skills that appear to be highly valued within or for the learner. There was overlap. I mean, there's no doubt that there's overlap between these two things, but overall we find workforce and societal characteristics are associated much more with success.

So I think often when people think about success they're probably talking about the adult or the young adult, for example, whereas we find the 21st century skills, things like the problem-solving, creativity, and so on, are much more identified as the important skills for learners. And that pattern, that pattern of similarities and differences, is most pronounced for parents and for teachers.

So success seems to have meaning beyond a collection of just specific skills. Success is things like providing for your family, being responsible, being a citizen, giving back to society. And these sorts of things came out across all the countries, but to greater degrees in some than in others.

So I think, you know, it's a question about whether the difference of having some skills for success and other skills for education, whether that is about a disconnect between what we think education is going to provide and what the world demands of our students because, again, education is about equipping our students to out into the world.

So we're going to -- you'll find, as Helyn mentioned before, that a lot of these things are interconnected. It's not really nice and clean as we go through. But before I proceed, I want to make that point again that the data that we have here, for example, we've categorized the data from the interviews and the focus groups, and that was quite a difficult process. And so when we see these nice little dots

and shapes, we should not ascribe to them the same I guess robustness necessarily as we might if they were really nice numbers that were derived from a very nice, scientific study. So we're capturing a picture of the countries.

MS. KIM: So to add a layer of complexity to what Esther was just saying in terms of how the skills that are highly regarded may not necessarily be in line with those directly related to success or contribute to success, the perceptions also differed depending on the stakeholder group's proximity to the learner. So if you look at the figure sort of behind me you'll notice that when we are talking about proximity here, we're referring to how closely or directly that particular group works with the child on a day-to-day basis.

So you will see that parents and teachers sort of have more of that direct influence on the student. And then as you move further away, we have student administrator -- or school administrators, teacher trainers and lecturers, nongovernment and government personnel, who are having more indirect influences on the student. And as groups move further away from the learner what is most valued also shifts from a focus on personal attributes, on the skills that have to do with individual students' success, to characteristics that are linked to broader societal roles.

So to provide an example, in Kenya, we noticed that parents and teachers really emphasize the importance of workforce and society characteristics, as Esther just mentioned, especially job readiness, being independent, being able to provide for one's self and one's families. And then the more removed groups heavily emphasize the 21st century skills or what we typically think of as 21st century skills, especially communication, collaboration, and problem-solving.

And this pattern is not unexpected, right? Because these stakeholder groups have different roles and they're part of different learning environments. And so, of course, they're bringing different perspectives to the picture. So parents and teachers, they see the child almost every day, they're working with the child, and so they're seeing various aspects of that child beyond just academics, beyond just a small facet, to think about the whole child, what that child brings. And so naturally, they would be thinking about that particular child's success not only in school, but also beyond school.

On the other hand, when we're thinking about the groups that are a little bit further out, such as government personnel, they're thinking about characteristics that are linked to the goals of the

country, to the betterment of society, and to developing citizens who can really contribute positively to society, which is very much in line with their roles and services that they provide within the education system.

MS. CARE: Yes, one of the things that I found particularly interesting was the difference within the education system, so the difference between teachers' perspectives and the mid-government level people. And a question then arises, you know, even within an education system, are the different parts of that system operating in different silos. And if they are, why would that be the case?

And so there are a couple of points about this. One is that differences can occur due to assumptions at policy level that information sifts down; that, for example, if a department or a ministry issues a memo that it's going to go right through the system, that it is going to penetrate through the regions, the provinces, down to school leadership and down to teachers. And I guess one of the things I would do is question whether that, in fact, happens.

And if we think back to the NEQMAP study that Ramya was talking about earlier today in the Asia-Pacific, in that last study around assessment of transfers of competencies, when we asked very similar questions of top-level policy people in education versus the middle-level education bureaucracy and the school leaders and then the teachers about what resources were available and what training was available, we got very different answers. So, I mean, I'm sure this happens in any large bureaucracy. And if we think about any of these countries, their education bureaucracy is often the largest bureaucracy there is in the country, so there's a great deal of potential for information not getting everywhere that it needs to get. And particularly when we're dealing with a reform that, you know, it's a little bit vague, a little bit nebulous, then there's even more opportunity for not everybody to get the same information. So that was one point.

The other point is going to Helyn's comment about proximity. And I think it's one of the things we first picked up in the data, these differences across the stakeholder group according to their removal or remoteness from the recipient, the user of the information. And this is about the focus that each of us has on our own work. And so if you think about middle-level policy people, their focus is on inputs. What do they have to provide to the system to make sure that the system is going to operate okay? Whereas if we think about the teacher, the teacher is thinking I'm going to walk into that classroom

in a few minutes and what is it that I'm going to teach to these students? How am I going to cope with these students? So a very different focus. And that also might have some implications then for these very, very different perspectives that we get within levels, within education bureaucracies.

So those differences between teachers and other education system personnel, we see these differences across countries, right, across all four countries. But, naturally, the countries differ in many other ways. And one of the I guess second big pickups that we had was around how the context of the country takes a lot of its priorities and what is happening in the education space in the country.

So, for example, we'll take the Philippines. In the Philippines, as in many countries, education is highly valued and teachers are highly valued. Being highly valued, of course, doesn't mean that people are well paid, and this is also something we know globally. You know, valuing teachers is not the same as giving them great conditions. So if we put that aside for the moment, notwithstanding, in the Philippines the teachers are very highly valued. Parents also value academic skills, but they also value the sorts of family values, citizen values that Helyn talked about; sufficiency providing for your family.

So in 2013, when the Philippines brought in their most reform, which later one Dr. Bustos will talk about, there were many aspects for that reform, but one of the aspects was to increase the number of years in the basic education sector. So up until 2013, the Philippines basically had a 10-year system, and the education reform in 2013 brought in another 2 years, years 11 and 12, to make the country at a level similar to other countries through Asia and Asia-Pacific.

So notwithstanding that there are many reasonable drivers of that big change, a big structural change, the immediate consequences for families is not necessarily positive. We're talking about a country here where I don't know the absolute accurate percentage, but something like 30 percent of the gross domestic product is around small to middle enterprise, family businesses. And family businesses employ, often, their own. They employ their own children and their relatives.

So as soon as we have an education system saying, well, it's really going to be better for your children to stay in education for two more years, this has an immediate repercussion for family, it has repercussion for their socioeconomic health. Although they might understand that in the longer term there are going to be benefits for all, in the short term there are some immediate issues. And so we see some of that coming out in the stakeholder views. All right? And so in every country we'll find that

particular context has some implications. Yeah?

MS. KIM: Yeah. So similar to Philippines, we -- also context plays in a critical in South Africa. Across all stakeholders there really is strong emphasis on workforce and society characteristics. Again and again that comes up very frequently, especially job readiness, technical and vocational skills, and citizenship.

And as Esther mentioned earlier, South Africa has a high rate of unemployment and this is especially pronounced for those ages 15 to 24 years old. And so making sure that students are well-prepared for the workforce is of great importance. And this idea permeates through the stakeholders' perceptions and attitudes about skills.

In addition, stakeholders in South Africa often brought up desires of equity, inclusion, diversity, which closely mirrors the country's goals of addressing apartheid's legacy of inequity and really understanding that in order for the country to meet its goals, it's not something that can be achieved by a single individual, but really takes collective effort, where all citizens are contributing positively to society.

So Esther and I provided a couple of examples here where context does play a really important role in much of responses that we received across stakeholders. However, countries are also facing some similar issues regarding the focus of education. So there is perceived tension across stakeholders groups between providing education that is focused on holistic development of the learner and one that is focused on access the more traditionally valued academic outcomes.

And this is not a matter of knowing whether or not it's important to develop a broad range of skills. So teachers often express desires to teach a wide range of skills. However, they also recognize that the current infrastructure really restricts opportunities to do so in the classroom.

So, for example, as Darius mentioned actually earlier this morning, you know, teachers are feeling the pressures to complete the curriculum within the school year. They're feeling the pressure to prepare their students for exams because that's how they're being evaluated. So even though teachers value student-centered approaches, they really understand the importance of involving the learner in their own learning process. Realistically, lecture style teaching seems to be the most efficient way of teaching within the confines of the current system.

MS. CARE: Yeah, so what we have here is, you know, a focus on tensions, that shifting

the focus is going to cause tensions and is. We're already talked about parents being required to value new directions in education. We have teachers, and I'm sure that's at the forefront of many people's minds, where teachers will recognize the need for new areas of expertise, but may themselves feel inadequate or not well prepared to teach the sorts of skills we're talking about. And, you know, if we read the global literature, we find, of course, that this is particularly in the case of ICT, that many teachers feel that their students have way surpassed them in that particular area. So that skill is sort of one that is right up there, but it's equally true of many of the other skills that we're talking about; that if we have teachers who have been trained in a particular discipline area, how do we help them make that transition to be much more explicit about how they can use those discipline areas to promote and enhance the skills and their students.

And, of course, there are tensions around assessment. And we see a very good sort of example of old-style assessment up here, where we have a group of either grade 1 or prep students who are being rated, you know, to minute extents. And so the tension in us moving an assessment culture away from ranking tables to use of assessment as a phenomenon for good is one of the big challenges that we see here.

MS. KIM: So to conclude, you know, through this research project we have examined the attitudes and perceptions of key stakeholders regarding the importance of skills. However, identifying the particular sets of skills that children need to succeed is not enough. And we heard over and over again this morning that it's no longer about the what, it's now about the how. And we really need in-depth understanding about how these skills develop, how do we teach them so that they can be applied to new and different situations.

And having had the privilege of working with the four countries, even to a limited extent, provides a way forward for sharing. And we want to really reiterate that, you know, the idea here is to learn from each other, to learn what's going on in these other countries because we are all facing, you know, similar challenges regarding the development of skills.

So we want to thank you all in advance for reading our report or executive summary.

And as we conclude, I want to invite Connie Chung, who will moderate the next panel, and also the panelists to come forward. Connie Chung is the associate director of the Global Education

Innovation Initiative at the Harvard Graduate School of Education. She conducts research about civic global citizenship and 21st century education.

Among publications of particular interest for the topic we are discussing today is her co-edited book called, "Teaching and Learning for the 21st Century: Educational Goals, Policies, and Curricula From Six Nations." And we are very, very grateful to have Connie chair the country panel.

So thank you. (Applause)

MS. CHUNG: Good afternoon everyone who is in this room and also watching us online. It's a pleasure to be here and the report is incredibly interesting and wonderful to read so I'll reiterate the requests just to say that it was -- quite informative because I think a lot of us who work in education have an intuitive sense that the stakeholders have different perspectives but this is one of the first studies that I've seen that actually documents the degree to which there are different perspectives around, what should be considered good traits for success and all those kinds of things. I'll start with that.

And one of my other tasks as a moderator is to remind the audience and those of you who are watching the webcast to follow the conversation on Twitter using the hashtag #breadthofskills so I'll just get that out of the way first before introducing our wonderful panel that we are going to be hearing from and so I am just going to do a very simple introduction of their names and titles and then what I've asked them to do is actually -- given the fact that some of the challenges that this report reveals also this conversation around what should we be teaching students is the notion that the world is fast moving and quickly moving and so as we are teaching students for this world now, 30 years later when there are adults or 20 years later, will those skills still be relevant?

So what I've asked the panelists to do is say quickly in 30 seconds what (inaudible) have learned in schools that they feel they are still using now in these incredibly important sounding jobs. So to my immediate left is Mr. Darius Ogutu from whom you've heard this morning and he is a director of policy partnerships in East African Committee Affairs and a minister of education in Kenya and then next we have Daniel Hernandez who is the academic coordinator Under Ministry of Higher Middle Education in Mexico and then we have Therese Bustos who is the dean of the college of education at the University of the Philippines and then finally we have Mathanzima Mveli who is a director general of the Department of Basic Education in South Africa so actually, Daniel, if you wouldn't mind starting with your story about --

something that you learned that you feel that you are still doing, practicing in your job today.

MR. HERNANDEZ: Thank you, Connie. At age 7 I learned from my teacher, the best teacher I ever had that determination and effort was critical for my success in life.

MS. CHUNG: Okay, Darius?

