The Case of the Virtual University of Tecnológico de Monterrey

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Thank you very much for being here and listening. I have an experience to share with you, which is the Monterrey Tec Virtual University, and Monterrey Tec itself as a system. Monterrey Tec is a private university. We started back in 1943, so it is 67 years now since we were founded. We began in 1943. This is the original house that was Monterrey Tec in 1943. This is Monterrey Tec now. So we have come a long way just in the Monterrey Tec campus in the city of Monterrey.

Now we, like many universities in the United States and other places, have grown in the same city in which we were founded. However, at the same time— and this is interesting and unusual— we ventured outside of Monterrey. We decided to go to other places, to other cities, and to other levels at the same time. So we created a system in which currently we have 33 campuses throughout the country. Those are the white dots that you see in there. We created a different university system, which we called TecMilenio, which already has 32 campuses and 25,000 students. We began this about six, seven years ago to reach people who could not afford to pay for Monterrey Tec. Then, 20 years ago, we began the Virtual University, which is already reaching 23 countries and offering mainly master's degree programs. However, we do some other things that I will relate to you, and we currently have more than 12,000 master's degree students all over the world, in 23 countries.

These are some of the campuses of Monterrey Tec. We decided to go with campuses that were as good as the ones we have in Monterrey, and those are some of the cities in Mexico. You may recognize some of those names and some of those campuses. We decided that to be big is not contrary to being good. In some institutions, in many places around the world, there are those who think that there is a contradiction between being big and being good. We do not believe that to be the case.

We also decided that TecMilenio, a smaller, less expensive campus, nevertheless had to be good, nice, and oriented toward the students. TecMilenio has a different educational approach. This is a typical classroom within TecMilenio, and this has something to do with what Robert just mentioned, about having a classroom in which it's more like an art gallery than a prison. This is a faculty member interacting with students, very collaboratively, in activities within the classroom.

This is where we have reached so far in Mexico. We are a prestigious university, being big, reaching a lot of people, and having different levels. Moreover, one of our accomplishments is that 22% of the CEOs of the largest corporations in Mexico are Monterrey Tec alumni. We also account for 22% of the state governors. We don't know whether that's good or bad, but that's a fact. We did not intend this to happen, and pretty

soon we will be blamed for the troubles of the country, but that's how it is, and we are trying to do something about it. It is also interesting that 51% of our alumni have owned a business after graduation. We are very much involved in entrepreneurship programs and in trying to instill in our students these capabilities. All of these campuses represent only 3% of higher education in Mexico. Out of the three million university students in Mexico, we have 100,000 of them. That's our share of the higher education program in Mexico.

Every ten years, we do two things: we define our mission, and we identify the challenges that we can help solve. The last time that happened was in 2005, so we're halfway to our 2015 mission. We defined our mission at that time— in 2005, and it still holds true— to be as follows: "Monterrey Tec educates persons with integrity, high ethical standards, and a humanistic and social perspective, who are internationally competitive, and who are citizens committed to the well-being of their communities."

We do things explicitly to accomplish these three things. We not only have very good lectures and very good teachers, but activities for the other two aspects of our mission. We try to provide our students first with some basic skills and competencies like math, physics, chemistry, some specialized engineering tools and knowledge, and then also with a series of competencies for life. These competencies are well defined, well established within the curriculum, and properly assessed. Actually, if students do not acquire these types of competencies, they cannot graduate, just as they cannot graduate if they do not get the basic or the specialized skills they need for their own professional life. So this is consistent with the mission.

We also identify the challenges of Mexico. There are many challenges in Mexico, including security and narcotics, about which there is little we can do. But there are some challenges about which we *can* do something. We decided that there were four societal insights— because we've defined this in consultation with society— that we could do something about. Those were: improve the competencies of Mexico, based on the knowledge economy; help with job creation; strengthen public administration and public policy; and develop educational and sustainable models for Mexico.

For the first insight, we decided to create a series of research centers all over the country to improve competitiveness. We have been quite successful so far in creating these centers in different cities, as you can see there.

For the second insight, job creation, we decided to create a series of incubators and technology parks. So far, we have eight. We will have 13 within the coming year. We have already had an impact on about a thousand enterprises. All these companies have been helped by Monterrey Tec faculty, students and administration, in the incubation acceleration of companies in Monterrey. We so far have generated about 62,000 direct employee jobs. However, this has, of course, many indirect effects that are not reflected here. These are some of the enterprises we have created all over the country, and you see, in Mexico City, Guadalajara and other places, in both institutions.

Thirdly, to strengthen public administration and public policy, we created the Graduate School of Public Administration and Public Policy. That was five years ago. We offer eight master's degree programs, and have about a thousand students. There is one Ph.D. program. We do this in collaboration with other very prestigious institutions around the world, including Harvard, Georgetown and the University of Barcelona in Spain.

