

BLOSSOMS in Saudi Arabia

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Chancellor, professors, Dr. Larson, Elizabeth, ladies and gentlemen, good afternoon. I'm very honored today to be standing amongst all of you to share our experience on producing BLOSSOMS. For the last couple of days, it was amazing to attend these sessions that are very informative, are very profound.

And it's time-consuming, and it takes a lot of time to unfold. While on the other hand, this experience of BLOSSOMS that I'm going to share with you, within 18 months from scratch, went from not having any idea about what BLOSSOMS is about to producing 20 videos and training 400 supervisors among the kingdom. So the message is it's wonderful to be part of a program that is doable, has an impact, and then you can see the difference.

To begin with, managing a project, I adhere to deadlines, and I bargain for time. I'm used to that, number one. Number two, I like everybody to be engaged. It is after lunch, and I'm warning you I'm used to working with educators who have a lot of load on their back. And yet they have to be actively engaged. So please be actively engaged. And to engage you, I have this question for you. It's a math question. Does the Braess Paradox mean anything to you? If it means anything to you, stand up and say, yes, in a loud voice. I'll give you a clue. OK. Anything? Any idea? All right. Those of you that it doesn't mean anything to them, still stand up and say, nay. What? I haven't heard you. Right. OK. Got the message.

Now if you want help about that, go to Saudi Arabia. Saudi Arabia can help you. Go to BLOSSOMS' site, and one of the lessons is called the "Selfish Driver and Traffic Planning." So see what's the connection? Braess Paradox, Nash Theory of Equilibrium, pure math calculations, yet it was connected to traffic planning. This is what BLOSSOMS is all about. Today, this is our roadmap. We're going to look at Saudi in context of education, quick, quick, quick. Human capital is Saudi's real wealth. Transferable skills, the level of it in Saudi Arabia, the project, a tour, the impact, challenges, and lessons learned, and what is really the vision.

I want to tell you, everybody talks about Saudi, but in reality, Saudi Arabia is a very, very young country. In 1932, the country was founded. At that time, only children of wealthy people could afford to have a kind of literacy, so around 10%, even less, the literacy rate was. In 1938, oil was discovered. In 1951, there were 222 schools with 29,000, almost,

students. In 1964, the first government school was established for girls. In 1999, there were girls schools throughout the kingdom. And in 2002, there were around eight universities, and in 2010, there was a total of 25 universities. Do you see? It starts really slow, and it's picking up, and it's making up strides. Now we have announced 5 million students, half of which are females, in all levels of education, higher education and in normal school. So the literacy rate now is even more than 83%.

Now when we talk about Saudi Arabia, we all think it's oil, it's money, it's dollars, it's wealth, right? Right. This is true. I'm not saying it's wrong. But the reality is Saudi's real wealth is its youth. Can anybody guess the percentage of young people, younger than the age of 24, how much is the percentage of the population? The population's around 27 - 28 million. Any number? I hear 30%, 60%, OK. Well, let's look here at the comparison. Now Saudi Arabia, 48.2% of the population is under the age of 24. If we compare this with the States, 33.7%. UK it is 30.1%, and Canada is 28.4%. So this is one fact that we really have to bear in our mind.

The other fact is education. There are lots of plans that are put on. But when it comes to transferable skills, there was a study that was made – it's a bit old, maybe 2008, 2009 – in the United Arab Emirates, it was called “The voice of the CEOs.” They really had interviewed CEOs on all levels, and they said, are you satisfied with the level of skills, the transferable skills, and the skills that an employee needs as critical thinking, problem solving, teamwork, creativity, innovation, et cetera? And in Saudi Arabia, 22% of the CEOs were happy with the level of skills. Now this is not too tragic. Because, remember, still there's a big population over there. That's our young. So these can be trained, and a lot could come out to them.

