

INTERVIEW WITH

MICHAEL HORN

Co-author of **Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns**

Presented by Lenovo and Intel

The following is a full transcript of Lenovo and Intel's interview with Michael B. Horn, conducted by Carol Anne Riddell on Friday, May 20, 2011.

We're here with Michael B. Horn, co-founder and Executive Director of Education at Innosight Institute, a not-for-profit think tank devoted to applying the theories of disruptive innovation to problems in the social sector. He is also the co-author of the book *Disrupting Class -- How Disruptive Innovation Will Change the Way the World Learns*. Thanks for talking with us today Michael.

MH: Thanks for having me.

CR: First off -- can you explain what disruptive innovation means -- specifically what it means in terms of schools?

MH: Absolutely, and it's a confusing term, right, because it implies lots of things in the English language, and often when people hear *Disrupting Class*, they get nervous. But it's actually a process that simplifies products or services that were historically expensive, complicated, hard to use, very centralized, and it transforms them into ones that are far more accessible, simple to use, affordable, far more customizable. And so we see it in education, in this process of online learning specifically right now, that's really allowing far more people to both access a high-quality education, as well as to customize it for their different needs and solve a lot of the budget crises we see coming down in schools right now.

CR: So do you think that on-line learning could be the disruptive innovation -- the innovation that changes everything -- when it comes to education as we know it today?

MH: I think it's the first Disruptive Innovation that we've seen in education, I think it may open the door to other ones, which could be very exciting. But it's the first one we've seen that has that technology enabler that can really scale across the entire system and not just be for one segment of the population. It's really something that can benefit everyone's lives, which is what makes it unique from a lot of other things we've seen sweep through the system.

CR: So how would school districts really have to change the way that they're currently doing business in order to take advantage of that kind of online learning and that disruptive innovation -- are there specific policies that you see would need to be completely overhauled to make that happen?

MH: Yeah, so I think in the narrowest sense that school districts are already grabbing onto online learning; we know that over 70% are doing something with it. The question, I think, is will they use it to truly transform the system into a student-centric one, that can customize for different student needs at different times, and there I do think that there are some policy things that really need to be freed up. The biggest one is that districts, and specifically schools, have very limited autonomy over their budget. Everything is categorized and very micromanaged on how they can and can't spend it. So it's hard for them to take a strategic view of how they would implement these technologies to really overhaul the learning model. The other part of it, I'd say, is we really need to stop paying based on seat time, how long a student is sitting in a class, and really start rewarding schools and students for moving learning, and pay based on student learning outcomes.

CR: You mentioned the technology being student-centric. Can you explain a little bit more about what you mean by that?

MH: Absolutely. It's interesting, we all know this intuitively that students, and all of us really, have different learning needs at different times in our lives. Sometimes we grab onto a subject really quickly and immediately understand it, other times it takes us longer. We have to grapple with it, struggle with it, and so forth. We all bring different levels of background knowledge and so forth to a topic, and so you'd expect that our school system, to maximize everyone's chances of learning, would customize for those differences, and yet, that's not at all the way schools work today. They're based on a monolithic factory model that basically teaches the same thing at the same pace on the same day to all of the students. To really unleash the power of this country and educate every child successfully, we need a system that can customize, be built around the student, in other words, student-centric, and take into account those differences so that every child can learn at the pace and the way that makes the most sense for them.

CR: It's certainly an idea that makes sense, but what would it look like, Michael, if I were to walk into a classroom where that was going on? What would that look like, and would it even be, actually, in a typical classroom, or would some of it be taking place outside of a typical classroom?