MR. OGUTU: Well, my most memorable days in schools, I think, were in my English classroom and this is because my teacher was more or less like my grandmother and she allowed us to make noise in class. She allowed us to sing, dance and do stuff that other teachers didn't allow us to do. Essentially, she made us learn through play and up to this time, I remember her fondly and maybe that's one of the reasons why I became a teacher and an educator.

MS. CHUNG: Wonderful, thank you so much.

MR. OGUTU: Thank you.

MS. CHUNG: Therese?

MS. BUSTOS: Mine is not exactly a skill but I think I learned flexibility and to be resourceful in school. It's not so much of what the teachers taught me but what the environment taught me so I guess in the talk about all of these skills being part of the curriculum. Environment really has to be taken into consideration.

MS. CHUNG: And again, as we kind of talk about how broad the breadth of skills have become, one of the underlying questions is what exactly falls under the responsibility of the schools versus lots of other places where young people spend their time and I think that one of the earlier reports that Brookings actually produced talked about these multiple layers of environments and hours that you have people spend and so which skills, for which environment and whose responsibility, I think, is an underlying question to all this.

MR. MWELI: Well, thank you very much, Connie. What I remember is that from my very early age, I liked teaching, even before I got to train and qualify as a teacher, including helping other students that were in higher grades than the one that I was in but I never wanted to become a teacher but I got to love teaching ever since then and (inaudible) as an administrator, I still behave like a teacher.

MS. CHUNG: That's wonderful. So again, these people with incredible titles and having tremendous responsibilities were once young kids who were influenced quite well by their teachers so

we'll start off with that and so just diving into the report next, it seems that the skills that are being emphasized in each country as Esther and Helyn explained is dependent on contexts and the challenges and the needs of the moment, including what you are thinking of as far as priorities so could each of you, I wonder, talk very briefly about which skills are being emphasized in your country and how that speaks to your contexts and priorities. We'll just go down the room.

MR. OGUTU: Okay, in the context of Kenya, the main skills that we are emphasizing currently are literacy, numeracy, and some elemental digital awareness and these are key for us because over some time now, children go through the system and go through the levels but they do not learn basic competencies. They do not acquire basic competencies so it's not uncommon to find somebody who is going through the system but they are not able to read or write as expected so for us, the basics in terms of literacy and numeracy are critical for the children to acquire so that they can be able, at least, to go through the rest of the levels or the curriculum with a certain level or standard of understanding and then the issues of digital literacy.

We are trying to accustom our children to the realities of the use of technology and most of them find this quite interesting so issues of using tablets, using mobile technology and integrating this in learning is proving to be quite popular in a number of our schools so we are in a small scale, trying out these as we train teachers on how to integrate ICT in teaching and learning.

MS. CHUNG: Yeah.

MR. HERNANDEZ: Thank you, Connie. Mexico is engaged in the launch of a new educational model and this is something that the country needed for decades basically. What we have been doing is reviewing the curriculum actually to try to align it between the different educational levels, primary, secondary, higher and middle education.

Second, we have reviewed the curriculum in order to improve relevance and that basically means to take out a lot of topics that history had put there over the years.

By doing that, we expect to see the opportunity for teachers to develop deeper learning in their students and to develop some interdisciplinary practices so that students can engage in critical thinking and mathematics and then bring that to sciences, for example. We have 11 areas in the new curriculum. Three of them are related to content, disciplinary content, literacy and communication,

mathematical thinking and the exploration and understanding of the natural and social work and I want to emphasize that we are putting their exploratory understanding because that's kind of how we are introducing skills like analytical thinking into the curriculum.

Then we have critical thinking, problem solving, social and emotional skills, which is something that our society is very much engaged in because we are looking for a society that phases critical problems of violence basically so we are very interested in dealing with social and emotional skill and collaborative and teamwork related for the job market.

And then, obviously, a society as diverse as Mexico needs to think in diversity, tolerance and citizenship, arts appreciation, health and personal care. You saw the numbers, how much youth we had in Mexico so we need to prepare them for a changing world in which health is an issue, environmental care and digital skills -- digital skills are not only the use of ICTs but also the management of data and the analysis of the data that you get through all these new technologies.

MS. CHUNG: Thank you.

MS. BUSTOS: So the Philippines situation is pretty much the same as Kenya and also Mexico. We are the last country in Asia to add two years to our education system so now we have a 12 year basic education system. Now the intention is that hopefully students after going through senior high school, they'd be able to find employment so they would have skills or they'd be able to open their own businesses so they have entrepreneurial skills or they can go to college.

Now, having said that, there is also renewed emphasis on literacy and numeracy in the early grades because we believe that all the other 21st century skills are really based on literacy and numeracy, like development on -- like being able to read so that you can read the situation, think critically about the situation so those things are very important to us so we are looking at the situation from both ends. At the very young age where children need to be literate and numerate and also the two last levels where we want them to have information, media and technology skills. Learning, critical thinking skills and we also want them to be able to communicate and collaborate. That's how it is for the Philippines.

MS. CHUNG: Thank you so much. Mathanzima?

MR. MWELI: Thank you, I wouldn't like to repeat what the other three colleagues have commented and we also emphasize on foundational skills of literacy and numeracy because we believe

those skills are not only important but indispensable because all learners will have to rely on them to acquire knowledge and skills as they progress in their schooling and even post schooling but maybe to add what has not been shared, particularly for South Africa. Well over and about, the fact that we've got a high unemployment rate indicates that it's the ages, particularly between 15 and 24 and our curriculum focused over many years has been in the main academic, in other ways providing for the academic stream to the detriment of your vocational stream and I am sure I'll have the opportunity to explain more as to why we are going quite radical in what we call the three string model in South Africa.

It is not only important in changing the gear but also to create a safety net for young people in our country but I also need to mention that of the millennium development goals, sometimes referred to as principles to determine the performance of any education system and five of those, which is access, redress, EQT, efficiency and quality, South Africa is doing well in three.

In terms of access, we almost have universal coverage. We've got 99 percent of young people who are supposed to be at school, were attending school and in terms of the second one, redress, for instance we've got what we call proper policies implemented by government where parents are not expected to pay school fees. So because of that 99 percent, as I said, only 60,000 learners or young people in our country are not attending school but the rest are in school and also, in terms of equity, you've got more girls attending school and more girls who -- in fact girls do better than boys, both from primary school up to secondary school.

I must also indicate that we have increased the level of output in our second area school from 48,000 to over 400,000. Universities are unable to cope in South Africa and that's why you experienced what would have been seen in the media circle as Phismas Four. Part of the reason is because universities are the only post schooling option. They are the only viable option in South Africa.

We are working as part of Africa and the region to make sure that colleges come on board to assist, to absorb more and more young people and we also, in terms of our curriculum, we've gone through five curriculum changes in South Africa over 23 years which has been quite bumpy and destabilizing to the education in South Africa but fortunately with the last five to eight years, there has been some stability wherein the curriculum emphasizes on high knowledge and high skills.

It's for that reason that we focus on five critical skills which are problem solving, critical

thinking, creativity, innovation, teamwork and social justice and human rights. We strongly believe that these skills are inextricably intertwined with subject domains. We don't see the two as distinct, in fact, we see them as complimentary because we believe that you can only demonstrate knowledge by also using these skills so briefly, that's where we are as a country.

MS. CHUNG: Thank you so much and that's a perfect segue to the next set of questions which, as Darius kind of -- definitely said this morning, research, we are drowning in research. It is the implementation that is sometimes the issue so I wonder if our panelists could talk about as you continue to focus on subject areas while realizing that there needs to be a shift in focus around some of these broader sets of skills, what kinds of things have you seen happen in your country as you try to implement these changes, including opportunities and challenges and I wonder, Therese, if you could speak as a dean of college education around, what you are thinking is around teacher education, school leadership education as you are looking to marry those two areas to the fact that most people seem to be recognizing there needs to be a broader range of skills that need to be taught.

MS. BUSTOS: That's right. Well, I guess the University of the Philippines is quite unique because it's the national university and so we get the best students, however, I would have to say that for the field of education, it does not really attract the best of students and so the situation in my college is not the situation outside and so we end up having teachers who really need help implementing all of these reforms that we would like to see in the field and I guess in terms of teacher preparation, that has been a challenge. Yesterday, I was saying that in many cases, we are asking teachers to teach skills that they did not learn themselves, skills that they don't have themselves and so how on earth will they be able to teach those skills and so what happens is we come out with curriculum teaching guides that are so prescriptive that I think kill their own creativity, kill their own levels of critical thinking and so there is this tension now so what do you do? How do you produce at least teachers whom you can trust to teach things that would achieve the (inaudible) goals and so that is where the challenge is, I think, for teacher education in my country.

Teacher education has to become more attractive. It has to attract really the best and brightest but seriously, with the conditions that are present, the working conditions, they don't attract the best. The best go elsewhere and yet we do have, as a country, very lofty goals that we want our teachers

to implement and so I think for my country, that is a challenge so how do we get past that?

Well I guess I don't know how it is with the other countries, probably the situation is the same. So Darius, as a former teacher yourself, I wonder if you thought about this question?

MR. OGUTU: Yes, the challenges are more or less similar in the sense that we do not get the best to join the teaching profession but I know that -- this is my own personal opinion that the ones we have are the best for the time being and we need to make the best use out of them and so -- because technically we have over 250,000 teachers, you are not going to get 250 new teachers again. You have to work with this 250,000 teachers that are in place and they've produced highly skilled learners in one way or the other so they have something in them. They only need our support maybe so that they can do better than they are doing and we are trying to do these through the systems, tweaking around with the system and seeing how we can work on the issues of the reforms that we are talking about and as we focus on issues of science, technology, engineering, arts and mathematics, we are also remembering that, as she said, they may not have been trained on it but they can be supported so that they can support the children and we are now also considering introducing vocational education and training to junior secondary so that children are able to be accustomed to other possibilities so that they don't think that to be successful, you only need to go to university. There are other midlevel trainings that can be taken.

And we are helping the teachers to identify the learners' talents at the earliest possible time so that they can be nurtured and they can be trained on those talents and they can be able to develop further on it. Kenya is a country of world champions and Olympic champions, I keep on saying but these champions become champions because they are identified early in their schooling life and from the time they are maybe 8 years old, 9 years old, they are already practicing the marathon or cross country or 800 meters.

By the time they reach 15, 16, 18 years, they are world champions because they have been doing this all their lives. Why? Because a teacher somewhere identified them and nurtured them and this is what we are pushing and we are also bringing in another aspect of service learning so that even if you are going through education and you are in the system, you are still part of the community and you have to look at how you can contribute in whichever small ways to community and then the whole

aspect of values that going through an education system without any values, then you cannot be a constructive citizen in the country or even in the world and we are instilling these values from the earliest opportunity possible and we hope that with age appropriate content, this can be done across the board. It's not only in one subject but it's across the curriculum, that every teacher has a responsibility to instill certain values in the children and when we do this collectively, then we are able to produce children whom we can be proud of and say yes, this is a 21st century citizen that we are looking at.

MS. CHUNG: Thank you very much. Daniel, one of the questions I might have is that curriculum development and change is partly about what needs to be taught but it also happens, as we learned earlier in the panels about the political environments and as you have an election coming up in Mexico next year and as you are implementing and making these changes in the context with political environment, I wonder if you could speak about this question around implementation challenges and opportunities with that frame in mind as well?

MR. HERNANDEZ: Thank you, Connie. Obviously, when you launch a new educational model about two years before the new presidential election, there are concerns about how much can be done but when you have been in the educational sector for some years, you know that two years is a lot of time. What can be done, for example, we have been working on social and emotional skills and what we have done is try to develop activities for teachers so that they can introduce them in their curriculum development every day basically.

These are activities that take 10 minutes. The way that we can enhance these activities and establish these activities as regular activities for teachers, we can be sure that changes will happen, whatever happens. The second idea that we are trying to disseminate is that skills beget skills. As I showed yesterday to some of you, we have data that showed that students that have higher levels of social and emotional skills are also developing better academic scores. This is a causal link basically; it's proven by statistical models but as much as we can develop this idea also, we can be sure that change can be established. The third thing is teachers' training.

