

"Teacher to the World"...Sal Khan

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Sal Khan introduces himself on TED Talks. Can be viewed with English and Japanese subtitles, and full transcript of the speech.

http://www.ted.com/talks/salman_khan_let_s_use_video_to_reinvent_education.html

March 11, 2012 7:11 PM

The following script is from "Teacher to the World" which aired on March 11, 2012. Sanjay Gupta is the correspondent. Denise Schrier Cetta, producer. Matthew Danowski, editor.

Khan Academy: The future of education?

(CBS News)

Sal Khan is a math, science, and history teacher to millions of students, yet none have ever seen his face. Khan is the voice and brains behind Khan Academy, a free online tutoring site that may have gotten your kid out of an algebra bind with its educational how-to videos. Now Khan Academy is going global. Backed by Google, Gates, and other Internet powerhouses, Sal Khan wants to change education worldwide, and his approach is already being tested in some American schools. Sanjay Gupta reports.

Take a moment and remember your favorite teacher - now imagine that teacher could reach, not 30 kids in a classroom, but millions of students all over the world. That's exactly what Sal Khan is doing on his website Khan Academy. With its digital lessons and simple exercises, he's determined to transform how we learn at every level. One of his most famous pupils, Bill Gates, says Khan -- this "teacher to the world," is giving us all a glimpse of the future of education.

35-year-old Sal Khan may look like a bicycle messenger, but with three degrees from MIT and an MBA from Harvard, his errand is intensely intellectual. In his tiny office above a tea shop in Silicon Valley, he settles in to do what he's done thousands of times before.

[Sal Khan: We've talked a lot now about the demand curve and consumer surplus. Now let's think about the supply curve.]

He's recording a 10-minute economics lesson. It's so simple - all you hear is his voice and all you see is his colorful sketches on a digital blackboard.

[Khan: In this video we are going to talk about the law of demand.]

When Khan finishes the lecture, he uploads it to his website - where it joins the more than 3,000 other lessons he's done. In just a couple of years he's gone from having a few hundred pupils to more than four million every month.

Sanjay Gupta: Has it sunk in to you that you are probably the most watched teacher in the world now?

Khan: I, you know, I try not to say things like that to myself. You don't want to think about it too much because it can I think paralyze you a little bit.

[Khan: So if we get rid of the percent sign, we move the decimal over...]

He's amassed a library of math lectures...

[Khan: 12 plus four is sixteen...]

Starting with basic addition and building all the way through advanced calculus.

[Khan: We are taking limited delta x approach to zero. It's the exact same thing.]

But he's not just a math wiz, he has this uncanny ability to break down even the most complicated subjects, including physics, biology, astronomy, history, medicine.

Gupta: How much reading do you do ahead of time?

Khan: It depends what I'm doing. If I'm doing something that I haven't visited for a long time, you know, since high school I'll go buy five textbooks in it. And I'll try to read every textbook. I'll read whatever I can find on the Internet.

[Khan: Let's talk about one of the most important biological processes...]

Sal Khan has tackled so many subjects that if you watched just one of his lectures a day it would take over eight years to cover it all.

[Khan (lesson montage): These are huge time scales...magnetic north is kind of the geographical...and let's say this is point x is equal to, basic introduction...light, if this does not blow your mind, then you have no emotion.]

Gupta: Did you ever think about putting yourself visually in the video?

Khan: Look, if there's a human face there, especially a funny looking human face, than it's actually hard to focus on the math.

[Khan: 4,000 is 2,000 times three is 6,000...]

Khan: I don't have to shave. I don't have to comb my hair. I just press record, make a video. There might be spinach in my teeth, who cares.

Gupta: The format is so simple. Why, does it appeal to so many people?

Khan: I've gotten a lot of feedback that is really does feel like I, I'm sitting next to the person and we're looking at the paper together.

[Khan: Let me take my trusty calculator out...]

Khan: I'm 95 percent of the time working through that problem real time. Or I'm thinking it through myself if I'm explaining something. And to see that it is actually sometimes a messy process. That,

you know, it isn't always this clean process where you just know the answer. I think that's what people like, the kind of humanity there.

It all started in 2004 when Sal Khan was working as a hedge fund analyst in Boston and his cousin Nadia, a 7th grader in New Orleans, was struggling with algebra. He agreed to tutor her remotely and wound up posting lessons on YouTube. They helped Nadia, but then an odd thing happened - total strangers started using them too.