MH: Yeah, and I think the reality is we're going to see lots of different arrangements in many different ways. We're seeing some great examples already. If you go to Yuma, Arizona, in this school called Carpe Diem, they have a huge learning lab in the middle of the room where students basically have offices. They get to decorate them and personalize them, and then they're learning on a computer and getting basic instruction and then there are break-out rooms around that learning center where students get to go out with teachers and really get small group or individualized instruction on an as-needed basis. They're all moving at different paces and the teachers are getting constant feedback on how they're doing so that they can personalize and create these learning opportunities that are appropriate at the right time. Another example is an elementary school in Los Altos, California, that I actually visited yesterday. Very interesting school where the students were using Kahn Academy for their math subjects, and they're all doing different concepts at different times. You even have 5th graders doing calculus right now, it was unbelievable to watch. And the reality is, some students obviously weren't ready for that, but because of the computer instruction, you can adapt and individualize for those different student needs. And the teachers role was really to make sure that each student was proceeding at the pace that they needed; whenever they struggled, he would dive in and work with them, and he got to spend far more time individually with each of them in a week than most teachers get to spend individually with their students in a semester.

CR: You know, it's interesting that you talked about 5th graders, because I think most of us are familiar with the idea of on-line learning for adults. But it's not something that we typically think of as much in a K-12 classroom. I think if I have this correctly, you projected that by 2019 about 50% of high school courses are going to be on-line. But how do you see us getting from here to there as a country?

MH: Yeah, and you're right about the adults. It's happened there much faster, right, corporate training – about 50% of it, maybe even more, is already online. University, higher education, has been shifting online increasingly, I think nearly 40% of students are probably taking at least one online course right now in the university setting. In K-12, it's been slower to adopt, but it's actually rapidly increasing right now. Four million students in 2010 took at least one online course, and what I think you're seeing is that as schools are having to cut back, they can't offer the advanced courses they used to offer. Credit recovery examples, for students and so forth, these areas, what we call non-consumption, where the alternative is literally nothing at all. Schools are using online learning to still be able to offer those learning experiences to students, and gradually giving more and more of the curriculum, over time, to those experiences.

CR: And as far as curriculum, what do you think schools and educators are going to have to do in terms of curriculum, and also in terms of teaching methods, to make this individualized learning really sort of take root in their schools? I would imagine that a big part of this is training the teachers to integrate the technology as opposed to having it just sort of sitting there, added on to the classroom.

MH: Yeah, I think this is the biggest challenge, actually, to get to this individualized, student-centric world, which is that the teacher's role is going to be very different. Rather than being the center and sole repository of knowledge and lecturing the same thing on any given day, you're going to have students doing lots of different things at lots of different times. So your role as a teacher is much more going to be a mentor, motivator, that problem-solver who's coming in and helping the student on an as-needed basis with problems. It should be a much more rewarding experience, because most teachers got into the profession to work with students and really see them excel rather than just deliver one size fits all lectures. But it is a very different pedagogy from the one we're teaching right now. I don't think it'll be so much of a training on how to integrate technology, I think we'll start with technology as the constant for the student and then basically say, Now what's your role? It turns out that you're actually just as vital, if not more vital in this world, but it looks very different.

CR: I think that, you know, that's an interesting point, because I think that a lot of people who might not be as familiar with what you're talking about, would argue, Well, you know, you're going to lose the human connection, the human experience there. A computer can't mentor a child. We need to have teachers interacting on a constant basis. But if I'm understanding you correctly, what you're saying is that teachers would actually, in some ways, have more interaction with a child than they're able to at this moment.

MH: That's exactly right, and we see it already. Teachers who are teaching online report that they get to know their students far better in the online, even in a distance environment, than they do in the typical, traditional classroom, which is really fascinating. And the reason is because they have far more time for those individual conversations, not just around the learning needs, but How are you doing in life? What are your goals? What's going on at home? Things like that, that are really important to benefit learning and so forth. And one way to think about it, I think, is that we're allowing computers to do what computers do really well so that we can free up the teachers to do what humans uniquely do well.

CR: That actually is a great explanation and a good way think about it. It seems like we hear about some new explosion in technology almost every week -- it's changing so quickly. Computers are faster, they're smarter, they're more mobile than ever – do you think that there's any one particular technological trend, I don't know, for example tablets or something else, that is a real game changer in terms of this individualized learning?

