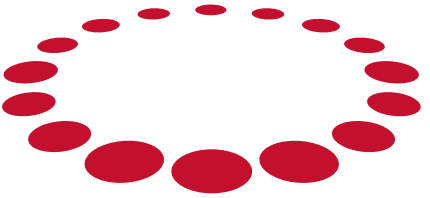

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An initiative of

In collaboration with

Transcript of Steven Hodas keynote speech
at MACBA Auditorium. Barcelona, April 5, 2017.
Debates on Education.

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First Edition: July 2017

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Publishing revision: Samuel Blàzquez
Graphic Design: Amador Garrell
ISBN: 978-84-946591-1-9

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Introduction

In 2002, Michael Bloomberg became the first mayor in the United States who got to control his schools directly. New York City is the largest school district in the United States and maybe the largest school district in the world. We have about the same number of students in New York City schools as you do in Catalonia and Madrid combined. We have about 65,000 teachers, about 135,000 employees overall and every year we spend $24 billion to operate our schools, but the district wasn't doing a very good job at running its schools. So when Mayor Bloomberg came in, only about half of our students were actually graduating from secondary school, and even those that graduated were not well prepared for university or for the workplace.

So, Mayor Bloomberg, a very clever and energetic guy, made a series of important policy changes that increased the graduation rates substantially over the first 10 years or so. But he recognized that getting a large organization, getting government to do something different isn't only about changing the policy, it's also about changing the practice, what government does everyday. Changing the culture. Changing how it works. Bureaucracies of course, they don't like to change. Bureaucracies spend most of their energy resisting change, fighting the unexpected, keeping new ideas out. That's what they do, that's why they persist so well.

When bureaucracies try to solve problems, they tend to do it in a way that looks like this. This is the New York City Department of Education procurement process. If they want to acquire any new curriculum, any new technology, it goes through something that looks like this, which can take anywhere from six months to about three years. Procurement is one of the ways that government solves problems. Government was solving

problems like this and meanwhile, the rest of the world was increasingly solving problems in ways that look like this, with Hackathons, with User Centered design, with lean start up methodology, all of which are ways of inviting the unexpected into the system intentionally, in order to help different kinds of change happen more quickly and it's working pretty well out in the world, this method.

If you want to change a huge system, just changing policy isn't enough to do that. What are you going to do? People talk about disruption, but disruption only works if you have customers. Disruption theory requires that there be unsatisfied customers or unmet demand, and of course, government doesn't typically operate as if it has customers, so disruption is not really an option. Mayor Bloomberg with the school's chancellor Joel Klein, created an office of innovation which was also known as the iZone. It was to function as both a laboratory and also as a provocation to the system itself, to get it to think differently about how it defined it's problems and it's solutions.

Inside the office of innovation, I ran a project called Innovate NYC Schools and I decided that we would take what we had learned from the start up world and bring those approaches and those processes into government to create examples of how the bureaucracy could think differently and work differently to solve it's problems. Specifically, we were going to think differently about markets and the marketplace. People's response initially was, "Why would you think about markets when it comes to public school?" The answer is, at least in New York, and I think it's the case in most places, pretty much everything that schools do, they have to buy. They have to acquire it from somewhere, whether it's curriculum or software or buildings or textbooks or teacher training, that all comes from somewhere else.

Even policy in some ways is procured by schools in response to needs that they articulate, then people come up with ideas for things to do. But what you can buy is only as good as what people will sell you and what your rules allow you to buy and how it allows you to buy it. And schools and government in general are terrible customers. If your process for solving problems and for buying things looks like this and if it takes six months to three years, you can be pretty certain that none of the really

good companies are going to want to work with you. Nobody who has a choice, nobody who wants to work for a customer who wants your best thinking and your most flexible response. They are going to go anywhere else except to here.

That's also why, if this is your problem solving process as well as your buying process, it's also why changes in policy often don't lead to changes in practice. In the US, we had 30 or 40 years of constant policy changes with a lot of arguments and big announcements and yet schools felt pretty much the same way no matter what the policy was. At Innovate NYC Schools, in the iZone, we decided to run a series of experiments, of demonstrations to show how it could be different. We decided to go directly to the users, the people who had the problems, teachers, students, principals, families, get them to identify the problems that were important to them and then expose those problems to a broad community of problem solvers, and then let those people who had the problems to beginning with judge which of those solutions might be useful, and then work with the problem solvers to improve them and to iterate them and to implement them.

So we ran three main procurement experiments while I was there. The first was called the Gap App Challenge and that was focused on problems with the teaching and learning of middle school math, like 12-year-olds. We ran something called the School Choice Design Charette, which is a kind of a design symposium to help families. In New York, you have to choose what school you're going to go to for high school. It's a very complicated and scary process, so we wanted to help make that better for parents and for kids. Then we ran something called the Chancellor's Challenge, where the head of the school system invited the heads of all of the divisions to submit problems to us to help them work on.

The Gap App Challenge was the most well known one that we did, because when we did this five years ago, it was the first time that any school district had run an open software challenge as an alternative to procurement. What we did was to take each of those phases of procurement, defining the problem, putting the problem out to the marketplace for solutions, choosing from the solutions that came in and then implementing them. We took each of those things and we said,

"Let's just start from scratch and think about this differently. How would we do this better?"

First, rather than assuming that we knew what the problem was, we spent a month with anthropologists and a design firm in middle school math classrooms, talking to and watching teachers and students and curriculum coaches and principals deal with the math problems and articulate why was it so hard to teach and learn math? In the US, middle school is where math skills just kind of fall off a cliff and where students lose interest in math. Before that, almost everybody is interested it after that, very few people are interested in it.