We have launched a very strong new teachers' formation program that tries something that -- I don't know if Esther or Susan talked this morning, about -- that skills development needs a more interactive pedagogy and that requires a new form of teachers' formation, a form that introduces the idea

of interactions as relevant as respect for students relevant (sic) and in that way, we are training and we have done that with 25,000 and we hope to reach another 75,000 in the next couple of years, at least in higher middle education in new ways of interacting with students through courses based on videos, on class observation with interactions on -- general interactions, math interactions, communications interactions and general interactions so we think that if you start change, the change, two years can do a lot of things -- in two years you can do a lot of things. The problem is when you stop and think well what is going to happen in two years. Well whatever happens, you can promote change and start change in this time.

MS. CHUNG: All right, thank you. Mathanzima, can you talk a little bit about the teachers' role and how that might be changing in South Africa and again this larger question on implementation and some of these challenges and opportunities that --

MR. MWELI: Well, one thing for sure, with all our challenges in the country, South Africa is a country of immense opportunities and -- but I want to cast my eyes beyond South Africa. One it's that at least within the continent, there is convergence and we have what we call the continental education strategy of Africa at 2020 towards 2025 which is linked to the education agenda, 2030 driven by UNESCO.

In South Africa, we at least have, for the first time, what is called the national development plan which affords us long term planning and even though you have administrations coming and going, at least there is a plan driving the vision of the country towards 2030. That gives us some semblance of hope and because of that, and the plan is quite clear on what needs to be done. Foundational skills of numeracy and literacy, it's quite explicit and very detailed on what needs to be done and we started following that plan and given the fact that we've got continental obligations and we have no choice but to make sure that whatever we do also delivers on continental obligations, I mean the sustainable goal forward -- also it's quite clear on what we need to do and because of all those, we came up with what we call the three stream model.

The three stream model is about focusing and placing and emphasis on making sure that we get more and more young people doing math, science and technology subjects or STEM subjects and of course, there is another forecast for arts and culture in terms of focus schools but we are of the view

that part of what is called skills of the 21st century is around math and science and before 2008, a large number of young people, particularly at secondary school were not exposed to doing mathematics but since 2008, all young people are expected to do some kind of mathematics.

There are three types of mathematics in South Africa, you've got core mathematics, you've got technical mathematics and mathematical literacy. Mathematical literacy is mathematics for social use. In other words, every citizen is expected to have skills and knowledge of that kind of mathematics for successful living and we also have the opportunity in terms of other developments. I've referred to the notion of fees must fall in South Africa.

Linked to that, the young people have been quite vocal about decolonizing the education system and we have accepted that for a long time, we've been implementing an education system that has explicit features of a colonial education system which was essentially preparing young people to look for jobs and we've now changed the forecast to say the Fed stream that we are bringing in is now going to focus on getting skills for young people to create jobs.

We've developed a curriculum based on 26 subjects which brings early, as early as grade six, your artisan skills and other skills that they would require for entry level in the labor market.

We are of the view that the economy in terms of creating employment might be a bit saturated. I am awfully aware that for the two to three days that I've been here we've also been downgraded which would add to our woes and therefore the notion of making sure that young people are empowered to create jobs and to have portable skills and -- but also to make sure that those skills will afford them to succeed, not only in South Africa, beyond borders of South Africa, the continent and the world.

MS. CHUNG: Great, thank you so much. So I am going to ask one more set of questions to the panelists and we are going to open it up to floor just so the audience is ready with your questions. As kind of a last question for the panel, what kinds of reflections or thoughts or questions came up for you as you read the report which actually is a wonderful way to kind of take you out of your own particular country's context and at least see the challenges and opportunities in other countries and I wonder if you can kind of talk very briefly about what keeps you up at night, what's an unsolvable problem as you are tackling this large question around how do I help my education system prepare our young

people for not only success in their own lives but as we heard, in down the line, success for the country as a whole so what's a remaining question for you and what's an important -- (inaudible) that you say from just reading the report?

MR. OGUTU: What I think about at night is how do I crystalize it for each of the stakeholders to realize that we are in it together. It's not just government, it's not the policymakers but the teacher, the parent, the child, the private sector, the business owner, that we are in this together and we owe it to each other to work together because each of us has their own strength but when you keep it to yourself, your own strength, yes, you're strong but only in your area yet your strength can help build this community and there is this saying, we normally talk about nothing for us without us so it's an all-inclusive reform agenda. The teachers are onboard, the parents are onboard. We even have the children onboard through what we call the children government.

We've got the children onboard telling us what they want school to be like. What they would want learning to be like but then how do we communicate that we've heard you loud and clear and what we are coming up with is good for you and for this country.

And Hubert talked about the colonizing education. I think more of what professor (inaudible) says about decolonizing the mind so that people think we are a need for the good of the community. It's not just because I am on the government side but I am also a parent and I would like to see my child learn. I am a stakeholder, I am a businessman, I am in industry and I want somebody coming through the system who is well-oiled and ready to work.

I would want to support start-up businesses, people who come up of institutions ready to begin business, ready to create employment for others or even who do that while in school and we have this great idea about entrepreneurship, how we can create entrepreneurs even while they are in school. They come up with business ideas which then are nurtured and go through kind of an incubation system and they can be implemented and great -- I look ahead and see great things for Africa and also great things for Kenya. I am really optimistic, maybe because I am an optimist? I don't know.

MS. CHUNG: Great, thank you.

MR. HERNANDEZ: Thank you, Connie. Let me start with something that I want to say about my last answer. My optimism, following Darius, comes from -- I was one of the persons in charge

of changing social policy in Mexico two years before the change of the government and that program has remained over four different governments with changes of parties in the country so I have experience that that can happen so that said, let me tell you that I like the report because it's very down to earth.

We started a reform in high and middle education in Mexico in 2008 based on the competencies model. We thought that we knew everything and once we read the report and we had the meetings with Emily and so on, we discovered that there has been a lot of learning about the skills process over the last 10 years in the world and that things are very similar to the promise that we have faced over the last 10 years in our system.

Skills probation, that is one of the things that is more important and that we hear from the teachers every day. Not the evaluation of skills in a yearly exam or a three year exam or whatever but how teachers track that test that we are asking them to perform in the classroom that is very far from what they have learned in teachers' colleges or in universities so this is one of the things that I like the most about the paper.

The second thing is that different stakeholders have different ideas about skills so in that we, as middle managers, we need to understand that the information that we need to transmit to all of the stakeholders has to address the things that they are looking at and how they look at these things that are skills that are not only our concern but it's also their concern for the lives of their children.

The third thing is that skills can be taught but teachers don't have all the tools for that task. One thing is that we need to think how to support them and encourage them to do this work because it's not easy to close the door and be alone in front of 30, 40, 50 kids so these are the three ideas that I like the most about the report and the last one is that you need to be serious about integrating skills into the curriculum. It cannot be something that is done by degree. It's something that needs a lot of work.

Fortunately. We have been doing that over the last 12 months in Mexico. I hope we did good work but obviously, this is a living process and we need to be clear that we will need to be ready to make the adjustments that need to be made once we start rolling out the whole process.

MS. CHUNG: Mathanzima has always been the last person to speak so I am going to skip over Therese for now and have him speak and then go back, if that's okay.

MR. MWELI: Thank you. I think what's quite interesting for me is the notion of providing young people with the skills to become successful persons and I hope we are not defining success in terms of skills for affording them to look for jobs. I've already said, in my own country, I believe that the labor market is a bit saturated. What we need to do is create more capacity and we'll be able to create more jobs and that's what keeps me awake at night.

The young people who are unemployed -- and by the way, out of the 27 percent, if my memory serves me well, 9 percent of those young people have university degrees but they can't get employment.

University education is also not a guarantee to getting employment. It depends on what you study on and it depends on the traction of the labor market as well and that's why I am of a very strong view that we need to go quite aggressive in equipping young people to be able to create more jobs but I think the world has increasingly become an exciting place in the midst of rumors of war and so on.

I think initiatives of this nature help to refresh our thinking, sharpen our thinking as policymakers and also implement us but also reminding that -- I was saying to one colleague that increasingly, borders across countries are also becoming a bit obsolete because when I was growing up as a young person, my ambition was to go and work in cities with tall buildings and so on. I've achieved that dream. But the dream of my three children, and the children of many of us is to find themselves somewhere. When they wake up one day, they'll wake up in the middle of the street in Moscow or the street in Germany or somewhere in Africa, in Accra, Ghana. Even Kenya, Nairobi so we have to equip them with those skills, portable skills that will afford them this mobility and still succeed in life and become human beings that are very significant in life to contribute to the development of the globe, thank you.

MS. CHUNG: Thank you so much. Therese, you have the last word.

MS. BUSTOS: So all this talk about skills for the changing world -- it's actually very future focused, and what keeps me awake at night is the present and how do we get -- take a look at the resources, take a look at what we have to get to that future so having read the report, looking at the different country reports, one was a good thing so at least my country is not alone in this fight to achieve one's goals, educational goals, however, it also gave me an appreciation of what was being done, as I said. Teacher training is an issue, however, the country has been trying its best to improve the in service

training that we have been giving faculty teachers and so a lot of effort has been placed there so we've thought of different paradigms on how to be able to cascade training more efficiently, given the size of the bureaucracy and so there are -- I can see positive things going on in the department of education, however, there are still things also that we need to pay attention to, things that we don't really have answers for, however, I guess because of this exercise of listening to each other and being able to express all these concerns about that future, I guess I am in a better position now to really think clearly about things that are going on in my country.

MS. CHUNG: Thank you so much. We'd like to open it up to the audience for any questions that you might have based on what you heard. Change is not just a cognitive process but also social and emotional and I think you've heard that theme throughout and of course, these folks who were all on stage with us are not just talking, just concerned about the success of an individual child but their whole country so I think you raise some interesting thoughts so I wonder if we could get like three or four questions at a time and address them in groups of three or four.

So there's a hand here, I see a hand here and a hand there. Go ahead.

QUESTIONER: Hi everyone, thank you so much. That was an engaging and interesting discussion. My name is Nalini Chugani, I am with Education Development Center so I am coming from the implementer side of it so this is all very very relevant and if I may, I have two questions. The first is a little bit about young children. I want to ask about your experiences integrating soft skills into your younger children, cohorts, and what ages your countries are starting to do that with and what experiences you are having around that.

My second question is around research and assessment and really starting to think about assessment of soft skills and it's really important that you have the teachers, the students, the community, everyone really on board, understanding the value of these skills. So in your important positions and where you all sit in your countries, I want to know what you need from us. What you need from implementers, what kind of research, what kind of information do you need in light of conversations this morning, there is so much research out there but what do you need to really influence the policymakers, make the teachers understand what you need, make the students themselves understand the importance of this.

MS. CHUNG: Thank you.

QUESTIONER: Thank you very much. It's been an amazing whole day and yesterday of -- my head is way to full. My question has to do with teacher education. Everybody's talked about it. My name is Annie Kidder, I am from Ontario, Canada. I run an organization that does research and advocacy around public education and I think no matter where we are in the world, we are all thinking about kind of the same things so you all talked about new ways of thinking about teacher education, interactive pedagogy that we can't -- if we are going to teach teachers to teach in a different way, we have to teach them differently so how would we do it, what would look different if you were going to redesign it completely, what would that new teacher education look like?

MS. CHUNG: Great.

QUESTIONER: Hi, I am Emily Gustaffson-Wright, one of the co-authors on the report. Thank you for a great panel and all of our country representatives. So my question is to Daniel. So you mentioned how the progressive program has survived over multiple administrations so besides the fact that it's changed names from Progesa to Oportunidades to Prospera, which I actually don't think is minor, what other lessons can you draw from that to apply to the new education model and the kinds of questions that we are talking about today?

MS. CHUNG: Is there one more hand that I saw right there? One more and we'll answer these and take another few.

QUESTIONER: I am Hazha Zayib from the (inaudible) thanks a lot for the presentations. It seems that each country that has been presented today and maybe many others have -- you know, they are working within their own framework, within which they provide a set of skills to their young learners and I wonder if we should take a pause as an international community, take a pause and see whether there is a need to reduce the fragmentation of various frameworks and come together and develop one framework of competencies that need to be nurtured at different ages, at different grade levels and it may require consultation with psychologists, with anthropologists, private sector but it may streamline many of the things that we have been talking about which is about how do we assess skills, how do we train teachers so just a thought.

MS. CHUNG: Thank you. So just quickly summarize the questions that have come up.

There is a question around what does this mean for very young people and what changes do we need to do from early childhood on.