MH: I agree with your premise, I think that's actually one of the most interesting parts about this, but it's also some of the most bewildering. I think there's a commercial out right now where every second you buy a device, two seconds later there's another one and you're already out of date, right. But it's an exciting thing, because what it's doing, broadly speaking through tablets and mobile devices and so forth, is it's bringing down the cost of computing dramatically so that the digital divide that for so long has been an obstacle to the ubiquity of technology and solving a lot of problems, that's starting to wipe away. We're seeing disruptive innovations repeatedly in the computing space, and I think that's a really exciting thing. What I think we're likely to see as a result is because of these mobile tablets and so forth, devices, and who knows what it'll look like in 5 or 10 years, but that internet access device is going to be sort of a trapper-keeper of the 21st century, if you will. We're going to assume that most students have it when they walk into school, and so forth, and it won't be a cost-prohibitive reason that we can't do this. For those students who genuinely can't afford it, it'll be a place where government can step in and help those students who are at that end of the spectrum. But for most people, this will be accessible and affordable, which is really exciting.

CR: That is another point, I think, in all of this, because I think one of the questions that gets raised is, if it's technology that's really going to make the difference in schools, what happens in poor districts? Do they, you know, start out in any way perpetually behind compared to wealthier districts?

MH: Two points on that. First, what's interesting with the mobile world right now, is that more Hispanics and African Americans own a mobile phone connected to the internet than do White Americans. So actually, the digital divide seems to have reversed itself in that particular area, a really interesting trend. The second thing is that this online learning world has actually taken off first in the poor rural and poor urban districts. And the reason is, because as they've cut back what they could offer, or in the case of rural schools, they've never been able to offer advanced courses. We're not even talking advanced placement courses; 25% of high schools historically have not offered chemistry or physics. So we're talking really basic, and so as a result, this has become a really affordable way for them to offer these courses that before would have cost them an entire teacher to bring in. Now they can partner with different districts and spread the costs out over many localities which makes it far more affordable.

CR: So it is sort of a game changer in that sense, I would imagine, in a remote area. Is part of it, though, mindset, also getting people to understand that this is the way to go?

MH: Absolutely, and you have to get both the parents using it comfortable with it because schooling looks very different and so you have to have thought about what your goals as a district are when you're implementing it upfront, what the strategy is, so that you can very clearly communicate that to all the stakeholders who you will be serving, and explaining why this isn't a bad thing, this is actually a really exciting thing and moving us into the future. But it is a mindset shift, nonetheless. The places where we've seen be the most successful, though, really knew why they were doing it, and therefore could really clearly explain it to those parents.

CR: Michael, you talk a lot about blended learning. Can you explain that, and a little bit about how the blend works -- how much of the old versus the new techniques should be used in your opinion?

MH: Sure thing. So I think when most people hear online learning, their first gut reaction is distance learning. They picture the University of Phoenix or something like that and they think, well, we're away from the teacher and the other students. And the reality is that we're seeing, in K-12, the growth of most of this online learning being in physical brick and mortar schools, which has started to take on this term blended learning, and we've defined it as meaning anytime a student is learning at least in part, at a supervised brick and mortar facility away from home, so generally a school with a teacher, and at least in part, through online delivery, online learning where the student has some control over time, the path of learning, the pace of learning, or the place. So that element of student control changing the pedagogy in that very clear way is a very important distinguishing characteristic of it. In terms of how it'll play out and how we mix the best of face to face with this online world, I think that's really going to depend. We're seeing six different models rise up right now, broadly speaking, of how to do this, and I think the reality is based on the philosophy of the parents, the philosophy of the school leaders, and the district's specific contexts. Different solutions are going to be right for different populations, and of course it'll be different for elementary school kids compared to high school kids. I think when you're in high school, you'll take a lot more autonomy over your learning. When you're in elementary school, you'll probably have a lot more direction from a teacher, still. So it's still being worked out, but I think the short answer is we don't know, but I think the bigger answer is that it'll look different in different places and that innovation should be pretty exciting to follow.