Then, once we had an idea of what the problem was, instead of writing a specification for a tender that says, "Okay, we want a solution that looks exactly like this", which is typically what government does. Instead, we just sort of put the problem out in a very general sense. Specifically, we were not specific about what the answer should look like, so that people could come up with their own ideas and give us their own best thinking as to what a potential solution might look like. We didn't want to tell them what it should like. Then, once we had solutions in hand, typically what government does, what schools do is, they say to schools, "Here, we've got this. Now, use it", typically, schools don't because they weren't involved in defining the problem or choosing the product to begin with.

Instead of doing that, we invited the software developers, this was all software, into the classrooms for nine months to work with the teachers, to iterate and improve the products so that they suited an urban classroom better than they would have without that collaboration. So, if we had done this as a typical tender or typical procurement, we might have had maybe six or ten companies respond. In our best hopes, we thought by doing it as a challenge we might get 40 or maybe 50 responses. We got almost 200 submissions, and we had almost 100 classrooms step forward and say, "I want to invite these developers into my classroom for the school year to help make this product better, to help make it suit my needs more closely."

The idea that teachers and students and commercial for-profit developers could work together for a common goal was a heresy at the

time. There was this idea that you had to keep this wall between the customers and the people who were making the things that the customers were buying, or else something unethical or exploitive would happen. So, when you have that kind of wall between the people who are making the solutions and the people who are buying them, you end up with products that are often not very useful because there is no dialogue.

This model of using classrooms for test beds, where the teachers were benefiting as much from that relationship as the developers were, that caught on very quickly and now in the U.S. we have hundreds or maybe thousands of classrooms acting as these test beds with small ed tech companies funded, these relationships are funded by some of the major educational foundations.

That was really successful and we used the political capital that we had developed to then go on to another problem. This time, as I mentioned, with New York City high school admissions, 80,000 kids every year have to choose a high school It's an extremely stressful process.

I have two kids who went to New York City public schools all the way through and it was a nightmare. We specifically chose something very different than middle school math, because we wanted to show that this process that we were developing, it wasn't just about academics, for example, or it wasn't just about having 200 companies respond, that this was a flexible process. We wanted to also show that it could be done in a very short time. The Gap App Challenge took about six months to work its way through. Here we gave ourselves 10 weeks.

We also wanted to show, math as something that software developers are really familiar with, there are lots of people who build software for math. We wanted to take something that was kind of unusual and strange, nobody was familiar with the New York City high school admissions process. Nobody was building software for it, so we wanted to show that this approach could work even with a very unusual topic. Given these goals, we knew that we needed a different structure, an open challenge wasn't going to work because we had a lot of explaining and a lot of nurturing to do just so they would understand how the rules work. So, instead of an open challenge we did a design Charette, a design symposium, where we selected a half a dozen different companies out of

a couple of dozen who applied. We invited them to work with us, almost like a symposium.

We brought in Department of Education admissions experts to explain how things worked. We brought in anthropologists again and also people who had designed consumer shopping sites and dating sites, to help the developers understand how people make choices, right? Because you're making choices here. It's a consumer situation. We had behavioral economists come in, and again, at the same time to orient the developers, but to give them weird ideas because we wanted them to think weirdly about this stuff. After just eight weeks, we had six applications that were released to the public, all of which took a very different approach from one another, so that the set of functionality across the six of them was much greater than you could have had from any one of them alone, which was also a pretty untraditional thing for government. They usually pick like one thing and that's the one that they want you to use.

What was really important for us was that the CEO of one of the companies that worked with us said in an interview that the product that they built for us was the best product they had ever built in their four years they had been around. To be able to take that feedback back inside to the legal department and the procurement department and say that companies would want to work with us not because we make them money but because we'd make them better, that was a really profound shift in perspective for what it meant to be a good customer.

For the third challenge, we challenged the bureaucracy to sort of challenge itself. The Chancellor was very pleased with our work and we got him to put out a solicitation to all of the different divisions inside of the department to invite them to take some complex problem, or some crazy problem, or just a weird idea and basically submit it to our design team and we would work on it with them. We got 11 submissions and we chose bussing, transporting kids to school. In New York, we spend one billion dollars a year on school buses, even though almost all the kids take the subway to get to school.

Again, it's one of these things where we spend a lot of money and nobody's happy with the service at all. So we did what we usually do, we

took our anthropologists and we went out, we waited with parents at 5:00 AM in the morning. We went out to bus depots with the guard dogs on chains yelling, and just talked to the people who ran the buses and the principals who scheduled things. And we came up with a whole playbook of projects and possibilities to improve this, none of which we ever actually got to carry out and maybe we'll talk about that.

Overall, this process that we developed, which is now not that uncommon, there are a bunch of places, bunch of school districts that are doing similar things because user centered design is a pretty well accepted and pretty well understood approach now to solving all kinds of problems. It breaks down into a few very simple pieces. The first is that you let the people who have the problem define the problem, let them speak to it. Because what a teacher in a classroom or a driver on a bus says the problem is is almost certainly not what somebody sitting in the central headquarters who doesn't deal with this every day is going to say the problem is. So if you actually want to be useful, talk to the people that you want to be useful for.

Secondly, don't tell your problem solvers what the solution should look like. They're not robots, so let them use their creativity. Let them use their experience, let them use the way that their perspective is different from yours to add value, because you're almost certainly going to be wrong about what the best answer is because you're a human being, and so you want to leave room for other people's good ideas, you don't just rely on your own. Thirdly, don't think that you're creating things for people, you're creating things with people. This is a collaborative process, the more you bring people in, I believe, the better the product is going to be, but this is also a social and a political process.

If you want people to accept your involvement and accept this thing that you're doing with them, have them be in the loop. It just makes it much more likely that they're going to bear with you and forgive you when it's imperfect and maybe overcome their skepticism and give it a shot If they were involved. Most importantly, I think, is you have to create a climate in which people are willing to take risks. There's a blogger who I love named Seth Godin, who talks about organizational change. He says, "If you want to make change in organizations you have

to do these two things. You have to increase alignment and you have to decrease fear."