The government is really aware that it's a young population. There are so many skills that they have to learn. Because after all, what is the objective of education? It's to have the proper skills – the intellectual, the social, the psychological, to be able to function in whatever capacity that person is found. Because of this, the government was always very generous in really dedicating a big budget for education. In Saudi Arabia, the average is more or less about 19.3%. Now remember, the public expenditure is a big amount. So when we're talking about 19.5, it's around \$58 billion dollars. It's a lot of money, and it is really distributed among schools, among universities, about sending people with their families to acquire the skills. So when we compare this to other countries, you can see that Saudi's public expenditure that is dedicated to education is really quite high.

Now with the awareness of the government that really we have to do something about education, we really have to take care of these children, there was a plan and there's an institution that was formed just to take care of education. It's called Tatweer for short. It's quite a long name. And Tatweer really had put a strategy that is long-term and medium-term that really had covered everything that anybody can think of. They had a pilot project, and there are so many lessons learned. So for those of you that think that Saudi is really moving very slow, it's not. It's doing a pilot project and collecting experience and

information. Now they are ready to move to make strides. And they are making strides all the time. Between achieving that long-term vision and now, what is this solution? The solution is small initiatives that seem to be simple, but they are profound, and they have a great impact. One of these initiatives was the BLOSSOMS.

BLOSSOMS was an agreement that was sponsored by the Saudi Aramco. We would like to thank them very much. And MIT, again, their international contribution to betterment of the world is really highly appreciated. And they had contracted my organization, which is the Science Center – it's called Sultan Bin Abdulaziz Center for Science and Technology – to execute this project. The project entailed having 20 videos that were translated, subtitled into English in 18 months, and to train 400 math and science supervisors nationwide on the usage of BLOSSOMS and on the new pedagogy of BLOSSOMS. Again, to enhance critical and problem solving and just thinking skills. Now I would not dwell much on that, because of the time.

When we did these 20 videos, it's not easy. We had to have so many meetings. We have to have an outreach – universities, schools, institutions – to tell them what BLOSSOMS is. And it takes a while for people to know really. They think, oh, it's not a bad idea. I just have a lesson, I say something for two minutes, then I get an activity, then I go back. And this is how simple it is. It takes a long time to understand that the lesson is like a jigsaw puzzle. It's a big picture. And every segment, I unfold part of the picture. So not until the end of the lesson that the whole objective is achieved. There's this suspense, this interest, this passion that the students will develop. We want to finish this lesson to know, what do you want us to learn? So this was very interesting, for me, and for the whole team, that again I would like to thank.

When we had to decide, of course, with the MIT international team, we thought some of these lessons their theme should address some universal and regional problems. For example, there's a lesson called, "How Does Biotechnology Clean the Environment?" See, this is a problem everywhere. The connection between water desalination and making pickles. That, again, is fresh water. There's the problem of fresh water everywhere. The disease of our time, diabetes. Many parts of the world are suffering of this. The selfish drivers, which is the Braess Paradox and traffic planning, because Saudi really has a lot of traffic accidents. And in many parts of the world, people are acting in a selfish way while, in reality, they are delaying the whole process.

BLOSSOMS is about thinking globally and acting locally. Give it a flavor, a local flavor. And really people not only will watch, like the gentleman now asked, there's a lot that we can show off and tell people about our culture. At the end of the day, we all are one. We may look different. We may speak different. But in reality, we all are human beings. We have mind, heart, and spirit, right? So this is the message. But we have our own culture, and it's nice for people to be closer to us. So we have some of the lessons. They have culture relevance, for example, the geometry of parabolic sand dunes. Those countries that have sand dunes will love it. In Pakistan, the physics of donkey cart, amazing. You

see what is the culture that is going on. We have a lesson called “Arabesque Groups – Where Are Meets Mathematics.” And I know Dr. Larson, he really was so passionate about this lesson.

BLOSSOMS is targeting high school age, 15 to 18. So we tried to find issues that interest that age group, for example, the physics of racing cars. See, Saudi Arabia, they have lots of cars, so it depends on every area. The magic picture, again, how would you hide it in a document? Then we have some general topics, like connections in the plane without crossing, why a bee hive has hexagonal shape, et cetera, et cetera.