CR: How early do you think kids should be exposed to this kind of technologies -- is kindergarten too soon or is it too late?

MH: I think we need more research on this topic, but we see it already happening in kindergarten and working really, really well. There's a school, a KIPP school, which has been famous for its success in the charter community, that went to a blended learning model in Los Angeles with kindergarten this year, and is getting just outstanding results with its students. So the reality is, kindergarteners can do this, it's a different set of design requirements, though, and you want to make sure that the students aren't on the computer the whole time – that's not good for growth, it's not good for development. So you want to scaffold this, more online learning time the older you get, that's more appropriate as you move toward the workforce, less time when I think you're in kindergarten. It's sort of the moderation in all things is probably the way to go, but the question that I guess is, when they're in pre-K, before kindergarten, should they be going on this as well? And I think there's some early evidence that giving exposure, students exposure to certain apps, different technologies, different tablets and so forth, can be really rewarding in some really exciting ways, because they can start to learn how to do their numbers really early. We met with a two-year-old the other day who could count to 100 in Hindi, Spanish, and English. So it's pretty incredible.

CR: When I think about this in terms of pre-K classrooms or kindergarten classrooms, I wonder do you think we have an infrastructure issue as a country? I know in New York City, for example, I know many of our schools are older buildings and sometimes things like pre-K classes are not taking place in traditional classrooms. They may be in community centers and other things. Do you think that we have a problem just in terms of being able to get buildings retrofitted to adapt to this kind of technology?

MH: Yeah, we absolutely do. The infrastructure problem's a huge one right now across the country. Even if you have online access in these buildings, which we generally do, the pipe, if you will, is not big enough to support lots and lots of students doing online activities at the same time, particularly as they become more robust in their engagement and so forth with these activities, you know the technology improves in that way. That's a huge barrier right now. I think we need to get creative with the solutions, from finding ways to pool different sources of funding across government to help, to find different ways to use wireless across the communities in really interesting and innovate ways, and so forth. We definitely need some good thinking on that.

CR: Getting back to another issue in terms of the curriculum, Michael, I was interested in something that I read, that you said that online learning allows you to embed success in the curriculum itself? What do you mean by that?

MH: This goes to the heart of something that we were, when we were studying what motivates students to learn and what are they trying to get done when they go to school. One of the key things that every child and really every one of us wants to do every day when we wake up, is to experience real success, to really make progress in our lives. And when we looked at schools, we realized that they were actually structured to do the opposite. Often, you don't have opportunities to show success. Every 3-4 weeks when there's a test, and then those tests are often designed to grade you on a curve, so that the majority fail, and that's deeply demotivating, which hurts academic performance and engagement in learning. What we've noticed is that with online learning, you can always be just above a student's level, not too hard such that they get turned off, and not too easy such that it's simple and they sort of get bored. But you can have learning just above their level so that it's attainable, it's something that they can be successful in and you can embed assessments constantly so you don't even know that you're taking a test, but by answering questions through the course of doing work online, you're constantly being assessed, getting points for being successful. It's really a lot of the gaming techniques that people have realized work so effectively right now in Zynga to all these other things coming on, like Farmville and so forth. Really making success very possible, but still a bit of a challenge.

CR: I imagine that would be a big change for parents, too, because you're no longer waiting for the report card to come home at the end of the semester to find out that your child's been struggling with something for weeks.

MH: Yeah, absolutely. That feedback loop is really exciting, right, because you can bring parents far more engaged and help them understand how they can be helpful to their child, basically in real time as well. There is a mindset shift there, and to your earlier question about well, what does this mean for communicating to the communities and parents, you know, there is something to that. You might no longer be graded on an A, B, C, D, or E, right, because if you're getting constant feedback on how you're doing, presumably it might take you longer to master a concept, but we won't let you progress until you really understand it. So that's a very different way of communicating that I think we need to give more thought to.