That's especially true in a political context because everybody is afraid of being embarrassed. They're not afraid of getting fired, because nobody gets fired in government, at least not in the US. And so they're just afraid of being embarrassed, so you need leadership that's going to create a climate - if people are afraid of being embarrassed, They're not going to do anything different, they're not going to risk making a mistake - so you have to create a climate where making mistakes is kind of okay. And that was really what the job of the iZone was for.

It was to try new things and they didn't always work and when they didn't work we were like, "Okay, sorry, we tried that, it didn't work, let's try something else." And that's an attitude that people end up respecting. It's a way of building trust. So, when you create these high profile examples of regular people, teachers, principals, bureaucrats, thinking differently about their work and having permission to think differently about their work without worrying about being criticized, you can then use those examples to stimulate other people.

People look around and they see what the culture says, is okay. And these examples of people being unafraid to try new things, they really kind of build on one another. That's how you change practice. It's when people's everyday sense of, "How do we do things around here?" Shifts. Not because the policy is different, but because, "That's how the person sitting at the desk next to me does it and I'm going to do that because that's how we do things here." The downside of that, I don't believe you can force this kind of change, it takes time for those new things to become habits. Habits are things you do over time.

If you don't have the time, if you don't have the leadership that allows that process to take hold, then the change can be not very durable. Then, when you get a new leader or you get a new policy, then things go back to the way they were because these new habits don't have time to take hold. Again, maybe we talked about this, that is one of the things that happened in New York when we had change in leadership, people go back to doing what feels safest.

Interview

When the iZone moved from a classroom-centric model to a student-centric model, could do you give us some examples about what this approach meant for schools? What was that about?

Sure. A lot of times people would think of the iZone as being about technology. Some of what we did was about technology. In general, I think people sometimes confuse innovation with technology, they think they're the same thing or they think that innovation requires technology, but the iZone didn't start out with that assumption. What we started out with was permission, working with teachers and principals to question all of the assumptions around schools. Right now, in pretty much every place, schools are not really organized.

We take them for granted that we have teachers at the front and kids and the kids are all grouped together by age and everybody is learning the same thing at the same time. And then when you get to be at certain age, it all moves as a chunk to the next level and the school day lasts this long. And you don't do any learning outside of school, it only takes place in this building that we call school. Those are all assumptions and there are plenty of good historical reasons for them. They might even be some good educational reasons for them. But they pretty much all grew up because of the technology that existed at the time.

Schools themselves, blackboards, classes, age grouping, those are technologies. So after a while they become habits, we take them for granted, but typically, students are not at the center of that. It's not as if we put the kid in the middle and say, "Everything else is going to revolve around the kid, according to what that student needs." Typically, we take certain things for granted, like a curriculum or the length of a school day

or a school building, and we expect the kids to revolve around those things and adjust to those things. One of the provocations of the iZone is, "Well, what if we didn't have that assumption? What if we were starting from scratch?" So a lot of the schools that we worked with weren't involved with software at all. They were just thinking differently about the school day, about time and place and sequence and groupings and that sort of thing.

The iZone was mainly about blended learning and personalization. How did you develop that kind of experience? Maybe some solutions, maybe promising practices?

Yes. One of the reasons why educational innovation and technology do get associated a lot of the time, is that technology makes certain things easier. A really good teacher is really good at diagnosing what each kid needs. That's almost the definition of a good teacher. And she's able to adapt her instructional approach to give each student what each student needs to the degree that the classroom permits it. If you're working with 35 kids in a group and you have them for 45 minutes and that's it, it can be hard to do that personalization but good teachers know how to do it given the time.

One of the things that technology makes possible of course, is for less experienced teachers or for teachers who are not as good, to give them those supports, to help diagnose what each student needs and then to help deliver things differently in an individual way, so that each student can proceed at their own pace. And the fact that you go very quickly at something and I go slower at the same thing, doesn't mean you always have to be bored because I'm slow and I have no idea what's going on because it's taking me longer to understand it. Blended learning where the teacher works alongside of some technology supports, either for diagnosis or for the delivery of curriculum, is very often a part of personalizing things because it allows the kids to go at their own pace.

Maybe you could tell us some story about how a traditional school faced this kind of challenge in the beginning?

One of the things that we believed in was, "We're never going to force anything onto anybody." If a school wanted to be in the iZone, they had to raise their hand and say, "I want to do this." And it wasn't enough for the principal to say it, the teachers in the school had to want to do it as well, because there's no point in helping people do things differently if they don't really want to do it. So, once a school said, "Okay, we're willing to think differently about our problems", then each school could pursue different kinds of approaches or different kinds of challenges to problems that they were interested to solve.

We had this one school, it was one of my favorite examples, it didn't involve any technology at all. In New York and in a lot of places, when kids need extra help for something, either because they have special needs or they just need a little bit of tutoring, it can be very disruptive. The kid has to come after school or sometimes they're literally pulled out of the classroom, away from their classmates to go get their extra instruction or whatever. Nobody really likes it. The kids don't like it, it's awkward, it interferes with the school day.

So, the teachers at this one school took it upon themselves. Their challenge was, "How could we redesign the way we give kids the extra help that they need if we just started from scratch?" And they thought to themselves, "Well, who does a really good job at helping people with problems?" And they said, "The Apple Genius Bar, they do a really good job at that. So we're going to redo all of our stuff along the lines of a Genius Bar." So they dedicated one room in the school that was staffed from early in the morning until after school was over, always by a rotating group of teachers with expertise and kids could make appointments to say, "Hey, you know, I need a little bit of help with math." Or they could just drop in during lunchtime and say, "I'm having trouble with my social studies."