A question about what do you need from implementers in order to change not just mechanisms but mindsets so that more people, more stakeholders value this broadening of skills, especially soft skills. A question around if you really were to change teacher education so that it would actually produce teachers who might be able to do this, what would teacher education look like and then a question to Daniel specifically around -- based on your own experiences of having run some of these programs, what are some of the lessons that might carry over, transfer, as you do this next phase of educational reform.

And then this question around, as much as it seems like context matters, as you decide what to prioritize in your country so from Kenya to South Africa, is there room for coming up with one singular framework that all of us can get behind so that we can share knowledge and streamline some of the changes that need to happen very very quickly in a world that's also changing very quickly.

MR. HERNANDEZ: Let me start. I'll be fast.

MS. CHUNG: Please.

MR. HERNANDEZ: What we have learned from a continuous teacher formation -- somebody said to Susan, I guess, is 15 hours is better than 30. I agree with that. Shorter courses that provide teachers with real world experience.

We are using a lot of videos coming out from classrooms. Teachers don't believe that these are actual classroom videos. They say why do you have actors? These are not actors, these are not -- the best teachers that we have and we want you to see what we are doing -- what they are doing and this is something that has been very successful among teachers, lessons learned.

Implement. Implement as fast as you can -- certain task that you promise to achieve in a short span of time to document everything that you do, maybe evaluations will take a little longer. We have the opportunity to do very fine evaluations that are the mark of the social policy in the world but it documents everything you do so that people can see what you have done, be transparent, do things the right way, basically these three things are what has support, a program that started very close to the (inaudible) government to continue over the years.

MR. MWELI: Well the issue of -- thank you very much for the questions and comments. The issues of reducing fragmentation of frameworks. I think we almost -- I've already indicated that globally you've got a sustainable goal four which is, in my view, very clear on what member countries are expected to do and at the continental level, the framework has been even consolidated there and then from the continent, at country level you've got programs that are responding to the framework.

I have never seen such a level of synchronization in my whole life and career for education at least. From that point of view, that's why I am saying we are in a better position, we are in a better space as the global village to do even better. I mean you would have heard from yesterday, this morning, up to now, if you listen to individual countries talking about core skills, they are essentially very generic and common to many of us.

Maybe what we might need to do is to pay some attention to the curriculum and I think Prof said it this morning. I think South Africa has the same challenge. Our curriculum is too wide and we paid very little attention to depth and we are attending to that. That's the recommendation that I would make but in terms of frameworks, I think we almost -- there is modern enough convergence. Teacher education, it's a million dollar question. It's a very difficult one. What we started doing in South Africa, there are two entry points. As the colleague from Kenya indicated, that the teachers that we have at least for now, we have to do the best that we can because that's all that we have, until we get those that are better than the ones that we have.

Our teacher development programs have also not been in keeping with the skills that we are talking about. I am talking about ongoing teacher development programs, programs that are intending to refresh teachers who are in the field already so we need to sharpen our ongoing teacher development programs and my old nomenclature, they used to be called in service training of teachers to make sure that those who were in charge of that get this message as well and then the second part of it is the initial teacher education.

We've started some discussion because in South Africa we have moved from training teachers through teacher training colleges. We are now training through universities. The research has indicated that new entrants into the profession are very strong on subject content knowledge but very weak on pedagogy and we think we know why, because universities are quite strong on knowledge

creation and so on but historically, at least in South Africa they've not really been strong on teaching methodology so that's how we are tackling that challenge from those two points. Well the younger children's education is the last point but early childhood development, working with UNICEF and other partners, we've started to implement a National Curriculum framework for early childhood development from -- we are calling it from 0 to 4 years old in South Africa.

We believe that children learn even when they are still carried, before they are delivered. We call it pre-birth and we've developed a framework stimulation program for mothers who are pregnant and beyond that, we now have a framework for those who go through our early childhood development centers and we believe that it's a strategy that is really going to turn around the situation and make sure that when these young people start schooling, they will be school ready. They will have the basic skills so that they start learning more of the skills that will be introduced to and from (inaudible).

MS. CHUNG: And there are also some studies that show that these are not two separate skills, soft skills versus hard skills. Darius?

MR. OGUTU: Just to add on to what Hubert was saying. Until I attended a DOHAD meeting, Developmental Origins of Health and Disease, that I came to terms with tons of research evidence on the first 1,000 days of a child and how that impacts on the child's development. In his whole life. The first 1,000 days when this individual gets into these walls, what happens to that child almost impacts the whole life of this child and we are now looking at it not as a ministry of education issued for early childhood but we are partnering with ministerial health and saying when the parents bring the children to the clinic, can they be trained on early stimulation? Can they be given some ideas on what they can do with the child so that even before the child gets into the system, they are already encountering some subtle things that will enable them to open up to learning because those first 1,000 days, they are not in the education system, they are out there with their mothers and their caregivers so what is it that they can give us and mothers can do so that when the child gets in the system, they are already ready to learn. They've already embraced aspects that we'll encourage them to go through the system and we are making it very clear to the teachers at the early childhood level that it's not about teaching this child already to speak a new language or to count at that early age. It's about transitioning from home to a school environment.

From home to where they are meeting some other children and learning how to work together and normally we talk about the fact that I can speak English doesn't mean that I am intelligent. It's just a language that I've learned and the intelligence in how I do other aspects, not just the language so this -- in Kenya we have parents who are obsessed with their children learning how to speak English so that when your child knows how to speak English, then you are happy but at that time, it doesn't mean the child is intelligent. They just learned how to speak a language. There are more milestones that they need to achieve and yes, we are integrating those soft skills and realizing that it is not only ministerial education, the ministry of health has a role to play the parents, the caregivers and all those that interact with this child before they get into the system and by the time they are in the system, we are struggling to make sure there is readiness for learning by the time the child gets into grade one.

On the issue of what we need, I wish we would package all this evidence into what works in certain situations so that if I am in Cape Town, South Africa or Soweto, there is an adapted tool that will work in Cape Town, South Africa. If I am in Nairobi, Kenya, there is something that I can adapt to my situation and yes, we are working on regional and continental frameworks so that we are talking from the point of knowledge where we understand each other.

I can't say who but I can say -- on this aspect, this is how well we are doing, why, because we are able to measure that. We are able to determine the progress that we are making in our various areas then on teacher education, very important, I was trained as a teacher to get all the knowledge I can and impart it on the learners.

I was not trained to allow the learners to learn. To create a condition where they will learn on their own so the teacher possesses all of the knowledge and all the child has to do is show up and download what I am going to present but that is not how the world works and it's changing of mindsets and now we are thinking of how is it possible that Connie can be in a school that neighbors me and does very well but I am the next door neighbor and I am not doing so well and I cannot walk across and ask Connie how come you are doing so well? What is it that you are giving your students that I am not giving my students so issues of creating communities of practice among the practicing teachers so that they can not only share resources but they can share knowledge, they can share expertise. They can share pedagogical approaches that work because the main issue here is what works in your situation

and I am normally impress by my 11 year old and 12 year old boys. They get a hold of my device, whether it's a phone or a tablet and they don't need a manual to go through that device.

They'll work through the system and I'll find they've changed the settings and I am complaining. Who changed these and they said "Dad, don't worry." They touch a few things and it's back to how it was. They are learning not by looking at the manual but by interacting with that technology and experimenting, taking risks.

So for me, that is how we need to excite the teacher that these learners are full of potential. You only need to give them an opportunity.

MS. BUSTOS: Okay, so talking about frameworks, can there be one common framework? I think we can agree on a common framework in broad strokes, broad terms, however the framework has to take into consideration our differences culturally, social and it has to give us leeway to be able to express.

For example, in terms of communication, there are ways of communicating in my country that will not work in yours and similarly, ways that you have that if you go to my country, you'll face a blank wall and so when we think about communication skills, et cetera, and all of these 21st century skills, we need to look at them within a context so can we have one common framework? Probably, but again, in very general terms.

The specifics, we would have to leave the individual countries and how to best flesh them out. Someone asked a question about teacher education and when we did the study for that map and teachers were saying they needed mentors. Mentors who would show them what it really was to be using transversal competencies to be having them and so that was a big question. Now where do I find mentors for them? Even in my own university, who -- not just in the college of education, in other colleges in higher education.

Who among our professors are actually using all of these skills and not just lecturing, which has been the most convenient way of sharing information, well at least of doing your job.

So I guess -- and that's the challenge really. So how do you find now exemplars of the skills that we want our children to learn and that's what you've said. When you find that exemplar, you might as well take videos of that person and disseminate to everybody because right now it is a challenge

in my country, where do I find mentors for them? Even within the college of education. It's -- it makes more, this task quite lofty.

Now what can you do to help? Many times, we do have a lot of research organizations giving proposals and doing a lot of research. When research is seen as a project, as an individual project and when we don't look at it in terms of a broader goal, then you can really end up having piles of research in one's office and so in my country, there has been a time when yes, people have been engaging in research but no one was really putting all of them together so -- just so we are able to make sense of all of them so if there are external organizations that would like to help, I think the help that can be done would be in that area, instead of establishing yourself as an organization doing good in a country, take note of what has already been done and try to make use of what has been done and help the country synthesize and help the country make good news of the research that has been made available.

Now for young children, teachers say it's easier to integrate the soft skills in preschool. We have imbedded soft skills within the curriculum however, again, when you have teachers who feel that whatever is in the curriculum is more subject matter oriented and they just see all of these as activities to get the job done, then that becomes quite problematic and so I think, again, yes, we do have a curriculum for it. We do have soft skills, but our teachers would need to be able to see good examples of how those are actually practices, even among young children and so again, I guess my last word would be that a lot of the things that we have been talking about are not just teacher education problems. They are actually problems of higher education too so we are talking about basic and how do we produce all of these young learners with all of these skills but what we are seeing now in basic ed would be a reflection too of what's going on in higher ed and so I think reform is also due at that level just so it trickles down also to basic education.

MS. CHUNG: Great, that's wonderful. Maybe one or two questions more. Right there and --

QUESTIONER: Thank you. I am Hezba Natirna from Kenya. In Kenya, when you do driving, you get a driving license and then you are told as you go driving, consider yourself as the only sane driver on the road so that you can think out of the box.

How do we help the teachers to think out of the box, rather than being -- working under prescription? It's like the curriculum is so prescriptive so that you stick to a certain form of work.

Two, as you are going through the introductory remarks, we saw how the partners in education are closer to the child and we have the parent and we have the government. In Kenya and it might be that this is one of the reasons why teaching is not the first choice. I'm a teacher by profession but my entry into teaching is much more the South African way than the Kenyan way because to him it was like -- it was something that was developed in him through -- and a good example of a teacher but to him it's like it was a second choice and then he perfected on it so you find that in the Kenyan scenario, most of the people who enter are on second choice and then I am happy to say then you work on the second choice to produce the best.

How do we change that perspective to have an entry point to whereby we say somebody who graduates out of school says a man makes the major choices of career, then teaching becomes among the first of the choices and I am bringing in the parent and the government in two ways. The Kenyan scenario again whereby the success of a teacher is much more measured on the summative examination results whereby you'll be a successful teacher if you produce very many (inaudible) as compared to somebody who has not produced them and whereby ranking comes and I saw there was some display of some ranking somewhere here and it was written for the first five children.

That ranking of schools, ranking of children and then when our minister of education releases the results, it says that the top schools at this -- the top candidates at this -- based on thematic examination and so it means that those teachers who are teaching in schools which have not been ranked highly, they are also considered failures so now how do we remove that notion from the parent, from the government so that we look at the other skills that can make a teacher look successful rather than the summative results in an examination so that -- it can also change the pedagogical approach in terms of the teacher thinking out of the box and it can also change the approach of the teacher training in a teacher college so that the teacher can be developed to be an all around teacher.

MS. CHUNG: So in the two minutes that are left, I am just going to throw it out to whoever wants to respond to this question. It's an important question all around. You can change curriculum all you want but if the way in which you are evaluating the success of a teacher or a school

system by a fixed measure, that's highly dependent on a particular way of doing it then how do you create the value creators that many of you talked about, how do you create students who can be creative, create value for themselves, create value for themselves and society and be able to function and overall work that kind of adaptability and flexibility if they think it's highly prized so who would like to speak in 30 seconds or less?

MR. HERNANDEZ: In our country, we did a large reform for teachers and the way that we evaluate teachers doesn't have to do with the results of the students basically because we know that 50 percent of what happens comes from the socioeconomic environment of them.