Finally, in developing educational and socially sustainable models, we decided it would be interesting to take all that we have learned, especially using technology that I will mention in a moment, and use it to help the poorest people of the country. As a university, we have to strive to be leading edge, with high technology, biotechnology, research centers, and similar areas of expertise. But we cannot forget about people at the very end of the societal ladder, and those below the poverty line. Within the gap between the haves and the have-nots— or as important, in the difference between them— lies the measure of the level of prosperity of the country.

So we decided to go and take care of them, and we created a series of community learning centers to provide education, to foster entrepreneurship and to provide some applied knowledge, especially for our students. Our students, as part of their social development, have to work in these community learning centers. They have to work in these incubators, and be the tutors using technology to provide all these kinds of educational materials, including to middle schools and high schools. These places are in very isolated communities around the country. When we began this project, the government said that it could not be done. “If rich people cannot learn using technology, how are poor people going to learn?” We answered by saying, “Well, they are poor, but they are not stupid, and they are probably more likely to learn because that's the only way they have to learn.” And that proved to be true.

We began with 32 centers, some nine years ago, and have grown, within Mexico, to more than 1,600 centers. You'll see them all over the country. Plus, we have clustered them together in 63 social incubators, to incubate community projects, very small projects— $500, $1000 projects, even $100 projects— for them. These centers have really made a difference in the communities they are in, as people begin to find out what they can do by communicating, using the Internet, with people who are in other places. By the way, these are the centers in Mexico. We already have about 300 centers in the United States, because the Hispanic population needing knowledge is not limited to within Mexican borders. We have centers in the Dominican Republic, in Columbia, and in other places as well, with the same model.

So these are the four challenges, and we decided that we are very committed to making a difference in the country. All of these challenges are being surmounted by technology. We have, from the very beginning, embraced technology as something that can help education and can help our goals. We have a long history of using technology in Mexico. It began back in 1963 with the first computer and in 1968 with the first computer science degree. We set up a satellite system to deliver education back in 1989, so we're already 21 years into it. We then decided to require all of our students to own a laptop— that was banned back in 1998— and we set up the community learning centers, as I mentioned,

some seven or eight years ago. Our corporate universities have wireless networks, and you have them.

Every year, we ask ourselves again how newly invented technology and the availability of new communication speeds can be put to use for students within our campuses, and for students outside our campuses whom we now reach through what has proven to be a successful idea and enterprise, the Virtual University. The Virtual University in Monterrey Tec is a little bit different than virtual universities in other places, in that we decided to put all the prestige, all that we have as an institution, behind it. We took that risk, and it has had a big payoff, because now the Virtual University is a very integral part of Monterrey Tec. Everything we do is supported and backed up by the top level of the administration at Monterrey Tec.

We service students from different levels. We have, with the private sector, of course, the longest continuing education and master's degree programs. We also have public officials, because we decided to offer a master's degree especially for them. We have nongovernmental organizations— NGOs— and journalists. We have elementary schoolteachers. We are training about 22,000 elementary schoolteachers every year to do a better job with their kids in their classroom. We try to instill in these schoolteachers some of the ideas that Bob just mentioned in his presentation about how to use technology and modern pedagogy to teach kids. We are helping, beyond the community learning centers, undeveloped communities. We also have courses for our own consumption, because we are so widespread around the country that some content cannot be delivered in every campus face to face. We use technology to teach the undergraduate students at these places.

We have an educational model in this endeavor. Some of the ideas here you've already heard from Bob. The educational model has to do with the creation of virtual communities. That's the best way to learn: by sharing knowledge, by helping others to learn. So we establish communities of several students working together, helped by a professor and/or a tutor, remotely. The learning strategies involve collaboration. The students engage in problem-based learning, project-oriented learning, collaboratively, in the cases studied. These are the typical activities that students undertake while they're taking a particular course.

This self-learning and collaborative learning— and here are some examples of self-learning activities— are not unlike the types of things done by other students in other university systems. In collaborative activities, working through the Internet using whatever media they have— whether it be chat, blogs, Wikis or whatever they have— they engage in problem solving and project development, case studies and what-have-you— all collaborative activities. All these activities, of course, are supported by a series of educational resources: multimedia, databases, the media library, podcasts— "the whole enchilada," as we say in Mexico, for these types of activities. Anything that we can make available for the students to render the learning more meaningful and participatory, we do. And of course, all this has to be supported by the technological platform.

How do we produce all this material? Well, it's very labor intensive. We have found that this is the most important part of what we do, not the most important per se, because the tutoring and the participation of the faculty are very important, but in terms of the quality of the program that we present to the students that in the end makes the course more attractive and makes the students more committed to it.