The teachers loved it because they got to be these like sort of Genius Bar experts, working together with their colleagues, and the kids loved it because they felt they were in control of it, it was up to them when they

did it. And there was no longer any stigma attached to getting extra help and it was much less disruptive to the regular classrooms because you weren't pulling kids in and out. To me, that's a great example of personalized learning that involved no technology at all.

That sounds interesting. The other high concept in the iZone is about the schools as centers of innovation. What are the benefits and the theory of change underlying the decision of making schools centers of innovation? In fact, schools were not designed as experimentation platforms, so how can a school make this kind of transformation?

That's a really good point. People can get frustrated with schools, because sometimes, again, at least in the US, they seem to be some of the least innovative practitioners of things. We see all kinds of services changing, all kinds of attitudes changing and schools very often don't change. That's for a number of reasons. For one thing, parents get upset when schools change. A lot of parents really want school to look like school when they went to school. They don't want people "experimenting" on their kids. Parents can be a profoundly conservative force - at the same time, they get very frustrated when they don't think the schools are doing a good job with their kid. They can be conservative, they can be very selfish.

But schools weren't designed, as you said, to be innovative. Schools were designed to be conservative. In the literal sense, to continue the practices that have gone on before. And they are well set up to take orders from the top. If the chancellor tells them to do something different, supposedly the schools will do it differently, but we all know that like when you close the classroom door, a lot of time teachers do what they want to do. Sometimes, that's a very good thing, because this idea that the chancellor wants it is idiocy and the teachers are right to resist it, and sometimes it's a bad thing because teachers also have their own reasons for not changing, that may or may not be good for kids, may not even be good for their own professional practice.

I do think that this is one of those culture things. Now, at the same time, like in any organization, pretty much every teacher and every

principal has plenty of ideas on how things could be done differently or done better. They're not stupid, and yet the system doesn't encourage them or sometimes doesn't permit them to try these new things, and it seldom rewards them or gives them even a way of evaluating whether what they're doing is actually working. They may know that it works in their classroom, but maybe that's just because of their personality and their kids. They don't have a way of knowing, of doing an experiment, right?

Schools aren't really setup for experimentation and validation for a whole bunch of reasons. Partly, again, it's about getting political permission. The system has to want this to happen and it has to reward people for trying it even when those experiments don't work out. If you say, "Yes, go ahead and trying something new", and then the instant it doesn't work you get slapped like that's the end of it. Then you also need to train people and support them, give them a practice language and tools to help them do these experiments in a way that everybody can learn from them. So, it's partly culture and it's partly training.

Which were the critical issues required to achieve this effective connection between the educational community and the technology market, because developing is about creating connections?

Yes. One side of it was really easy, the developers were desperate to get into classrooms. I don't even mean desperate to make sales, although obviously they're for-profit companies and at the end of the day they have to be profitable to survive, but they knew what they didn't know and they were willing to admit what they didn't know. Most people who -- ed tech companies, a small companies, startups, this is changing now, but again, at the beginning, a lot of them didn't have very much experience with real urban classrooms. They, themselves, were probably very good at school, they were probably very self-motivated, they probably went to pretty good schools.

Their experience was not always translated or they would solve problems that nobody else thought was a problem. Teachers would not put

that problem very high on their list and developers knew this, so the chance to be inside real classrooms on a regular basis, seeing the world through teachers' eyes and through kids' eyes was really valued by them, and they would have done anything for this, they would have crawled over broken glass in order to get this opportunity. That part of the equation was easy. Where we had to do some good work, I think, was in making sure that this experience would be valuable to teachers and to principals. They had to see a benefit to their everyday practice beyond just having these strange people in their classroom or beyond just trying new software, because it's easy for them to try new software if they wanted to.

What we came up with, we actually felt that good teachers and software developers had a lot in common in terms of how they tried things out and see what worked, but they didn't have a common language for talking about their practice. We actually, in the iZone, we did a lot of professional development. That's the heart of what we did, was teach teachers how to do their jobs in new ways, so we actually created a curriculum specifically to help software developers and teachers absorb a little bit of one another's practice cultures in ways that made each of them feel like they were now better at their jobs because they had this new vocabulary and this new set of experiences.

For teachers, they considered it really enjoyable and interesting professional development, and the principals were, by and large, most good principals have something makes their teachers happy, the principals are going to support it. Again, these were already schools that had opted into the iZone, so they were disposed to doing new stuff.

I think that we understand how it works, the relationship between the enterprise, the ed tech and the school, but what does it take to develop a school innovation ecosystem, I mean, to connect schools and to create a real community that shares knowledge or practices? To connect one school to another.

I think you said the words, I think it is about connection and it is about community. One of the things that's really tough about being a teacher,

again, in the US, and it might be different here, is that the teachers are really isolated compared to most professionals. They don't often consult with one another, they don't go to conferences, they don't read professional journals. Until very recently, they were not very much involved with online communities, and so when you close that door-- and they're were children all day long. At the end of the day they're exhausted.

Imagine if you spend all day not talking to another adult, especially if you're new at your job, it can be very isolating and it's a hard job. A lot of times all you can think about is, "What am I going to do the next day?" Or, "Man, I've got this kid and I just don't know what to do for him." Creating these professional practice communities was really important and we spent a lot of time and a lot of effort, both within New York City - I mean, you have an advantage in the city because you have density, so you have a lot of teachers in one physical place and you can actually take them all out for beer or take them all out for coffee a few times a month. It doesn't cost very much to do that. They are so excited just for that chance to talk to other teachers, especially from different schools and compare notes and that kind of thing.

If you take that basic approach that a professional community is a social community and social communities are what makes us feel good about our jobs and ourselves, it's not that hard to really do that, it's not that expensive, you just have to decide that it's important and then you have to dedicate some time, some money and some thoughtfulness to make it happen. It takes a lot of effort, at first, people are tired, they're busy, they don't see the value of it, so you have to push and push and push without seeing anything and then all of a sudden it takes off. After a while, it becomes a little bit more self-sustaining, people see the value of it and they take ownership of it.