We tried to balance how they planned their classes, how they achieve -- they have rubrics of how their students are learning. Obviously we examine their disciplinary knowledge. You need to know some mathematics if you are going to be a math teacher. This is a process that is ongoing but at least in the first two years, teachers have -- well we accepted the process and we are fine-tuning it and we hope in the next three to four years, we are going to, with their collaboration and with their participation come with better instruments that really reflect their everyday work which is basically what we need to address.

MR. MWELL: And just to respond to that, I think (inaudible). We scrapped the issue of ranking and the lawmakers actually went back to parliament to make a law to force us to go back into ranking but also, on the issue of what we can do for teachers, for me it boils down to two things.

It is trust and accountability. We have to trust that teacher whom we have, whom we've given our children to. We have to trust that teacher. We as parents, we have to trust that teacher that they are going to produce the results that we expect but yet again, the teacher has to trust himself or herself that they are capable of handling that responsibility and they must be accountable not only to the children, not only to the government and the community but to themselves because they normally say this, you can never pay a teacher enough for what they do in terms of salary.

You impact on generations. You impact and nurture and create so many people, you can never be paid enough so the motivation is not in how much I get but in the joy and beauty of seeing children go through your hands and acquire certain confidences so for me, we are reforming all these things but the trust we place on the teacher and the accountability that the teacher takes up in terms of

their responsibility. You know, as a teacher, you are a co-creator. You are almost like god, you are a cocreator, you are creating humanity in that classroom.

Once they come to the realization that they are co-creators and they are working together with whoever else, then it will be a huge thinking change and a huge paradigm shift to thinking outside the box. Thank you.

MS. CHUNG: Thank you. I think that's a lovely not to end on, this notion of teachers as being co-creators of children and communities and countries and hopefully the next panel will continue that discussion. Thank you very much and enjoy the break for 15 minutes. (Applause)

(Recess)

MS. KWAUK: Good afternoon everyone. Everybody please take your seats. Thank you so much. You've made it through the day -- it's the last panel. Many of you are probably wondering why do I have bricks on my chair, so we'll get to that really soon. If you guys can make your way to your seats.

So my name is Christina Kwauk. I'm a post-doctoral fellow here at Brookings and I will be your moderator for this panel. We spent most of the day today looking at this breadth of skills movement, at the global level, at the regional level, at the country level, and now we're going to take the conversation down a little bit further and take a closer look at practices on the ground and in the classroom. We're going to try to answer some questions like what kinds of activities can you undertake in the classroom to develop and get at this breadth of skills, how will the education system need to be retooled in order to gear itself towards those skills, and as we've been talking about over and over today, what are those implications for teachers and how do we better support teachers to teach these kinds of skills.

So the layout for today, we're going to begin with a brief activity with those toys that you have in your lap now. And then we're going to go -- we're going to do a series of Q&A between the audience and then coming back up to our panelists. So we'll do two rounds of questions and answers, so you'll have plenty of time to sort of engage with our panelists and also the panelists will engage with themselves.

Welcome again to all of you now who are now in your seats. And to those who are tuned

into our live webcast, hello, you made it. For those of you in the audience as well as watching us on line, you can follow the conversation on Twitter using our hashtag #BreadthofSkills.

So now I'm going to really quickly introduce our panelists. I'll ask them each to come on stage and stand in front of their chairs as I introduce them. So first we have Christopher Kyakukaisha Yalukanda -- if you would come on up -- who is the director of research and information at Zambia National Union of Teachers. He's also the chairperson of the Teaching Council of Zambia and executive board member of the African Federation of Teaching Regulatory Authority.

Next we have Sean Slade, who is the senior director of global outreach at the Association for Supervision and Curriculum Development. He is also the vice president of advocacy for the International Union of Health Promotion and Education in the Northern American Region.

And then, finally, Brent Hutcheson, the director of Hands on Technologies and the Care for Education NPO. Brent is also an Ashoka fellow and a teacher.

And you all have their long extended bios in your agenda. So if you're interested please do take a look a little bit more at what they have.

So without further ado we're going to lead our activity with Brent.

MR. HUTCHESON: Thank you. Good afternoon everybody. I've been asked to share very briefly some activities that we are trying in the classrooms in South Africa and I'll stop you at times and perhaps link it back to the breadth of skills. But I'm hoping that in experimenting and in just doing some of the activities you'll see the links yourselves and you won't have to have it explained to you. But it's going to be a very active session, which is going to be something different to that which we've experienced up until now. And when I say different it means that I'm going to get you to actually physically stand up and you're not going to be able to hold a cell phone or a laptop while you're doing this. Those of you that have been typing the whole day, your fingers are going to be involved in different activities right now. And it's going to create quite a lot of noise and quite a lot of chaos, which means that you're going to see me from time to time jumping up and down on the stage trying to get your attention. That means that the activity stopped and I'm about to start the next one. That's why I have these panelists with me, to help me control you.

So what I'd like you to do is I'd like you to take your two bricks, stand up, drop your cell

phones, drop everything else, your tea, coffee, anything else that you have. Get some space, find some space. If you need to move into the aisle or to the back of the room, to the front of the room, wherever you're comfortable. Make sure you cannot touch anybody else, otherwise you could hurt them.

(Laughter) You think I'm joking.

So there was a fantastic question earlier, how do you start this with very young children. Hopefully I'm going to show you how we start this. The manipulatives that you have in your hands today could be replaced with very many different manipulatives in the world. I just happen to work with the Lego manipulative in South Africa and it's the one that I really know, so I'm using it with you today, but you could replace this with any manipulative. Right now you just have two objects, one in each hand. I hope you've got that. What I'd like you to do is put those objects in your arm and extend your arms as wide as you can, remember not touching anybody. And I'd like you to close your eyes. Close your eyes. Most of you have been doing this most of the morning. (Laughter) Okay. What I'd like you to do is move those bricks in your hands, start turning them, start twisting those bricks in your hands. Do you feel any smooth areas, any areas where there are sharp corners, any areas that are raised or bumps, any areas where there are holes or depressions. Fantastic. Open your eyes. So you've just answered some really important questions around tactile tools or objects that children can manipulate. And what we're trying to do is get children to manipulate and use objects to build their understanding, their concrete understanding of these very concepts that we've been talking about the whole day. And through some very simple exercises I can take you through an experience of some of these concepts.

So think about all of these concepts and think about the very simple ideas that you're just going to try now, and how essential these could be. So the first thing I'd like you to do is just stand with your hands like this. When you have your hands like this outside of your body, just in the normal relaxed position, you're at a very critical let's say range. It's called the range of vision. It means that right now your body has these two objects outside of your range of vision. Meaning your eyes have to move across the midline to be able to track these objects if it's going from one object to the other. So what I'm going to get you to do is a very simple exercise. Just throw up with one hand, throw up with the other hand, one at a time. Very simple. Every child can do this. Okay, and stop. So very basic exercise, very simple exercise, and it's starting to get the eyes to start working and doing some very important exercises that

we need kids to do.

Right now what we've done is perhaps just crossing the midline with the eyes and getting the eyes to move across our body. What has started to showcase itself in terms of the exercises that we're doing is that when we get children to move and work with objects from here, here around the body, so the spatial awareness outside of the range of vision. We are finding incredibly different development taking place when we get children active here. And I'm going to show you perhaps why some of those things are happening. So what I'd like you to do now is we were just getting your eyes to move, now I'm going to ask you to do something a little bit more difficult. I'm going to ask you to get the objects to move across the midline and getting your brain to start doing some type of bilateral integration. Not too difficult, but just simply throwing the bricks across like this. Okay, fantastic. So we definitely noticed that more bricks were on the floor now than they were in the hands.

And what I wanted to show you in terms of cognitive development, and something which is really interesting, is I want you as quickly as you can now, you've got the bricks in your hands, you've just been doing it like this, do in a reverse order. On your marks, get set, go, go. Reverse order. Okay and stop. So did you notice that when I asked you to do it in the reverse order there was quite a lot of processing that had to happen? You actually had to think about it, you actually had to say to yourself wait a minute, I'm so used to perhaps doing it in one way, muscle memory, just the way I've been doing it if I've ever juggled a ball before. Now all of the sudden to change that I've had to really stop and think through the process. The end result didn't change, did it? But I had to think about the process. It looks likely different, but it was exactly the same, objects were crossing the midline. Like I said, we were thinking about the process and challenging ourselves to see whether we can change the process, which is quite an important exercise.

What I'd like you to do now, just for a little bit of fun is I want you to find a partner, somebody in the room. It can be a group of people, it doesn't matter. So perhaps I'm working with you for now I guess. So I have a partner. So what I want you to do is the following, I want you to tell your partner two places where you'd like to balance your bricks on your body and you must verbally tell them so they can hear it verbally and they can copy you. Once they've done it then you have a chance to do it. So, for instance, I'm going to say I'd like you to take your brick and balance it on your right foot like this.

And then on your left shoulder. You can give me a chance. Fantastic. Okay. On top of your left hand and underneath your left hand. Here you go, high five here. And then right foot. Getting difficult again, hey? Okay, if we can stop.

Okay, let's carry on with the next exercise. So the relevance of that exercise, very quickly, position in space, spatial awareness, critical. A lot of studies will point to that perhaps your spatial ability at age four is one of your best predictors of mass ability at age eight. So understanding spatial awareness, the space around you, really important in that exercise. So we're using space. But also really importantly, in countries where perhaps children are learning in a language that isn't their first language, think of the use of prepositions -- on top, underneath, around, so all of a sudden a building of these concepts. Those are critical in terms of developing these skills that we're wanting to develop.

The next exercise that I'd like you to do is to take your bricks and put them together. Okay, great. Well done. (Laughter) That's good to see somebody at the back putting their hands up like, finally. Okay, so what I'd like you to do is a very simple science experiment for me. I'd like you to take these bricks and throw it up and then catch them. A science experiment you may ask, why is this a science experiment. Well, there's a lot going on while you're throwing those bricks up. I mean all of you are testing acceleration, momentum, velocity. You're all doing a lot of that right now. What I'd like you to do now is extend that science experiment by doing the following, I want you to work out how many times you could potentially clap while that brick is in the air. So, one-two-three -- how many? Okay, and stop. Question, how many of you improved from the beginning to the end? So whose numbers went up? How many of you increased the numbers as you went up? Fantastic. So more than half the room went up, meaning that the first time you may have said let's see, one-two-three-four -- oh, I can do more than that. There's a bit more room, let' see if I can get it higher. But from a developmental perspective, and an experimental perspective, perhaps that wasn't the best way of doing it. Perhaps there was a better way to do this experiment, which is something that children might try, or at least we should give them the chance to do, which is the following (demonstration by Mr. Hutcheson). Allowing the brick to fall past our hands and working out how many times, allowing the mistake or the so called failure to allow us to achieve something higher. So we need to give children activities that allow them to experiment and to at times make mistakes in order to achieve the next part, which answers many of the skills. So that was a

really important exercise as well.

Okay. For you guys, just to push you because you're not children, let's give you something a bit more exciting. I don't know if I can do it here. I think I can. All right. So, this is the one that I said could hurt people. Are you ready? (Laughter) So all of you, I was watching you while I asked you to just throw it up a few times, there was nobody in the room -- oh, these lights are not easy -- there was nobody in the room who was struggling with just throwing it up and catching it, but are you able to throw it up like that and just catch it behind your back? Let's see you do that. Okay, we can stop. I noticed that there were quite a few people in the room that were able to do it. But the exercise is just to show you -- I want to demonstrate one thing to you, and this is where again this is an exercise where children can make mistakes or fail again and again and again, and they'll be driven by the potential of maybe catching it and what it feels like to catch it and that sense of achievement. And that would build this positive feeling, self belief. And the more often I give them the chance to practice it, they might try different things, like throw it higher or do different things. But what's really important in this exercise is perhaps the mindset of the person. So most of you were able to throw the brick up and catch it like I told you. Most of you were able to do that. But when I asked you to do this exercise you changed what you knew. You knew how long it takes to go up and down, so you've been practicing that while you've been with me the whole day, how long it takes a set of bricks, based on their weight, to go up and come down. What do I have to do if I want to catch them behind my head is don't change the throw, change your body. So throw, move your body, put your hands where it's coming and you'll catch it. But most of you changed that science experiment --

SPEAKER: (Inaudible).