CR: There's so much debate right now across the country about standardized exams and testing in schools and whether or not we test too much, and as a result there's not as much real learning going on. Do you have any thoughts about how testing and standardized assessments would fit into this equation?

MH: Yeah, so I think that standards, where we're saying this is what we're trying to get students to learn, those are deeply important for telling us what we're aiming for. Anything that's standardized, where it says this is the only way to get there, is a problem because it clashes with this need for customization for students. So the destination, defining that is important, but how we get there, we're all going to take different paths. I think what's exciting about this world is that assessments can be real time. As soon as you finish something, it need not be this massive testing day where we take three days off, and so forth. So that's an exciting opportunity. The scary thing, I think right now, there's a lot of talk around common core across the country, really defining what those outcomes are. That could be very good, but if we design assessments that are fixed in time, this one size fits all, not multiple pathways to show that you're proficient, that'll be a problem I think. So we want to be very thoughtful about how we do it so that we don't lock in a flawed system for, you know, another ten years.

CR: I would imagine you can't really do that mass standardized testing at a specific time if everyone's learning at a different pace. I mean, the two things are pretty contradictory, unless I'm not understanding you correctly.

MH: No, you're understanding us exactly correctly, and I think that's what's so challenging, and I'll give you an example. In the Los Altos school that I visited, you had students who were doing calculus, they're in 5th grade. The absurdity of it all was that whenever the testing day was, they took the 5th grade math test. Now, this is ridiculous. They ought to be doing whatever assessment is appropriate for wherever they are, and we should be pushing them individually to grow as students, not measuring a full cohort and determining arbitrarily that's 5th grade math. One funny thing, a reporter visited the same school a few weeks earlier and saw a student doing trigonometry and went up to her and said, Do you think this is 5th grade math? And she said, No, I think it's 6th grade math. And so you get this notion that this blows apart this notion of grades and so forth, and that really is the challenge. We have to get away from this one size fits all testing regime. Testing against outcomes will be important, but it's got to be variable in where you are at a given point.

CR: Got it. How do you think we compare as a country to other parts of the world when it comes to using technology this way? We often hear about other countries out-performing the U.S. Do you think some of that is due to the way we use - or we DON'T use -- technology?

MH: I tend to think that the technology actually doesn't say too much one way or the other about how we perform against other countries. I think there are some countries like Singapore that are doing a pretty good job using online learning in some really interesting ways right now, and they do get great results, but I think their performance tends to be a lot based on the extrinsic motivation in the country to carve out a prosperous life right now, and education is that ticket to prosperity, whereas in the United States it's less so. A lot of our prosperity has been relatively assured, so what we need online learning so much for is to make learning intrinsically motivating, so that we can have these customized pathways that turn in to what turns on a student and doesn't turn them off. That's why I think we need to grab onto it so much. There are certainly some other countries doing a better job, like I mentioned Singapore, and I think honestly where we'll see the biggest explosion in this new system is in developing countries, emerging markets where literally millions and millions of children do not have access to school, and therefore rather than replicate our failed factory model system for this world, they'll leapfrog us just like they have with mobile payments and so forth, and implement very new arrangements using technology at the heart of it to individualize and customize for their students.

CR: Do you think if we are able to embrace this kind of learning it would make us more globally competitive, make our students more ready to really get out there and compete in the world?

MH: Absolutely. And this is the biggest reason we have to do it. This is, from a country perspective, this is the biggest reason we have to do it. Allowing every child to realize their fullest potential, customizing for their different needs so that they can enjoy that success and continue to grow, that's critical. Right now our school system is built, literally, to sort kids out. So we look at the fact that there are 30% dropouts and we're shocked, forgetting that the system was built to do that. We look at the fact that 60% of students are not ready for college when they come in, and we're surprised. Again, the system was built to weed those students out. We have to reverse that mindset and realize that every single child is important to our success as a country, not only for their individual success, and build a system around that.