In New York City, for the iZone schools, they would get credit for coming to these beer and coffee things that we would do, and in some cases they would get paid for it, too, because in New York City teachers get paid for doing professional development, so money was not the only reason that they would do things, but it never hurts.

It never hurts. From the experience of the iZone model, what did you learn to be required to give an impact of the technology in learning, personalization and school performance? What should we know if we wanted to develop something like that?

Boy, that's a complicated question and other people in the iZone might give different answers than I give, too, because it depends on what you value. I think that the first thing is that it takes a little while to change habits. You have to be, I think, thoughtful about how are you going to know that what you're doing is working? What does it mean if something works, whether it's a piece of software or a professional development practice or a way of arranging schools? What change are you going to look for that tells you that you have an effect and an effect that you think is a positive effect?

One of the things that's so difficult about school in general as a government service, we can all agree that the sanitation department they're doing a good job if there isn't trash on the streets. It's pretty simple, maybe there's one or two other things that we look at. It's really hard, I bet that we could not, in this room even, agree on how can we tell if schools are doing a good job because we value different things. Some people think that schools are doing a good job if they produce more engineers, some people think that schools are doing a good job if your kids are creative, whatever that means. It's very hard to come to enough agreement and then find a way that we're all going to agree to measure those things, to move strongly in a direction.

If you're doing your own little project, if you're doing your own iZone, at least in the iZone, we had a couple of very loose guidelines as to whether we were doing a good job. It was, did teachers like it? It's really very simple because this question of effectiveness, very, very complicated question. There's no one thing that's effective, things are effective in a context, whether it's software or a teacher credential or whatever, nothing is like the universal thing that works. It works with these kids, with these other supports, in this part of the country, right? If someone is not inclined to go along with you, they'll always find reasons to question your evidence because all evidence is questionable. Evidence doesn't

usually convince people to do new things. What convinces people to do new things is they like it more. I'm actually a big believer in if teachers enjoy being in school more, if kids enjoy being in the classrooms more, if parents express satisfaction, to me, that's about as good an evidence as I'm likely to get that these changes were worthwhile. If you just look at test scores, there are half the people in the United States that think that test scores mean everything, and there are other half of people who think that test scores mean nothing. They're both right. Even if test scores did mean something and things were effective, if teachers didn't like something, they're not going to use it anyway. They'll find a way not to use it.

I think having your own idea about how you're going to judge success and making sure that everybody else involved shares that, how are we as a school community going to know if we're doing a good job? Maybe it just means that we tried a certain amount of new things and we paid attention to the results and we changed something based on that. Maybe that's the first big change in the school that never looked at outcomes before or never looked at their own kind of evidence and use that as a way of adopting practice. Ultimately, in a political system, the test is, does the person who control the schools get reelected? This question of how you know you're doing a good job is a very complicated one.

That's a good point. This brings us to assessment. Everyone wants assessment. Everyone wants data, maybe for control, maybe for accountability, maybe to know if it works or to invest more or quit investment. What should be a good and quick assessment of technology in the classroom? What was your model like?

I think quick is really important. I think quick is really, really important. Quick and dirty is better than slow and precise. The typical way of validating things in schools the traditional way was the gold standard of research as a random assignment study where you try and find two groups of people who are equivalent to one another somehow. Some of them you do this to, and then some of them you do this to, and you

pretend that there are no other factors in their lives except the thing that you're doing. You do this for three years as a pretty typical period, and then you take a year to analyze the data. Then, you see an effect that's like this big. Meanwhile, it's four years later and the world has moved on, and it doesn't matter anymore because you have a new idea.

People always seem to want a lot of extra confidence before they start to do a new thing. It's like, "Prove to me that this new thing works." Well, prove to me that the old thing works. If you start from this position that everything that we're doing is working and is working perfectly, then we can all go home and have a drink. The first thing I would say is let's not ask for a higher standard of proof from a new thing than we ask for the old thing. Or at least, let's be honest with ourselves that we're stacking the deck against the new thing. We're not starting from the perfect, we're starting from what we have.

I think that there is a lot of room for evidence. The question is, what kind of evidence is going to be most helpful? Also, what's the consequence of making the wrong decision? I think that's another important thing that the iZone was very conscious of. The higher the consequence of making a bad decision, of course, the more certainty you would like before you do this thing, right? Evidence is one way of mitigating risk. That's why we want it, but there are other ways of mitigating risk. You can mitigate risk by making the consequences of being wrong not so terrible.

If I'm trying a new Math curriculum in one classroom for two months and it turns out that nobody likes it, kids don't seem to be understanding anything. Okay, not a big deal. Try something else. If I adopt that for my entire school system and I spend millions of dollars and I spend six months training all the teachers, and then I'm wrong, well, that's a big downside there. In the startup world, the way that's been found very effective to mitigate risk is to spread your risk by trying a lot of small experiments knowing that a lot of them are not going to be successful, but the ones that are are going to be worth really reinvesting in.

You can make the choice to say that schools are not a laboratory, and that schools are not an investment portfolio, and we're going to tolerate zero risk. We could make that choice as a society. Then, we'll get exactly what we have right now. It's not as if that what we have right now has

no downside or no risk because if it were, we would all be delighted with the way our schools are, and a lot of people are not delighted.

The budget of the iZone project has been reduced from 47 million Dollars to almost three million Dollars. What were the main barriers in these years that the model has faced? In a recent interview you said, "Politics play a huge role in the education policy shift. School districts are extremely political places." Could you explain that?