MR. HUTCHESON: I won't go over. (Laughter) Most of you changed the experiment by doing the following, so if I look at you sideways, instead of doing that most of you thought, wait, as adults I can think this through -- I'll do this (laughter) and try and catch it. So do you see what happens in terms of the processing? So just by doing these very simple exercises we can start teaching children about the process and start working with this process. And that process, and working with manipulatives, I hope by now you can feel that in your hands is a tingling sensation. I can also promise you that when you sit down to listen to the rest of us talk now, you're going to be much more engaged.

Thank you. (Applause)

MS. KWAKU: All right. Thank you so much, Brent. So to the audience now what kind of questions -- I'm sure that series of activities have really inspired some thought and some thinking around the actual kinds of activities that you can bring into the classroom. We'd like to take a couple of minutes to gather a couple of questions for Brent in particular and then we'll move into our more conversational part of the session.

No question? All right, there we go, we've got one in the back and then one right there.

QUESTIONER: What do the lawyers think about all this? (Laughter)

QUESTIONER: My name is (inaudible) from Nigeria. (Technical difficulties with microphone). So I was saying first an idea is almost like a repository where we can have lots of these kind of activities that teachers can dip into. But the second side is how does a teacher go about embedding these in strictly subject based classroom setting? How do I -- I mean there are lots of ideas that cross lots of subject, how do you embed what is for this subject? And maybe it means we need to change the way the classes are structured.

MS. KWAKU: One or two more questions?

QUESTIONER: Hi. Jennie Gambell here. How do you incorporate parents into these activities and what kind of discussions or coaching might they need as children age to kind of validate or justify the continued use of manipulatives?

MS. KWAKU: One more question? All right. No. All right. We'll go over to Brent and then we'll get into our others.

MR. HUTCHESON: So some really good questions. First of all, yeah, it's place where we've taken some of these ideas. In South Africa we're using six bricks. So today you were only playing with two. In South Africa we believe that we only need six, four to get you outside the range of vision that I was talking about, six because I need the midline, so I can do crossing the midline, bilateral integration, very simple. It's the least number of tools that you need and it will become let's say a scalable cost effective solution. If you add that to a couple of hundred, which we've got now maybe 500 activities that you can do with 6 bricks. It starts adding a lot of power to a very simple idea. Just to give you an indication, the two bricks that you have today, there are 24 different ways to connect those together. But

by the time I get to 6 bricks there's over 915,000,000 million different ways. So I'm not going to run out of ideas. So there's plenty of ideas. So that was a really good question. And we do have that and it is freely available worldwide on the internet. So, yes, you can go and look for six bricks, just do some browsing.

In terms of engaging the parents, fantastic question. We're not only targeting the schools with this idea or initiative, it's very specifically for the parents as well. And the idea there is that in the same way that we're trying to encourage schools to leave the manipulative on the desk permanently, to challenge the normal classroom environment, to have a manipulative at arm's length for any lesson, no matter what the content area is. We want the same at a dinner table where parents are able to engage with their children at the dinner table through simple games and exercises where different people are running different activities, so it's not just the parents running the activity, but perhaps the child as well. So being able to take this learning from the classroom back home and from the home back to the classroom. So, yes, lots of ideas around that.

MS. KWAUK: Great. So I wonder if maybe I can do a follow up question for you. If you could help us demystify the process a bit, especially just given the high level of engagement that you had with the audience, and sort of the innovativeness and creativity that you brought to the activity. Is there a guiding principle or a guiding framework for how you go about developing these sorts of activities and how you target specific kinds of skills that you're trying to get with the students?

MR. HUTCHESON: A lot of the ideas are based around the breadth of skills and obviously trying to have a look at how do we -- Susan said earlier, she said you have to manipulate these ideas. Well, you have to start with manipulating objects. If you want to manipulate the ideas you've got to start with manipulating objects. So the important part is to get the children to be manipulating these objects. And how do we get that? How do we get teachers to understand the relevance of that? So, first of all, if I start with two bricks or three bricks with the teacher, it doesn't frighten a teacher. You know, a teacher has picked up a ball and juggled the ball or thrown a ball, or picked up something. So this is not something that teachers haven't done before. So we're not asking them to change anything or to learn new skills. This is something that they already know. All that we're asking them to do is practice those skills. And it goes back to some of the discussions earlier this morning around practice and how many

hours people put in. I don't think on perceptual development we put enough hours into perceptual development. And perceptual development should be -- the children should be guiding us in terms of how much perceptual development they need. And an example, a very simple example of that is if you've ever picked up a child and picked them up by their arms -- and hopefully you don't do it too often -- and you swing them around, or you do the exercise where they crawl up your body and flip over, how many times does a child want to do that? (Laughter) And that should be the guide in terms of how often they need to do something and they have to prove to you that they are capable of doing it. They don't want to do it until they've got it right once or twice. They want to do that a number of times. That's really important in terms of building self belief, self confidence, self esteem. And I don't think in perceptual development we afford children enough, you know, that opportunity enough.

MS. KWAUK: Thank you. So, Chris, I think the conversation definitely needs to go over to your direction, especially with your work with the Teachers Union. So what are those implications for teachers then? What kinds of skills do teachers need to be able to do these sorts of engaging activities, how can education systems better support teachers, not only in terms of materials, in the classroom, with the curriculum, professional development, all of these questions that we've been asking today.

MR. YALUKANDA: Thank you so much for the questions. First, I must indicate that in the past or last two days we've been discussing on how best we can help to develop the skills for changing world, but surprising I haven't seen an ordinary class teacher on the panelists since I came. So I would have preferred that we would have also invited the actual implementers in the classroom to answer some of the challenges which have been raised here, which is very, very important.

This is not only happening here, but it's also usually happening home when government are coming up with new policies. They tend to overlook the teacher who is at the center or the main resource of delivery in their classroom. However, since the teachers' representatives are here, so what I can say is that the teachers are very much concerned in the way the government usually -- the public to say always try to bring the blame on the teacher for the failure of the children in terms of their summative examinations. I recall year after year in my country when the examination results are announced the blame usually -- if the results are not very good the blame goes to the teacher. But we are forgetting that the teacher is just there to facilitate the actual learning in class, but the government also must do their

part. And they're upgrading the knowledge of the teacher, they're preparing the teacher well in their initial training, is the government also providing the necessary tools to help the teacher perform in the classroom.

So there are serious challenges drawing from the (inaudible) we carried out on the learning opportunities in Zambia. You find out that teacher's responses, especially on the teaching and learning aids have revealed that most of the classes they have inadequate teaching and learning aids. And we hope the government will help the teachers not just to provide the teaching and learning aids, but also the training programs must equip the teachers with innovations, creativity to come up with the teaching and learning aids which can assist the teachers to deliver.

In addition to that there are numerous challenges that teachers are experiencing which are hindering their delivery in the classroom. For example, the class sizes. Particularly in Africa, and even in the (inaudible) we did in Zambia, you find that the classroom sizes are too big, 51 and above learners in the classroom. How does the teacher deal with each individual child if they have challenges? I can't really blame the government because there is too much demand for school places for children. So you can't deny a child to enter a school because the classroom is already full, so you have to give each child an opportunity to enter the classroom. The end result is overcrowded classrooms, which translates also into shortages of teachers and learning materials. Even when they policy makers have planned for 45 or 40 learners in the classroom, you have 60 learners. You go to some places in the rural areas where there are 110 students in a classroom, but the planners planned for 45. How do you distribute those resources?

So what I'm saying is that we need not only to blame the teacher, but we also need to do our part. The parents also -- although they have been complaining -- on how they relate with their school. In our research it shows that the teacher's only way of supporting the learners mostly is through giving more homework to do at home, which the parents are really against this. We send the children to school, but we tend to be doing the work of the teacher at home. You have five kids in the home, you send them to school, each one of them comes back home with homework, homework, homework, so you become the teacher as a parent. So it's again this is to blame with the contact type. Our research shows that the contact type, particularly in African schools, or Zambia in particular, is not sufficient. A primary school

pupil in the lower grades may have three hours per day of contact hours, learning time, and this has to be done with maybe 110 pupils in a class. So it's also posing a serious problem. We don't know how we can solve the issue of classroom space because it bothers on finances. Most governments now are not spending the recommended -- UNESCO recommended allocation to education on the national budgets. For example, back home this year we are spending 16 percent of the national budget on education, which literally translates into nothing because there are so many competing demands within the Ministry of Education in Zambia.

Thank you.

MS. KWAIK: Thank you. You raised so many good points about sort of the tensions between the aspirations and the ambition to really move toward the breadth of schools within the realities of resources, scarce resources, overcrowded classrooms that teachers have to deal with on a day to day basis.

So, Sean, maybe I can move over to you then with your work at ASCD. You've really been focused on developing whole child approaches to education. So given kind of what you have described in the past about trying to do a better job with linking together with what we know we want -- what skills children must have as adults with the actual kind of opportunities they get in the classroom, kind of linking those two pieces. What approaches have you seen have actually been moving systems to link those desired skills at adulthood with the opportunities in the classroom?

MR. SLADE: Yes. And thank you for that prelude and invitation.

What we've been doing at ASCD over the last 10 years especially is really focusing on a whole child approach to education. And the thing that we have seen move classrooms and move schools more towards a more holistic approach to education, which incorporates the 21st learning skills as well, is making sure that teachers change their mindset about what they're doing. I'm a big believer, and people who have heard me speak may have heard this as well, I'm a big believer that if you change the mindset about what you're doing, your activities will then change as a consequence. For example, a couple of years ago I was in discussion with one of Arne Duncan's administration after a conference and he asked me if you could change one thing about education in the U.S. what would it be. And I sat back for a while and thought and I said my answer is going to sound a little bit cliché, but I said if we can change the

mindset of teachers to say -- or for them to believe that they're teaching children and youth as opposed to teaching content, I said just that mindset would be a paradigm shift because you automatically worry about the health and wellbeing, the collaboration, the teamwork, the social, emotional development of every child or youth in your classroom if you believe that's your role via these avenues of developing attitudes, skills, and content. So what we have found has been working. And I'm not saying that -- I can't recall who said it before, but someone said there's not going to be one answer today, and there's not. There's going to be a series of answers that we sort of sewed together in a patchwork quilt that will get the answer. But if we can change the mindset of the everyday teacher in the everyday classroom to understand that they're teaching children, that will change things.

One thing that we do, and if we have a couple of minutes we'll do it here with the audience as well if you don't mind.

MS. KWAK: Yes, I think -- yes.

MR. SLADE: And it sort of harks back as well to some of the things that were reported in the report, that one of the things we do is we try and -- we all talk about how we have mission statements at the government level, or even mission statements at the district, or even at the school level, that all sound wonderful. They all say things like creating global citizens who are caring and productive and ready for employment in the future workforce. But then when you go into the classrooms or into the schools you may not see that play out.

So we want to try and get every individual educator believing that they have a mission to play. So what we say is we want you to imagine the child at 25, and that could be your child, it could be someone you teach, it could be you, it could be your neighbor. And we say 25 because it's after all sort of formal schooling. And we can do this now for a couple of -- maybe for a minute. But we say turn around to your neighbor and describe the characteristics or skills or aptitudes or attitudes of that child. So maybe we'll just let people talk for a minute about that. So imagine the child at 25, just turn to your neighbor, describe just four or five adjectives. And this is aspirational, not real. So I had people say to me afterwards, well in debt because of college costs. (Laughter) No, we're not really hoping for that. So this is aspirational, so a straight based approach. So maybe if we spend 30 seconds and let people just chat, and then we'll get a couple of the answers.

(Audience participation in exercise)

Since we have an online audience maybe it's worth us just regrouping as well. So when we ask --

MS. KWAUK: Hello -- let's go back, let's go back.

MR. SLADE: So maybe I can get just a couple of quick called out responses about the adjectives that people said. So what did people say?

AUDIENCE MEMBER: Idealistic.

MR. SLADE: Idealistic.

AUDIENCE MEMBER: Communicative.

MR. SLADE: Communicative.

AUDIENCE MEMBER: Kind.

MR. SLADE: Kind.

AUDIENCE MEMBER: Independent.

MR. SLADE: Independent.

AUDIENCE MEMBER: Empathetic.

MR. SLADE: Empathetic.

AUDIENCE MEMBER: On line.

