

**Education Nation:
Six Leading Edges of Innovation in Our Schools**

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Good morning, everyone. Thank you, Liz. How many of you have heard of George Lucas? I think one of his films is in the theaters right now. How many of you have heard of the George Lucas Educational Foundation? I know this is an international audience. Most of our Web traffic and use— since we are based upon mostly American stories of innovative schools— comes from the U.S. But about a quarter of our Web traffic comes from other countries, especially other English-speaking countries in the UK, Canada, Australia and Singapore. So I am very pleased to introduce our work to those of you from other countries. Someone was asking me just now if our work was open and free, and indeed it is. We are a nonprofit, operating foundation. An operating foundation does not give grants, and we are not a grant-making foundation. We use our funding to operate a program, and the program that we operate is a website called edutopia.org.

Edutopia.org is a multimedia website. We work for a filmmaker, so we make films about what innovative learning looks like. This is the contribution that George Lucas and the George Lucas Educational Foundation make to this whole global movement to create 21st-century schools, universities and colleges. We use films to show you, as Cathy Casserly just did, what it looks like in the classroom. We can talk a long time about project-based learning, student engagement, community involvement, and performance-based assessment. However, in order for these changes to actually take place, we - and especially policymakers, parents and perhaps faculty as well - need to understand this change. Edutopia appeals to a very broad audience of teachers, principals, parents, policymakers, foundations and state education officials. We want everyone to understand what this change looks like, so we use film and the visual media to show that.

George Lucas once told me, “You know, a picture is worth a thousand words.” I said, “That is why you're George Lucas. That is brilliant.” And that is what we do. I thought I would just start by showing you one of our films. On our website, we have profiled over 150 different schools around the U.S. and some around the world. I represent the voice of the younger children, the preschool through high school students, and we work to get them ready to go into the kinds of community colleges, four year universities, graduate education, lifelong learning and professional education that you have heard about this morning from Andy and Cathy and Dr. Vest. I am the third in your California speakers this morning. I am very pleased to be here at the Stanford of the East. Some of us— I think almost all of us— have connections with Stanford.

I am going to show you a film, if you want to know what this kind of 21st-century collaborative learning looks like at a high school that is focused on STEM but also focused on global learning. I like these schools that do not define themselves too narrowly, because there is a lot of connection between the humanities and the sciences.

Communication, the ability to speak, read, and write well, to understand story— all this comes from the humanities and is very useful in science, technology, engineering and math. Here is a school from Chicago called the Walter Payton College Prep High School. This will be a test of how American this audience is. Does anyone who is not from the U.S. know who Walter Payton is? I once asked this question in Scotland, and there was a fellow in the back who knew that he was a Chicago Bears running back, one of our very best football— American football— players. So they named a high school after him. This is a high school that calls itself a STEM and global learning academy, trying to do both: learning a number of international languages and also focused on science, engineering and math. So let's have a look. I will be interested in your feedback on it. This was part of the Chicago Public Schools, and we filmed this about three years ago when a fellow named Arne Duncan was the CEO of the Chicago Public Schools. He is now our secretary of education.

[Link to seven-minute video segment, duration] <http://www.edutopia.org/payton-college-prep-global-language-video?page=1>

Great, so there are a number of features that characterize a 21st-century school. I would like to show you six of these kinds of features, which I call leading edges of innovation in schools. (See slide #2) I think everyone here is trying to figure out how you bring these kinds of schools to scale. I think all of you must have schools in your nations that have features of this kind of learning, but they are not yet at scale - where technology is used in a very ubiquitous way. This demonstrates a kind of videoconferencing that has now gotten so inexpensive and can provide students around the world with connections to each other. I think this is one of the most important things that technology can do. So we are all trying to figure out how to bring this to scale. Can we create an education nation? Think about a kind of a place where it is a learning society, there is vision, there is hope for a nation that really does emphasize education at the same level that it emphasizes its economy, its jobs and its military. Thinking especially of the United States, can we make education the same kind of priority as we make everything else? Because in fact, those things— economy, jobs and health care— rely in the end on education and an educated citizenry.