Now let me show you, again, a quick tour for two minutes about the Saudi video. The impact of this after we spent 18 months, it's amazing. First of all, the process. All those stakeholders, be it videographers, teachers, professors, even at the organization that I work for, they start to look at science differently. They start to look at everything in terms of: “oh, we should make it interesting.” And what would it lead to? How can I connect it to their real lives? So science is not anymore in the lab and in silos. It became integrated in our life. These videos, they have thousands and hundreds of visits per month in Saudi Arabia, only these 20 videos. There are much more visits to the actual BLOSSOMS site, 200 visitors per month from the Middle East, and 90,000 people worldwide up to May that visited these 20 videos. As you noticed, there's the different flavor. And if you really watch these videos, you will notice that each one is different.

Now these videos, it had plenty of pain but plenty of gain. We had some challenges related to ideas. In the beginning, to break people's mindsets and the paradigm, to think out of the box wasn't easy, because they always thought of perfection. How can I be perfect? Well, perfection is a myth in reality. These videos, are they really perfect? Of course they're not perfect. Could they be better? Of course they could be better. But if we waited till we get the perfect idea, we wouldn't have done anything by now. So we learn by doing. We have a certain benchmark that we really try to achieve. But of course there's always room for improvement. So the idea was not easy. It took a lot of outreach until, when we met with 500 people in so many occasions, we got 50 ideas. And out of the 50 ideas, we had a special committee SME, Subject Matter Expert. We came up with 12 ideas. 12 ideas were sent to MIT, and we only got the first 5. The 20 videos, by the way, they were in four milestones. We did the first 5, knowledge was generated, and then we applied, and the subsequent ones were much faster. We had lesson developers.

You have to know that the target audience that we are working with are teachers, either university professors or school teachers. Their plates are full. They're there to teach. And then after their working hours, they have to think about all this. So really to motivate them and because, in the beginning, they feel very motivated, then they run out of steam, and you have to have a lot of passion and a lot of strategies. Thank god I'm a management trainer, so I had to walk the talk, right? And I had to test myself. We had managing expectations. Normally, sponsors, they want to have a show for their product quickly. And normally they'd say, well, is three months enough? It's what? Three months

for 20 videos? This is not like a popcorn that we're going to put in a machine, right? So we had to manage their expectations. It was very challenging for the videographers,. Because, see, videographers are people who are used to production, to have scenarios, and to work on that. This is their expectation. While a BLOSSOMS videographer is a partner.

After a certain age, when the concept is really crystallized, they have to sit together and they come up with the ideas. We had logistics, lots of logistics, and every country has logistics. And then we had to do a lot of networking and building a relationship. My vision, in intake of this, is we really have to think globally and act locally. Well, there is one fact. We are all interconnected, and we are becoming interconnected by the day. We learn better when education is relevant. And to have education to be better, we have to think out of the box, and we have to look at our environment, at our culture. Once we do that, people's learning styles, everybody should have something to relate to. The bigger the pool of videos that we have, the more we will enable the high schoolers to enjoy and to be happy about this.

I want to tell you just one thing. These 1,100 visits per month is not very common. Because people, if they're not evaluated and there's no certificate, if there's no test, they will not go voluntary to a site and look at a video for fun. They look at YouTube. But this is the impact that we have created. People willingly, voluntarily, out of their own volition went and watched the video. Universities, they really have a duty in their communities. They have to serve their communities. Because it's a win-win situation. I contribute to the betterment and to the deeper understanding of high schoolers. High schoolers, when they join university, the bar will be much higher. So there could be community service, preparation schemes, and the resource sharing. This way, the education will be better. Now it's so important, this aspect of cultural understanding and awareness. So when we share ideas, we do share the culture, and we become closer and more understanding to each other.

And finally, this is how I see BLOSSOMS: it's a platform for sharing and for support. Believe me, if you come up with an idea, MIT, Dick, Liz, and the team are amazing. They just will walk you through, and you will not even feel it. So keep BLOSSOMS blossoming. And I have just a last request. We are here from 49 countries. These 49 countries, they have hundreds of universities, thousands of professors, thousands of individuals who will have the passion and the capacity to come up to make the world a smaller village. So please come on board, whether sponsors, whether lesson developers, because we become more connected to each other. Thank you.