MR. SLADE: On line. Okay. And every time we do this the same words come up, no matter whether it's teachers in New Jersey, whether it's the superintendents, whether it's one of our conferences, whether it's my local school. They all say those things, which in a way reflect what he had up here before in terms of some of those schools for a 21st century. And I jokingly say nobody says proficient in language arts (laughter), nobody says able to pass eighth grade algebra. Yes, I'm being facetious about that, but we've held those metrics up there as the gold standard and it's changed what education is. So we do this activity to almost give the power back to the teacher to say if that's what you believe the child at 25 ideally should be, then what are you doing in your classroom to make it so. Because we also believe that regardless of -- not to say that we shouldn't change policies -- but regardless of some of the policies that are in there or regardless of some of the environmental input, although a class of 100 is going to be tough -- you've got my sympathy -- what goes on in that classroom

is up to that teacher, and what goes on in that school is up to that principal. So to paraphrase my long winded answer, is we try and change the mindset of the individual teachers to readdress why they got into the profession to start with and why they are still in that profession.

I hope that wasn't too long.

MS. KWAUK: No, not at all, not at all. I think you raised an important point that it's not just blaming teachers, as you pointed out, Christopher, but it's really thinking about the larger mindset shift that needs to happen within the educational aspirations of policy makers and the teachers, even perhaps of parents as well.

Brent, I wonder if you might want to comment a little bit on this because it's ultimately this mind shift away from subjects to process. Thinking about how teachers, even given the pressure to teach to a curriculum or to teach to a test, how that mind set shift, especially in the work that you do, how have you seen this mindset shift actually happening with teachers?

MR. HUTCHESON: For teachers I think one of the most difficult things is to get away from teaching to the end result. It's a really difficult -- you know, from teachers that work with very young children, even for them it's so difficult to break away. And so we have to change their mindset and the best way to do that is to actually use a concrete manipulative. It sounds crazy but you need them to understand that -- a simple example would be if I held up three different colored bricks and I ask you all to copy them. So you put them in the same order that I put them in. Most teachers around the world, once the children put up the answer, most teachers around the world would judge the children and would say right, right, wrong, wrong, wrong. And I tell them that's a complete waste of time. You know, you're not helping anybody by doing that. And in fact judging that in process hasn't helped anybody. In fact most of the class are probably despondent and don't want to learn any further because you've just told them that they're wrong. And what we try and show the teachers through that very practical example is that perhaps it would have been better spending time on the process asking the child what happened inside their head while they were doing it, how did they get to that answer, and show them through that simple example that they can engage with the child and find out from the child what process, their individual process which would be different to everybody else perhaps in the class, but what that child did in that process, and perhaps saying to that child, that was an interesting process, why don't you try this, or could

you have done it a different way, or do you think if we gave you more time you might be able to try something different. So if they spent their time on process you might find that the end result is closer to what you're actually hoping for.

MS. KWAUK: Thank you.

MR. SLADE: And you also -- just a play on that and play back onto your manipulative activity, like everybody, even though we all failed, let's say, in the old term way of failing, of not catching it over our head, we still wanted to keep trying. Our motivation was still there and our engagement was there. So by the way that you had us look at the activity increased our motivation, or at a minimum continued our motivation, but doing it the old fashioned way of saying that's correct, that's incorrect. That child was told that's incorrect their motivation goes down dramatically.

MR. YALUKANDA: Not really, but I just wanted to say that if you want to help the learners acquire these skills, I think it's best that you use the easy and interesting games which allow them to continue to try. So the easy games, from media, from in their society, then sometimes we use these games we have imported from America. We try to bring them to our children. So the local games will be so helpful to the learners because they are within the context of their environment.

MS. KWAUK: So identify kind of relevant examples of games.

MR. YALUKANDA: Yes.

MS. KWAUK: Traditional or indigenous. Yes, great. So I want to take some time to get back to the audience. We'll do a round of questions, maybe four or five questions from you all, and then we're going to back to the panelists.

So I have one right there, one in the back, and then one on the end over here. Josh, I believe.

QUESTIONER: Thank you very much. It's great to see you all up there. I've got two questions that harkens back to the discussions from this morning, and I wanted to give you all the opportunity to comment. One, Darius talked toward the end of his intervention about the importance of giving teachers trust with accountability. And I agree entirely, but I know that there are different views on what that trust looks like. Is it trust to interpret the curriculum, is it trust to deliver the curriculum, is it trust -- so I'd really like your perspectives on that.

And I'm forgetting what the other question I had was (laughter), so I'm going to give more time to the next person.

Thank you.

MS. KWAIK: Thank you. Alex, I believe has --

QUESTIONER: Hi, my name is Zach. I work with WISER International. It's an education group in western Kenya. I had a quick question. We're essentially talking about, for lack of a better phrase, the kind of gamification of skills development in some ways, and this is a term that I've heard more and more often in kind of curriculum development of individual courses. I'm curious to hear what you may think about the gamification of assessment. There are some classrooms that I've seen that are starting to kind of adapt models, where instead of using traditional grading processes or examinations they will instead turn the entire curriculum into a gaming process itself. I'm curious to know if you have any input on that or any experience with that.

QUESTIONER: Thanks very much. I do want to say to Brent that you said what you did with the bricks was easy, and I think everybody else in the room saw a highly skilled teacher doing something in a really eloquent way. But the other point I wanted to pick up was you talked about failure, you know, we dropped the bricks and we learned from that and we were motivated by that. And people this afternoon have talked about the importance of teaching and the value of teaching and all of those sorts of things. But if we're going to in some way move pedagogy, then we're going to have to allow teachers to try some stuff out and fail and make mistakes. And I just wonder how at system level we support them to do that so they don't get blamed, as you said, but actually they're actively encouraged to try to do things in different ways.

MS. KWAIK: Thank you very much. Maybe one or two more questions. The gentleman right here and then the gentleman right there.

QUESTIONER: Thank you. I'm (inaudible). I'm with Creative Associates International. My question is regarding what you said, Brent, about engaging with the process of learning. And I don't know what your opinion is on education technology in this context, as what I've seen so far in the education technology realm, and I work in this space, is very much output driven. So a program is able to assess the result of what the learners put in, but not the process. And I wonder if you see that danger

that we're sort of going back to these kind of assessments rather than actually moving forward as you'd like to see I guess.

QUESTIONER: I'm interested in pedagogy and demagoguery I suppose. If we look at what we've got going on here, we're talking about how we develop teachers in a way that follows that road to pedagogy. And I'm not sure how much things have changed since Socrates was saying to Plato, you know, have you gone in the gymnasium today. Actually the relationship between the teacher and the student is exactly the same. And I'm interested in the discussion that we're having and around how it culturally reflects a pedagogy, which is a point that Christopher brought up, as able to enrich and develop and enhance that primary relationship, which is between teacher and student.

MS. KWAK: Thank you very much. That's a great question. And we have one more question up here at the front.

QUESTIONER: Hi there. Sorry, I'm really shy to -- I didn't want to shoot my hand way up high, but I'm thinking of this as we've been talking. This has been a really great final panel to end the day on. I just wanted to say that. And I'm thinking because the first activity that we did with the blocks. You know, it's not a new activity for me. I've already experienced that growing up. Maybe for you all it was a new experience, but I have ADHD and so growing up during a time when it was really a hot topic in education, the over medication of children. I wasn't medicated as a child, but I was lucky enough to have a mother who was involved in special education and so she gave me the same tools to play with, the same objects and manipulators. And I had teachers who helped me focus in class without using medication. And so now I'm wondering will we add that tool to the general everyday classroom. While the medication issues are coming up again through time, with people with learning disabilities, are they being exposed to these tools and having these same opportunities?

MS. KWAK: Great. Thank you so much. Great. So we have a great set of questions here. The question about trust, what are actually trusting the teachers to do, gamification of assessment, how do we better support teachers if we're talking about a pedagogical approach that really has a lot of failure involved, dangers of going back to old forms of assessment, how do we get at cultural reflexive pedagogy to really enhance the relationship between the teacher and the student, and this question of inclusive learning, how do we ensure that these sorts of activities allow for the all inclusive sort of

educational and learning opportunities for children.

So I will let you all kind of jump in.

MR. SLADE: Can I jump in with the first question?

MS. KWAIK: Go for it.

MR. SLADE: I believe if we want teachers to be empowered, to be active, to be co-creditors, that we need to trust them to take control of their classrooms, take control of what they teach, take control as much as possible of how they teach. You look at the best examples out there globally around education and they are all systems which have strong levels of trust in their teachers. I think it was even last week Andreas Schleicher OECD PISA was talking about the same thing, that you will not see a successful education system that does not have trust in their teachers. You look at Finland and they give them a huge amount of autonomy in not only how they teach but what they teach. They give them lots of trust. It comes down to a basic I think human nature as well, that if you don't have that trust and that respect then you are going to be more inhibited in what you do, you're going to try fewer things, you are going to feel more responsible if things don't go right. What we're trying to develop, at least the work that we do at ASCD, is really empower teachers to be not only leaders inside their own school, but leaders inside the education sector. And so one thing we're pushing as well is not only encouraging teachers to take control of what they teach and how they teach, but have them become more in control of themselves as leaders and how they can share that expertise across schools, across districts, across countries as well.

So I think without -- it's ironic that here we are in the U.S. and we're talking about levels of trust that we provide to our education profession where we've seen -- and it's not only the U.S., but the U.S. has been a pinnacle of it, a lot of criticism of the teaching profession and individual teachers in particular, and then we look around and say why don't we see greater improvement in A, B, C, or D. Well, you know what, it might be because we have this reaction which is very often negative towards teachers in this country. And I think if we actually -- it could be the chicken and the egg, but I think if we actually changed some of that conversation you would then start to see more progress as well.

MR. YALUKANDA: I think I concur with Sean that teachers need to be trusted and be allowed to make professional decisions within their classroom setting. I'm saying so because the

curriculum itself is broad, but the teacher needs to contextualize the curriculum within their setting or their environment. Now, if you allow -- you tamper with the teacher, you want them to teach the way the curriculum is at the national level, different parts of the country -- for example, my country is big, South Africa is big, America is big -- you can't teach something in D.C. in a similar way you are going to teach in (inaudible). So you allow the teachers to make that freedom to contextualize the way they are teaching. That's why in the past three years in Zambia we have moved away from teachers' handbooks to teachers' guide. Because the teachers' handbooks were prescribing what the teacher is supposed to teach stage by stage, but the teachers' guide just provides a guide and the teacher is able to work it around the context of the society in which they are living.

Then in terms of gamification, it's a difficult thing in terms of my country, particularly in terms of technology. We may use the local games to do a few things, but using this for assessment poses serious challenges to us, unless maybe developed countries, advanced countries like U.S., UK, Finland. So that's what I can say.

MS. KWAUK: Thank you. Do you have a comment on the gamification?

MR. HUTCHESON: Yes. Gamification, just pick up on that, and perhaps talk a little bit to the teaching process with technology. What we are finding, which is really interesting, is that my belief is still that the manipulative is essential. So the technology becomes a manipulative. And if children are given a process where they're able to manipulate the technology, so for instance, robotics, some type of robotic device, if children were able to manipulate that by looking at the information coming in, assessing that information, getting the robot to make a decision based on the information coming in, and then asking the robot to do something when that happens, they get instant feedback whether that has worked or hasn't worked. So that's gamification of the assessment process. You don't need a teacher -- I still don't think we need teachers to do assessment. I think that the more we allow the children to do self assessment, which is what they do after school for the rest of their lives, the quicker we do that, the quicker we get them to actually understand what they're going to have to do for the rest of their lives.

So I still believe that manipulatives are the way to do that, but they need to see something concrete. I think the process needs to be concrete in its original form and the abstract ideas can develop after they have a working understanding of that.

So I think it answers hopefully both of those two questions.

MR. SLADE: It also comes back to what we mean by the word assessment as well.

MR. YALUKANDA: Yeah.

MR. HUTCHESON: Yeah. Exactly.

MR. SLADE: Because we use it too often as assessment meaning outputs. We're going to assess whether this child has met this benchmark or not, has scored this basket or not, whatever, whether or not those metrics are the correct ones. And what we're talking about in terms of embedding it into the teaching is actually a more formative assessment. And what you're talking about now is actually getting the individual and the child themselves to be self reflective on how well they are and what they are is succeeding in the process.