Khan: I started getting feedback like, "You know, my child has dyslexia, and this is the only thing that's getting into him." I got letters from people saying, "You know, we're praying for you and your family." That's pretty heady stuff. People don't say that type of stuff to a hedge fund analyst normally.

So in 2009, Khan quit his job and working from a desk set up in his closet devoted himself full time to Khan Academy. It's a non-profit with a simple but audacious mission: "to provide a free, world-class education for anyone, anywhere." If that goal sounds far-fetched for a guy working in his closet, consider what happened next.

[Bill Gates: There's a new website that I've just been using with my kids recently called Khan Academy. K-h-a-n. Just one guy doing some unbelievable 15-minute tutorials.]

[Khan: I was like those are just for Nadia, not Bill Gates. I have to look-- take a second look at some of this stuff.]

That's right, Bill Gates, one of the smartest and richest men in the world, was using Sal Khan's free videos to teach his own kids.

Khan: Two weeks later I got a call from Larry Cohen who is Bill Gates' chief of staff. And he says, you know, "You might have heard Bill's a fan." And I'm like shaking. I'm like, "Yeah, I heard." You know. And he was like, "If you have time, you know, love to fly you up to Seattle." And then I was looking at my calendar right then for the month. Completely blank. And I was like, "Yeah, you know, I think I could, you know, fly in, you know, between like laundry and a bath and meet with Bill."

That was just two years ago. Today, with the help of more than \$15 million in funding, much of it from the Gates Foundation and Google, Khan has been able to hire with competitive salaries some of the most talented engineers and designers in the country. The Khan Academy office has the intense vibe of a Silicon Valley startup. The team is working to create software they hope will transform how math is taught in American classrooms.

We visited a class in the Los Altos school district outside San Francisco where the new Khan Academy software is being piloted.

[Teacher Courtney Cadwell: Grab your computer, log in and then open Khan Academy...]

Right away you notice something different. There are no textbooks and no teacher lecturing at the blackboard. Instead, students watch Khan videos at home the night before to learn a concept, then they come to class the next day and do problem sets called "modules," to make sure they understand.

If they get stuck they can get one-on-one help from the teacher. Less lecturing, more interaction. What you think of as homework you do at school, and school work you do at home. It's called "flipping the classroom" and 7th grader Laurine Forget says using Khan Academy at home has given her math a big boost.

Laurine Forget: I'm not a big fan of textbooks. I thought that Khan Academy was a lot easier 'cause it's on a screen. It's easy to find the concept you wanna do.

Gupta: And now with the videos, do you find yourself rewinding it? Playing it again if you need to?

Forget: A lot, yeah.

Gupta: Do that at home?

Forget: Yeah, usually when I watch videos it's because I'm having trouble on the practices. So if I don't understand the video, I can always rewind it or pause it so that I can go back to the module and do what I learned.

Gupta: But what's the hardest part about learning this way?

Forget: I don't really think there is a hard part.

Even kids who don't have a computer at home can "flip the classroom." Eastside Prep in east Palo Alto keeps its computer labs open until 10 p.m. so kids like sixth grader Alex Hernandez can take as much time as they need to learn a concept.

Alex Hernandez: My mom, she went to school in Mexico. Some things she can explain to me, but some like she can't. So like, I take long to, like, try to finish my homework.

Gupta: How did you used to do in math?

Hernandez: Pretty bad. Like at a third grade level math. So, you know, Khan Academy has helped me. It's like, opened doors that I couldn't open. It's helped a lot.

Gupta: A lot of people have talked about the idea that "flipping the classroom" is sort of what's happening here. You take a little bit of issue with that.

Khan: I kind of view that as a step in the direction. The ideal direction is using something like Khan Academy for every student to work at their own pace, to master concepts before moving on, and then the teacher using Khan Academy as a tool so that you can have a room of 20 or 30 kids all working on different things, but you can still kind of administrate that chaos.

Khan academy has created a dashboard so teachers like Courtney Cadwell can monitor each student's progress.

Gupta: So right now, they're all working on things. And you can see that real time?

Courtney Cadwell: Yes.

Gupta: So as you sit here and look at the dashboard, you see how the students are doing individually, you can see how they're doing as a whole class, and you can figure out who you need to help?