Yes. I mean, it does come down to politics because it's government, right? We were fortunate, in New York, to have Mayor Bloomberg for 12 years. Although, everybody got a little tired of him after a while. 12 years of anything, even something great, is a long time. He had a particular approach to government, which was, "We're going to try a bunch of stuff, and some of them will work. The stuff that doesn't work, we'll throw them out and then we'll try a bunch more stuff." That was what people liked about him. This sense of lean forward into the problem, try some things, be honest when they don't work.

It also coincided with a time in the US when there was a lot of money from the federal government. Under Obama, the federal government spent hugely more money on schools. It was actually started by George Bush. He was the one who got the legislation passed. School spending went up enormously. A lot of that was around specific programs, the program was called Investing in Innovation. There was money that was dedicated and a bunch of the iZone money came from this Investing in Innovation grant program. There were also a lot of educational foundations that were giving money to school districts to try new things.

The iZone came along at a time when there was a lot of support and a lot of money for this. It got to be quite large, maybe too large in a lot of ways, because being big is not the best thing for an office of innovation. Better to be small than big if you have a choice. We're able to do a lot of work that was funded from outside. When the new mayor came in, Mayor de Blasio, basically his entire campaign was, "Whatever Bloomberg did, I'm going to do the opposite," that was his entire campaign. He

brought in someone to run the schools who was, again, about as opposite as you can get. It was pretty clear that she did not or would not understand the work that we were doing. If she did understand, then she wouldn't like it.

This also coincided with some of the grant money running out. The iZone shrunk in the course of a year. It shrunk dramatically, both in terms of Dollars and in terms of staff. By the time I left about six months after the administration changed, I was curious to see what the change would be like. The iZone was down to about four people. It was absorbed into one of the parts of the department that it had tried to change. It was absorbed into that department and buried and basically given the instruction to do nothing new anymore, to create no more examples of how the system could be different, but just to kind of let the clock run out, to do the same things that we have been doing in 2012. They were just going to keep on doing some of those things in 2017, so by definition, really not very innovative.

The work that's going on in New York right now, there is not really very much interesting work, which is sad for me, but a lot of the examples got picked up by other school districts. A lot of this work is going on in other places now. In that sense, since our job was to create examples that other people could follow, that was good. It is, like I said, really vulnerable until you actually change people's habits, which we weren't quite there long enough to do. Another year, another two years and I think it would've stuck, but until that happens, you are really vulnerable to politics.

What do we need to design a model of education innovation that can consolidate and become scalable maybe?

Yes. Again I think the political will needs to be there. You need to have a leader who sets the rewards and the consequences. There need to be rewards for people to do things differently. I don't know enough about the structure of education here to understand what those might be. The rewards don't have to be money, sometimes freedom itself is it's own

reward. Sometimes recognition is the reward for people to be able to stand up and say, "Yes, I'm doing something different, and I am applauded for it by my peers." But that really does all start with politics, and you have to have someone who has a little bit of courage and a little bit of vision and is willing to stick with it for a while.

Then you need people to put it into practice who understand how organizations change or don't change because you're not going to have much time. But if you do create the new habit then the new habit will be around for a long time.

Talking about the educational technology markets, do you think that the user is currently at the center of the design of this market and what is currently lacking in the educational technology market? What future opportunities are there?

I think the educational technology market has really come a long way in the last 10 years. I think that small companies and startups - I mean, there are a lot of reasons for this. The large companies have consolidated to a great degree, the economics of being a large education company have really changed, the large textbook publishers, the companies that make money from assessments from large-scale assessments. You look at Pearson, based in London, which was the largest education company in the world, they basically got out of that entire business because the economics had changed so much.

I think there are a lot of openings for small companies, and I think small companies take all of this stuff for granted. All of the user-centered design, all of the anthropology. It's how they were raised. It's just what they learned from the first time they thought about making product. It's the climate that they grew up in. I think that teachers, now you have more and more companies that are started by teachers. We had this happen in New York quite a bit. In fact, one of the ironies of the New York City procurement process was that if you were a New York City schoolteacher and you left to start a company, you were not allowed to sell to New York City. Even though you probably knew better than almost

anybody what New York City teachers needed. You were not allowed to, you could actually get fined and penalized for that.

I think that's changing a lot. I think that products are becoming a lot less expensive. There are a lot more of them, products now are much better at working together with other products. They assume that it's an ecosystem of technology and that they have to play nice with one another. It's a lot easier for that reason because they're inexpensive and because they work well with others. It's a lot easier for schools to try new things without risking a lot. If it doesn't work out, they can pull it out pretty easily. I think that's all really good. It's created its own new problem though, because every problem was once a solution to another problem. Nobody starts out to invent problems. It seemed like a good idea at the time, but....

One of the problems now is that there's so much stuff out there, it's really hard for teachers and principals and even parents to know what's good. There's this discovery problem. How do I find out what's out there? There's a million different things, how can I tell you know which 10 of those 1 million are likely to work in my classroom? So now there are a whole bunch of projects under way. Again, foundation funded mostly, for-profit businesses, trying to create discovery marketplaces where teachers can go and evaluate products, pass that information on to their teachers and make it easier to find the thing that they need.

This is one of the problems with open educational resources, which are free. But there's a zillion of them, and it's almost impossible to know which of them are any good, and teachers can spend as much time trying to find something and evaluate it, as to just almost create it themselves. So I do think the marketplace is much better almost to the point of overabundance.

I was thinking, you talked about the Gap App Challenge. What were your main achievements? Maybe you could help us to visualize some of the achievements, solutions or projects developed from that initiative?

All of the work that we did I think was in some sense a performance, like a theatrical performance that we wanted to demonstrate that certain

things were possible. I wanted to demonstrate to the community of EdTech startups, that the New York City Department of Education was not actually as stupid as it appeared to be and not as awful as it appeared to be, but that actually we might be somebody that you want to do business with, that you might have a good time, that you might learn something. That in itself was an achievement, first of all for the department to think of itself as somebody who would market itself, that would try and act nice, because it never thought it had to do that. They're the largest school district in the world. People will love to sell things to us. They had this bizarre notion that because they were so big that therefore they could do whatever they wanted.