MR. YALUKANDA: I think in addition to that it's very important that the teachers they do their formative assessments to evaluate their actual delivery of the classroom because if the teacher doesn't evaluate what they are teaching everyday it becomes a problem to improve for the future. So let's think that the teachers -- if we allow the children to be evaluating themselves, I don't know what the teacher will do because the teacher will base the evaluation on the new strategies they are going to use for the next lessons. So I think it's important that the teachers in their daily lessons they do the formative assessment and then evaluate their lessons and plan and also identify the weaknesses which will help them to help the children who are not doing well in class or who are lagging behind.

Thank you.

MS. KWAUK: So I'd like to go back to this point about that all of you have raised, some of our audience members have raised, and Susan raised it in her question, is in time with the point about mindset change and the need to really get kind of more alignment between kind of the aspirations for breadth of skills and the actual realities on the ground, what about Susan's questions in terms of how do you create that system that's supportive of the teachers. So we're thinking about not only changing the minds of the teacher to think about going from substance to process, thinking more how to be creative and innovative with a curriculum that might be a little bit more prescriptive, but what about the larger system? How do we move to push more alignment between expectations of what teachers should do -- you know, you spoke about criticism. I mean perhaps one of the biggest barriers to adapting some of

these approaches is the fear of failure or the fear of being criticized for not doing their job. So I think if we maybe can push that direction I think it will help us more forward beyond the sort of teacher-teacher focus. How do we create more supportive systems?

Yes, Sean.

MR. SLADE: Well, what you sort of realize is that change doesn't need to come as a monolithic. We open the door one day, tomorrow morning, and everything has changed, the policies have changed, the classrooms have changed, the processes have changed, the resources have changed. Change is going to come about by various means and various levels of from the ground all the way up to mission policy and everything else. So change can come about by the individual teachers themselves, it can come about by groups of teachers. One thing that we are blessed with at the moment is the internet -- and cursed in some ways, but also blessed -- is the internet and the ability of people to actually form networks, form coalitions, form groups, try things out. There is nothing stopping teachers in sharing expertise, developing networks. Not only again across classrooms, districts, states, but across countries and start to try some of these things out.

There is a -- how many teachers are there in the world? I know Education National has 31 million, so there's a huge number. I'm not sure, there's probably another -- you know, double that perhaps, let's say. But there are millions of teachers. That is a force to be reckoned with, and that is a force to be reckoned with as long as they start to band together and as long as they start to share expertise. One thing that we are again in the process of developing this year is what we're calling a network of networks, which is we're calling 10 global, which is the teacher education network global, which we're hoping to get as many organizations as possible, that includes Education International, that includes ASCD, it includes Ashoka, it includes i10 Center for Teacher Quality, and others, but sharing resources, but also providing platforms where teachers can get together and share ideas.

So we don't need to see change in one step, we will see change in bits and pieces and pushes here and there. And I think that the teacher force has not been a force which has been adequately mobilized and brought together for change in the classroom.

MR. YALUKANDA: I think more importantly is that we don't need to ambush the teachers. We need to prepare them for the change you are talking about. Most of the time we tend to

ambush the teachers. So let us prepare the teachers, what do we want the teachers to do. Because the teachers are not here, we are here talking, they are not here -- how are we going to prepare them. So for me I feel that it's important for us to prepare the teachers for what we are thinking is right for the children.

MS. KWAIK: Brent.

MR. HUTCHESON: In terms of preparation of the teachers though, the way I like to think of it is this -- I'm a teacher, so I'm here (laughter) -- the way I like to think of it is that I'm really glad that the parents of the children that I taught in my first year aren't here right now because they'd probably be throwing the bricks at me (laughter) because as a first year teacher there is no way I had any idea about what I was really doing. And it's really easy to say let's just prepare these teachers. It's not easy, it's a really difficult job. And I think what we should do is reward the teachers that get past five years because those are the teachers that we really need. And when I say that the way I can say it to people who aren't teachers and haven't experienced the classroom, I could say it to you like this, think of yourself as a new young parent. You know, you've been given all the advice in the world, just like the teachers were, you were told exactly what's going to happen and what to be prepared for and what to do. And none of you listened to anything you were told. (Laughter) It's difficult. And I think the teachers going into their first year find it just as daunting and just as difficult. And they're working with individuals that are all different, just like you as a parent has to face when you have your own children.

So I think we have to -- I think Susan was getting there, but we have to give the teachers a certain amount of time, we have to trust them to experiment responsibly in the classroom, we have to give them the platform to be able to try that, and we have to give them the tools and let them find out what processes work for them in their context, in their environment, going back to the culturally -- looking at which activities or examples are culturally relevant and have meaning and have bearing. And most of those teachers would be able to go back to a cultural experience and use that in the classroom. Going back to what you know to help somebody understand something that they perhaps don't yet know.

I think if we can get that idea in and start realizing that we don't at universities, at teacher training colleges, we don't produce perfect teachers.

MR. YALUKANDA: Let me just say, on the contrary. I'm of the view that a teacher is not supposed to experiment with the children in the class. What we need to do with these teachers coming

out of college, we need to give them a mentor. The mentorship is very important to prepare the teachers for the long term. But if we want these teachers to start experimenting in the classroom the effect, long term effect on the children they are experimenting on may be disastrous. So we need to mentor. Maybe have a special program of mentoring the teachers who are coming out colleges so that we really develop them gradually until maybe after a year or two years. That's when we can let them freely practice.

We have back home established regulatory authority where we are tracking down the training of teachers from colleges and universities. We index any college which is recruiting teachers. The Teaching Council of Zambia must index all the teachers or training teachers in the college. We look at their qualifications before the colleges take them on. So we will track them down until they graduate. Even when they graduate they have to come to register with the Teaching Council for them to practice in Zambia. So that's where you are mentoring them, and also give them a mentor, the next one year they will be in their field -- they will have a mentor who will be helping to develop as they settle down in their teaching life.

Thank you.

MS. KWAUK: So I'd like to go back to the question by one of our audience members about inclusive education and how in a typical classroom a teacher might be really inclined to teach to the stronger students or maybe to the top of the average of the classroom. But the kinds of activities that you led us in today, how can this perhaps open up space for more inclusive education, not only for children with learning disabilities or physical disabilities, but even thinking about cultural stereotypes around gender. You know, what girls can do, what boys can do, what girls can do, what boys could do or not do. Maybe if we could talk a little bit about that piece and how kind of the breadth of skills movement might allow us to have some discussion about the more inclusive sort of education.

MR. HUTCHESON: I'll start.

MS. KWAUK: Go for it.

MR. HUTCHESON: It's a wonderful question and I think that in Africa, and in South Africa definitely. And in Africa I think these really large classrooms with a lot of children in gives us an indication of who difficult it is and perhaps what it will be like to have children with disabilities in the classroom. So if you have a classroom of 60 students with no disabilities it's probably the same as

having a very small classroom with one or two disabilities. It's a quite difficult place. And I think that you have to find something that allows you to engage every single person. That's really important.

So even in this room right now most of your brains are crying out for a break or some coffee or some air and whatever. And so what happens is you need stimulation. So most of you will have picked up the bricks by now because they're the closest thing to you if you haven't got your cell phone (laughter) and you're probably manipulating those in your hands right now, getting stimulus, getting some type of feedback. And that's because all of you need to be stimulated. And every single child and every single classroom is wanting that same stimulation and wants that same -- you know, the teacher to give them the same kind of time. And so I think using manipulatives and using clever strategies or the breadth of skills and experimenting with the breadth of skills in group work and whatever allows us that opportunity, allows us to put class of 60 into groups of 6, allows us to give every single child something to manipulate, to play with in their hand, which means that every single child has to be engaged and can't be worrying about what the rest of the class are doing. And I think that the children that we're sitting in the classroom with ADHD -- and I think I had ADHD when I was small as well and wasn't medicated, and I think a lot of people that do know me probably think I still have ADHD (laughter). But I think what was needed was a way to just keep me engaged and just to keep me -- it doesn't matter if I have the bricks in my hand, I'm not listening any less to anybody else or what anybody is doing. It might be putting one or two other people off in the room, but it's not changing my engagement. And sometimes asking children to sit in the classroom quietly and wait for somebody else is really difficult for children. And I think children with ADHD or other disabilities really struggle with that process.

MR. SLADE: When you look at some of the most progressive classrooms, and we do have some here in the U.S. as well, we have a great school up in Arlington across the River, Discovery Elementary, that's retreaded their whole school environment to be very hands on, to be very interactive. They're assuming the teachers are going to be doing project based learning, cooperation, collaboration, in every single lesson. And so the chairs are those ones where you can bounce up and down on, they have balls that people can squeeze. You know, they're outside, they're doing this. We need to get away from this mindset that education and teaching has to be -- unfortunately we have it here to start with -- in rows, and that it has to be assuage on the stage, which is delivering the wise words, and we have to move

more quickly than what we're currently doing to understand that effective education is developing learners. And we are coaches in that prospect as well as opposed to deliverers of content. And I think if we go along that path we'll be doing the kids a great service and if we go along that path we are therefore not afraid to have kids who are doing different things in the class. That group over there doing something, this group over here doing something, those two individuals in discussion about their work, because we know that they're working towards this bigger goal and they're doing it in the process that's most effective for them.

I'm a former PE teacher and I've always said to many people that I think in the area, even though you're teaching children and youth, via the avenue of teaching PE you can have some of the most effective teachers out there. Unfortunately some of the least effective as well, but we'll focus on the positive. Some of the most effective teachers, if you have a class of 30 or 40 and there are 7 or 8 stations of physical activity and balls going around and modifying games and changing this and instilling in the kids that they can change these rules, those rules, those activities, and all of the children are doing different things, but they're working towards the same goal. That I think is actually ideally a really good demonstration of effective teaching and learning.

MS. KWAUK: Thank you. Christopher, you have the last word.

MR. YALUKANDA: I think it's very important that no one is left behind. Inclusive learning is what we are talking about. So the teacher must ensure that every child, regardless of the status of the child, must be attended to. But as I indicated early on, there are serious challenges in some of our classrooms because of the number of sizes. You really want to give attention to individual learners, but the time and the class size doesn't allow. But teachers strive within the difficult conditions to try and attend to all the learners. You can't segregate the learners, everyone must be given an opportunity to learn.

MS. KWAUK: Thank you so much. I don't know, I kind of feel like we should leave on a positive note. (Laughter) Maybe we can say one key takeaway from each of the panelists of what you would tell a teacher that you learned from today's session.

MR. YALUKANDA: Yes, I will tell the teachers that they have a difficult challenge
(laughter) --

MS. KWAIK: Positive note.

MR. YALUKANDA: Yes, but everyone relies on them and they must take up the challenge to ensure that the children acquire the skills for the 21st century. Otherwise after the 21st century people look back and say where were the teachers who are supposed to facilitate this acquisition of this knowledge. So the teacher must be up to the game.

MR. SLADE: My positive is I think the teachers are going to become more and more empowered in the profession in what they do moving forward. And I think, at least for me personally as an educator, the 21st century learning skills, more holistic, whole child approach is the reason why I got into education. It wasn't to teach content, it wasn't to teach to pass some test, it was to teach future citizens and have every child realize their full potential. And I think if teachers understand that that's what their role is, they then will naturally become more empowered.

So I'm more Pollyanna-ish in that I think we're entering a very good period in education, which will empower the people who are part of this system.

MR. HUTCHESON: I think the message to teachers for me would be that quite often as a teacher when you're sitting in a classroom and you have 60 children in front of you and you're bogged with the assessment and you're bogged down with teaching to the end result and handing in all the requirements that you need to give, you very seldom think about people that perhaps are thinking about your problems and trying to solve your problems. And I think the message to the teachers is that based on the panelists that I've seen just today, there are some incredible people doing incredible work around the world trying to make their lives easier. And to hang in there because it really looks like things are going to get better.

MS. KWAIK: That's a much more positive note to end the day on. (Laughter) So thank you all so much for your attention today. I hope you all will join us next door and in Saul Zilkha for a reception. You'll also find several iPads available to sort of explore and tinker with and take a look at the breadth of skills visualization that our team created in order to help visualize sort of the movement of this breadth of skills movement through policy documents and mission statements of different countries.

So I hope you will join me in thanking their panelists for their time, and thank you for your attention today. (Applause)

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