So we have a production team— actually we have several production teams. We have about 200 people working here, and these are world-class production teams. They really are. When I get people in Monterrey and show them what they need to do, I always say, these are the guys that make the magic of the Virtual University, of distance education. We have to put together a group of people, not only the faculty member, but tutors, web editors, instructional designers, and graphic designers. We put them together in a room for 12 weeks, and say, "Well, you don't come out of there until you have a beautiful product that you can show off to the world." And they do.

They do this constantly and consistently. We produced, for example, during 2009, 580 continuing education courses, and 221 graduate-level courses. These are full graduate level courses. It takes a lot of time to produce a quality graduate-level course. We produced that many. We produced over 124 social-program courses and 78 high school, graduate, and undergraduate programs. So this is a big effort, very well regulated, and very well established. I think that if somebody is going to found another virtual university, there is a lesson to learn from us, and that would be to invest as much as you can in quality people to produce high-quality courses. This investment always pays off very handsomely.

How do we deliver the courses? Well, we do so with the students at the center of the educational process. We have to provide them with a series of administrative and academic services, and we do this online, of course. Students interact with three types of real persons. First is the faculty member, or the professor in charge of the course. However, this professor may have— as we had this semester, in one particular course— 1,600 students. It's therefore impossible for the professor to communicate, even with "chat" or other media, one-to-one with his students. So for every 25 students, we have tutors, who are coordinated by the professor— by the "guru," as we call him— and they are the ones that maintain day-by-day communication with the students.

However, students felt that nobody knew about them at Monterrey Tec because they had a new faculty and new tutor every semester, every course. Because they are remotely located, they have no faces to associate with. Well, they may have a picture, but no more than that. So we decided some years ago to develop the academic counselor. This counselor is assigned to students when they register, and stays with them for the whole curriculum— for the whole master's degree program or the whole diploma, whatever it may be. The counselor knows things about the students that the tutor or the faculty member doesn't know. He is the guidance inside the program, helping the students decide which courses they are going to take.

To give you an example, every time I meet with an academic counselor, I begin to ask questions about the students. I think of random names, and say, “Tell me what you know about him.” And they begin by telling me, “Well, he is taking these two courses.” And I say, “Well, I can find that out by looking at his file.” They may reply, “Well, he studied previously for an electrical engineering degree,” and I reply, “I know that. I have his file in front of me. Tell me something that is not in here. Tell me, when did he last go for a vacation? Does he have a pet? What's the name? How many kids does he have?” This is the type of thing that you need to know. Being a student online can be a very isolating experience, because you are by yourself, and we have to take that into consideration for the design of the course.

I always say that we have about 20 volumes of experiences in Monterrey Tec. Nineteen of them are our failures. We have probably one with something that could be considered our successes. What we are always trying to say is, if you want to learn about failures, come to us. We have a lot of them to show to you, and please don't go to them again. Try to avoid as many as you can of the mistakes that we had to go through in these last 20 years. The academic counselor was an idea that has proven to be very successful.

We have 100,000 students, remember— face-to-face traditional students— and about 12,000 online students. In the evaluation of the learning process, or the academic process, the survey that we do every semester, we consistently show better results with the online students than with the face-to-face students. This is because of the care that we take to make their education as good as possible. Moreover, to foster, to encourage that dialogue, of course we have a series of learning resources that you may know of: evaluation, lectures, simulations and the like. We have a series of technological resources available to help students, faculty and academic counselors to communicate, and we have a technological platform that ties all this together.

This has been an experience that we have had for the last 21 years. It began, not as a great mission, but because we required it due to our geographical dispersion. Having to deal with these different teaching capabilities in different campuses around the country, wanting to have a standardized quality, we said, “Let's establish a system that helps us to standardize the quality of teaching of Monterrey Tec all around the country.” We have grown out of that, of course, by far, by going to other places— to other cities, to other countries— and having students from around the world. I think that this is an irreversible path. We agree with Chancellor Clay’s words about this being something that is good not only for students without access to a traditional university, but for everyone.

We have a commitment now with Monterrey Tec that all students, by the time they graduate, should have taken at least two courses through distance education. They will do this not because they cannot take them locally, but because of what they will learn from the actual experience of taking distance education courses. They will develop skills that are difficult to develop otherwise. At the very least, it ensures that students will acquire capabilities like finding things on the Internet, communicating properly among

themselves, working collaboratively, and working with people from other cultures and from other worlds.

We think that this is a good experience so far, and I think that this teaching model, to reach— as we have found— not only upper, higher-echelon students, in terms of economic power, but all students. We, or rather, you, can go a long way. We at Monterrey Tec are really committed to having all students, as part of their training, embrace the use of technology to help the poorest people in Mexico. With that, I thank you.