That was one of the important things, and it did actually make software developers think differently, not only about New York City, but about other large school districts because a lot of times, for better or for worse, people look at what happens in New York City, and they copy it in other school districts. So, we were very intentional about having this be very, very public. We did a lot of outreach to the media. We did a lot of promotion. We hired a marketing firm, the kinds of things that government doesn't typically do, because I knew that if we did this stuff and nobody knew about it, it would be pointless.

Creating that example of a large bureaucracy behaving differently was really important, That was a big accomplishment. This idea of bringing software developers into classrooms and creating these test beds that was a big accomplishment and that was something that, again, caught on very, very quickly and now it's going on all over the place. I think that's one of the reasons that you have better software. It also makes schools better customers because now it's not a mystery to them. These are not products that come to Moses on the mountain top, this big finger of God hands them a software package.

It's like these are things that are made by people and they're made by people with thoughts, and assumptions, and biases, and approaches, and the fact that teachers are now more sophisticated about how that happens and know how to inject themselves into the process, I think that's made them better customers. It's made better software developers, so I think that's a real positive outcome. I guess the third thing is this

idea around communities of practice. So the iZone, the communities that we worked with were in New York City mostly, but New York City, is so big we had 300 schools in the iZone. There were only eight other school districts in the United States that have as many schools as just the iZone had.

To create these professional communities that could then become self-sustaining, that was a good example not just for New York City, but again for other places to follow. I think it was great, all things told, and I think a lot of people are taking these ideas now and they're taking them to the the next level.

I know you are involved in other projects. One of them is about connecting local innovation clusters. But not all the clusters have worked in a place like New York, living in a strong technology ecosystem like New York. How does this work? What are the future opportunities for these local clusters?

Innovation clusters are an interesting idea when it comes to education, and the idea behind them basically is that you have these in many communities especially in cities. You have like a bunch of different groups that are each interested in and involved with public education but in different ways. So you have the schools system itself, the public school system, you have the universities that train teachers and that also sometimes do research into new ways of teaching, or new kinds of products.

You have the other branches of local government that are involved in economic development or social supports for kids and for families, even though they're not part of the schools, they deal with families. You have the private sector. You have whatever are the local industries who are hiring people, who are graduates of the system. Then, in some cities, you do have communities of software developers or you do have communities of investors or philanthropists. The idea behind innovation clusters is that each of these groups has their own set of interests that overlap, but not completely.

It's like a Venn diagram. They have something in common, but they have their own motivations. They each have their own ways of thinking about problems and solutions that also have some overlap, but are also really different. You have a lot of people thinking about the same thing, but for different reasons and in different ways. The idea behind innovation clusters is that if you support those communities in certain ways of working together, then what they come up with will be more interesting and more effective than if they were working alone, but you have to do something to create those communities. You have to create this common language and these common activities in order to get them to work together in ways that are different than they currently do.

In the States, there are maybe 15 or 20 of these that I would say are pretty vibrant. They have them in other parts of the world as well. Tel Aviv has, there's something. Australia is doing some stuff. There's some interesting stuff going on in London. I'm not aware if there's really nothing in France to say. I'm not aware of much in Spain, but I could be wrong about that. This is also an idea that is taking off all over the place.

Open questions

Has iZone tackled the educational inequality problems brought on by social problems?

Most of the schools in New York, most of the kids in New York and most of the schools in the iZone, were poor kids from shitty neighborhoods. It was by no means a privileged population. A lot of these schools were also thinking as creatively as they could about the other kinds of supports that these kids needed, other kinds of social services and that sort of thing. It's a huge question in general about where schools fit in the overall delivery of social services and social supports. They obviously can't do it all on their own. We expect a lot from schools and the US schools are the main site of delivery for social services for kids, including things like medical care, including things like psychiatric care.

It's a tremendous responsibility. It's a question that I really can't give you a good answer for the way in which this kind of approach would apply to the delivery of other sorts of services. I know that in New York and in a lot of cities, they are rethinking the way that social services get delivered. They are conducting what I'll call experiments in different ways of supporting families. I don't know very much about them. I think that this approach towards problem-solving could probably extend to other areas as well. I don't have a good answer to your question.

How are the companies chosen and what problems need to be overcome?

We did bias very strongly towards startups. We only worked with startups, because we knew they were interested and eager. The big companies didn't really care that much. They were not willing to have the kinds of relationships, the kind of openness that we required, so they kind of took themselves out of the picture. We looked, it was very, how shall I say, opportunistic. It wasn't so much that we said, "Well gee, math is a really important problem and next we'll look at painting." We didn't really have an agenda. It was more like, "Okay…"

Math was a good place to start because we knew we would get a lot of response. There were a lot of people already thinking about math and software and things like that. We knew it was very important that the first thing that we did be very, very visible. It was part of this whole kind of theatrical thing. The thing that we optimized for first was not, "Do we think this is the most important problem." It was, "Do we think we're going to be able to do a visibly good and interesting job in public with this first thing." It was very self-serving in that sense. In terms of if people don't like what you do the first time, then you don't get a second chance. We would optimize very much for getting a chance to do it again.

Certain kinds of problems or even certain kinds of schools, if we knew that we had certain schools that were really interested in something, and we knew because they were iZone schools and we had experience with them, we knew something about that school culture. We would kind of skew things so that the school would have a chance to try out some of its ideas and be successful. There was not really a pretense of neutrality. It was very, again, I would just say, opportunistic. At that moment in time, what seemed to be the thing that would get us to the next step, because we were very much in survival mode of wanting to build a lot of supporters and the only way to do that was to make other people successful. We were thinking about how could we make our teachers and our principals successful.