CR: You know, some people would say that technology has created a generation of children who lack some of the fundamental skills – I've heard this myself before, you know kids don't learn to spell because they have spellcheck. Is there the possibility of too much of a good thing here, or is it all about sort of, oversight? You know you were talking about teachers sort of watching how much time kids are spending on computers.

MH: You know I think what we have to do as a society is determine which skills and knowledge are really important and then make sure and assess against those to make sure that we're realizing that. So spelling in certain cases certainly is still important because it allows you to decode words as you continue to get older and so forth and be more sophisticated. So that's an important thing that we want to make sure students are learning. By the same token, there are certain skills and knowledges that I think won't be so important in the future. Someone the other day was lamenting that students don't learn cursive handwriting because they type on a computer. Well, that's the truth for most of us in the workplace today. So I think we have to be a little bit clear that technology's changing all of our lives, and so some of the skills that we used to value are not as valuable anymore, and think about those trade-offs in really serious ways, and use the adults to really make sure that we're driving toward those.

CR: As I was reading to prepare for this, I was interested thinking about the money piece of this, Michael, because I've covered many stories myself about schools and districts spending millions of dollars to get computers into the classroom. And yet obviously, that alone hasn't been the answer. Why do you think that is, are we not using what we already have the right way?

MH: I think that's exactly it, and you're exactly right. We've spent well over, I think \$60 billion over the last couple of decades, and that's a conservative estimate, just equipping the schools with computers. When we look at it, we see that schools have done what every organization does when they see a potentially disruptive innovation. Rather than rethink the model, and really evolve it around the student, we've just crammed it into the back of the classrooms so you can do a little PowerPoint, you can do a little Microsoft Word, even a little internet research. When we've created computer labs, we've done it so that students could learn keyboarding skills, even though that's something that most children actually are pretty good at today. But we haven't fundamentally rethought that model as we've done this, so the results we've gotten have been perfectly predictable.

CR: It's a very interesting thing. Looking at that and how much money has already been spent, what do you see as perhaps the biggest obstacle to really making this customized learning, this online learning, happen in the way that you're talking about?

MH: I think the biggest thing is that, again, right now in our school system, we hold time constant and learning is wildly variable. So you have 45 minutes in a particular class, you may or may not have gotten the concepts, too bad, tomorrow you're going to have a different concept, even though the first one was sort of a prerequisite for everything else that's going to come. We've got to reverse that mindset and make the time variable so that the learning can be constant. But that's a really challenging thing, because the whole model, both explicitly as well as implicitly, everything we think about is built around this old assumption and that's going to be the most challenging thing. When you bring potentially disruptive innovation to the system, can we re-architect it to really leverage all of its benefits?

CR: Michael, just a last question that I think parents, including myself, would want to hear your answer to, if you could give families one piece of advice in terms of getting the best education for their kids right now, what would that be?

MH: I think the best piece of advice is today, for the first time, anyone, anywhere, can learn anything. And most of it is actually free. So starting to look online for resources and really grab onto that to find the best things for your child is really an exciting opportunity because parents and students often know what their learning needs are far better than the professionals in the system. And so really being very clear about We can get you that to help you, We can pull down that Kahn Academy lecture, Whatever it might be, we can help you out, is a really critical thing. As we start doing that, parents talking to their schools and saying Hey, you've got to be doing this, too, how do we get the district and state to start realizing that that's really important and that's becoming a force. What I think is different about this online learning world is that it's a killer application. It's not just for families or students where their parents maybe are less involved or have less time. It's literally for everyone, and so all of us, all the parents and families, ought to be proactive about making that a reality.

CR: Good advice. Michael – thank you so much for your time and thanks to Lenovo and Intel for bringing this together. Thanks again.