Cadwell: Exactly. And here I can track their progress over time. I can see who's rushing ahead, who's lagging behind. I can see if they begin to stagnate.

A blue bar indicates a student knows a concept, orange - they're still working on it. But if a red bar pops up...

Cadwell: It's kind of the red flag to tell me, "Hey, it's time to step in and intervene." And I can see...

Gupta: Oh, so you can see, not only it's red, but specifically what the problem is.

Cadwell: What they missed. And you can see the number of seconds they spent on each problem.

Cadwell: I feel like I'm using my time more effectively with my students because instead of making the assumption that the entire class is weak in this area, and I need to spend time reviewing this, I can really pull those three, four, five kids, do a mini-workshop, address those needs, and allow those other students to move on to problem solving activities, or project-based learning with their peers.

So far the National Education Association has supported nonprofit technology like Khan Academy in the classroom, as long as teachers are trained properly. But as with any new innovation, Khan says there are always some skeptics.

Khan: I've seen some subset of teachers who say, "Oh, well, what is this video thing? You know, live human interaction is important." And the reason why that bothers me a little bit is that I know that's exactly what we're saying. In fact, we exactly agree with you. That what we're trying to do is take the passivity out of the classroom. So that you, as a teacher, will have more flexibility.

Gupta: Does it minimize the role of the teacher? Does it make it less impactful?

Khan: No, I think it's the exact opposite. We kind of view teachers playing the role of more like a coach or a mentor. Which, once again, I personally believe is a much higher valued thing than a lecturer.

Khan Academy's math program is being piloted in 23 schools, mostly in California. Preliminary test scores from a handful of classrooms have shown improvements, especially for students who were struggling. Official state assessments will be available this summer.

In the meantime Chief Operating Officer Shantanu Sinha says they're gathering massive amounts of data, not just from American classrooms, but from every Khan Academy user around the world.

Gupta: So you can see how many problems were done over the last 24 hours? How many was it?

Shantanu Sinha: Right now, in the last 24 hours we had close to 1.8 million.

Gupta: Wow! Not total, but just one day?

Sinha: Yeah. Yeah. Just in 20-- in a 24-hour period.

And when you take a look at total users over the last 18 months...

Sinha: Forty-one million visits from the United States. We can look in from India at 1.7 million, Australia, 1.4 million.

Gupta: Right, it is pretty amazing to think that millions of people all over the world are using Khan Academy right now.

Sinha: Yeah, it's a gold mine on how to understand, you know, what paths through learning are most effective.

Khan says they look at all that data and constantly make changes to their software platform.

Khan: We can start fine tuning things the way that Amazon might fine tune the button to help you buy that book or find the book that you want, or Netflix says, "What's the right movie for you?" We now get to do with education.

Eric Schmidt, the pioneering chairman of Google, says he's seen a lot of failed attempts to integrate technology into education - but says what Sal Khan is doing is different.

Schmidt: Many, many people think they're doing something new but they're not really changing the approach. Which with Sal, he said, "What we're going to do is not only we're gonna make these interesting 10-minute videos but we're going to measure whether it works or not."

Gupta: He was the guy to sort of make this happen? What-- why do you think it was him and not some person who was an educator or who had a background in this area?

Schmidt: Innovation never comes from the established institutions. It's always a graduate student or a crazy person or somebody with a great vision. Sal is that person in education in my view. He built a platform. If that platform works, that platform could completely change education in America.

[Khan: 17 over 9 is equal to 1.88...]

Inside classrooms it's just Khan Academy math for now, but Sal Khan believes his strategy can be used to teach subjects like history and science. And not in just elementary schools, but high schools and even colleges. But no matter how big or how successful Khan Academy gets, Sal Khan promises he'll never put a price tag on it.

Khan: The "for profits" have to mold themselves much more to the education establishment than we do. As a not-for-profit, we're just like, "What's our mission?" To educate children, as well as possible. I've said it enough times and it's in our mission statement: a free world-class education for anyone anywhere.

And that's what sixth grader Alex Hernandez says he needs.

Gupta: Has anyone in your family ever gone to college?

Alex Hernandez: No.

Gupta: So it's a pretty big deal for you? Do you think you're going to be able to do it?

Alex Hernandez: With help, or like with more like studying or like Khan Academy, I think I can get there.

Gupta: I think you can too.

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