Sometimes what happens is that your funders will have priorities. The foundations that you take money for, they're really interested in

philosophy. Or they're really interested in science or something like that. It doesn't matter that much, I think, what the content area is. You can come up with something interesting around pretty much any piece of content. If it's about software, you want to make sure, like I said, with the high school admissions thing. We knew that there were not a lot of companies who were going to be interested in or able to do a good job, so we knew that we had to change the process, so that working with 6 companies instead of the 200 companies from the Gap App Challenge that we would still get an outcome that would be interesting to people.

Could you explain how many people were involved in the iZone project? And how about the costs?

When I left, the iZone was up to about 350 schools. Probably at the high point, we had about 65 staffers, 65 people. That's a lot of people. Too many, it's too much, actually, for an office of innovation. One of the reasons that we had so many people was that most of them were spending every day in schools. Doing professional development and coaching around the blended learning. Most of the iZone schools of that 300 or 350, the vast majority of them were involved in some kind of blended or online learning. That was the biggest chunk of things.

I was actually very happy when that part of the funding kind of went away. When schools signed up for that, the deal that we offered them is it's going to be free for two years, all of the software, all of the support. Then after that, if you want it you're going to have to pay for it, because we don't have any more money after that. A lot of principals did decide, principals in New York have a lot of freedom to decide what they're going to spend their money on. They decided about, I don't know the exact numbers, but maybe half of them, 150 or so schools decided they were going to keep on doing that.

My projects for the marketplace stuff, we were very small. I had four other people on my team, maybe. Which I think is about the right size. You kind of want to find a way to get other people to do the work. Not because you're lazy, but because if other people do the work then other

people will be invested in the work. We tried to act as a lever rather than as a whole machine. Just put incentives and supports out there. It's possible to do this stuff without a lot of money. I mean, we had a lot of money, but you don't need a lot of money in order to do it. I would say similarly on the innovation cluster side of things. If you take the incentives and the motivations that people have already and you try and find a way to connect those and to amplify those, a lot of times it's more about creating opportunities and activities than it is for paying people to do certain things.

Does iZone also take into account investment in hardware?

Principals are very clever. They will do pretty much whatever they have to do to get some benefit for their school. For the blended learning stuff, in fact, if you signed up for it, we gave you a whole bunch of laptops that were paid for by the foundations. Turned out that some of the principals didn't care about blended learning at all. They just wanted some free laptops. That was something that we learned after the first year. You really want to be careful in evaluating people's motivations. Now, it's not the worst thing in the world that schools end up with a bunch of laptops, even if they're not using it for the reasons that you hope they would. In fact, maybe it's better in some ways. I wish I knew what the principles did with the laptops who got them from us and then didn't care about what we were doing. Maybe they did better things than we did.

The hardware question is important. One of the big things that's changed now. When I was there, it was iPads to some degree and then laptops for older kids, because iPads and teenagers don't make a lot of sense. They need keyboards. Now, of course with Chromebooks, they're so cheap, right? They're just $200, you can keep extra ones lying around.

I don't want to seem superficial about it, but you don't need a lot of money to have enough hardware to do interesting things. I think the way that I would think about this problem is to say, "Okay, these are our goals. This is what we want to have happen in our school", and start with the outcomes that I want to see, the changes that I want to see.

Then I would work backwards from there and say, "Will this technology have anything to do with this? Okay, maybe it does have something to do with it. Okay, what role is technology going to play?" Then what's the cheapest, most flexible, most efficient way to do it? It might be that you need one Chromebook for every kid for one thing or it might mean that you need one Chromebook for every 10 kids. It might be that the most important thing is just that the teachers have Chromebooks and that the kids don't actually need one. It depends on what you want to actually accomplish.

Fortunately the hardware is getting cheaper and cheaper and cheaper. One of the things that we did, that Mayor Bloomberg did, it took him a long time. He hated having cellphones in schools. Initially, he banned them. If you were a kid and you brought in a cellphone, they took it away from you. Then after a while they realized, "These are pretty powerful computers. Instead of buying tablets for everybody, why don't we let the kids who have phones use their phones?" That worked out and a lot of school districts now have that. It's called BYOD, bring your own device.

That's a real way of cutting some of those costs and then you can spend the money on kids who can't afford smartphones. Yes, hardware is part of it. Then there are interesting questions of fairness and equity about kids who have access at home. Some kids have broadband, some kids don't. Some kids don't even have a quiet place to do their homework even with a notebook. I know a lot of teachers would never give homework that required kids to be online at home, because they knew they couldn't count on kids being able to be online at home. Then there are other questions about how do you address that. It's important, but I always feel these are solvable problems.

About the Author

Steven Hodas currently works as an advisor with the Education Innovation Cluster at Digital Promise and is Head of Product at Citymart.

From 2012 to 2014 he served as executive director of New York City's Office of Innovation, leading a number of projects, including the iZone project to bring the technology market into the city's education sphere.

In 2010 he was one of the founders of Noodle Education, a company that helps students take decisions regarding education. The company provides expert advice and exhaustive data about over 700,000 education providers and resources through its web app, including kindergartens, primary schools, secondary schools, graduate programmes, tutors, teachers and learning materials.

In the 1990s, together with NASA, he built the US government's first public website, which was aimed at connecting teachers and students with scientific resources to support STEM education (science, technology, engineering and mathematics). In the private sector he went on to create the popular websites for secondary school and university students, the first large-scale formative assessment and personalized learning platforms for large school districts.

Steven Hodas is a graduate in Education, Leadership and Political Studies from the University of Washington and is an innovator in the educational technology field. During his career, he has advised public and private entities, most recently as Digital Promise's Innovation Cluster Lead and as Practitioner in Residence at the University of Washington's Center on Reinventing Public Education.

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