Can we create this ladder of learning from the very youngest ages all the way through high school and into college and career? A system where students take advantage both of formal institutions - of school courses - or of just-in-time learning of the sort that you heard about this morning from Andy DiPaolo. However, there are also more informal kinds of learning experiences from museums, cultural institutions, nonprofit organizations and public libraries. I think the digital divide - the achievement gap in this country - is largely a question of both differences in the kinds of schools kids go to and also in the kinds of informal learning that goes on.

We are coming up on June 1, and here in this country it is summertime - a long, three-month vacation. I think most education systems around the world have this, but of course that goes back to an agrarian society. It is amazing how we, at least in this country, cling to the same schedules. Earlier today the question of the 45-minute class period came up -

the school schedule or the tyranny of time when it comes to education. So I call this the third semester. Some parents, some families, are able to give their kids a very strong third semester of learning in a more informal way. They pay for their kids to go to museum programs and summer camp. They take special lessons in the arts and music. All of this contributes to an educated citizenry and to their performance in school. However, while middle class families can do it, families with lower income cannot. So here in this country I think one of the most exciting things going on is the Center for Summer Learning, an effort by a number of organizations to provide that third semester to kids from lower income families.

Universities are involved in this effort. The University of California in our state does a program called Cosmos, where kids come to their campus and learn more science in six or eight weeks than they do in the preceding 30 weeks. How is this possible? Well, you can imagine. They have qualified instructors— not just qualified, but expert science, engineering faculty. They have labs, resources for field trips, and the kind of mentoring that is so important for young people. Universities can provide this during the summer and during some weekend programs, but many K-12 schools cannot. We still have many schools, and I am sure many nations have the same problem, where we do not have qualified science instructors and instructors in foreign languages, like the ones you saw in this film.

If there is one way of summarizing what our work stands for at Edutopia, it is just to make school more authentic. We have created schools that are very artificial environments for kids. More and more kids are saying, “I have to power down when I come to school. At home I have a learning environment, access to the Internet, I can talk to my friends, I can talk to experts, I can get information quickly, but when I come to school, I do not have that access.” We just want the school to become more like what kids experience in their own daily lives. Sometimes people have said, “Oh, you have these core concepts at Edutopia.” We have project-based learning. We have something called comprehensive assessment. We stand for technology integration. We have six core concepts and teacher development for these kinds of practices, but it really does come down to these four words and an equal sign. (See slide #3) We just want school life to be more like real life. We want schools to be less isolated from their communities. We want the school to go out into the community for learning, and we want the community to come through the school. We especially want parents and other experts from the communities to come in and help mentor the kids and help teach the kids.

I like this metaphor of looking to the edges of a market or a system for innovation. (See slide #4) It comes from a book by John Hagel and John Seely Brown. They were thinking about businesses. They were saying that if you want to innovate in a business or in a government agency, look to the edges of what your system is doing, and regrind your lenses so you can see clearly what is going on there. That is what Edutopia has done over the past 15 years. We have kind of looked to the edges of school systems. The kind of school you just saw, Walter Payton High School, still is pretty unusual, but we say, “Here is a model, and if we can film it and share what it does, then more people will say this is what is possible.”

I still run into educators who often say they don't think a certain topic or a certain course can be given to a certain-aged student because it is too hard for them, that there is little achievement data and research on this to date. With regard to the idea that high school students in Chicago could learn Mandarin Chinese, a lot of educators would say, "Well, that's not possible." I have heard very progressive, very well informed educators, principals of schools, saying, "Asian languages are too difficult for American students. It takes nine years." Apparently someone has done a research study that says it takes nine years for an American student to learn Chinese, Japanese or Korean, because it is a different kind of language, with different characters. So we stick to teaching the romance languages.

My response to that is that if it takes nine years, we better get started right now. We have got to create this global society where American students understand the rest of the world. I, as a Chinese American, believe strongly that this U.S.- China relationship that you are seeing so much news about every day now is probably the most important bilateral relationship for our nation. If we are going to survive— we talked about sustainability and global survival over the next generations— we have got to make sure that this relationship is a strong one. Certainly you could look at what is happening in the news right now and say it is not going so well. We need much better mutual understanding between our two nations and that has to start with the young.

I have summarized a lot of our work in a new book called *Education Nation*. It is coming out next month. Every five or six years, we like to publish a book. We do a lot of work on a monthly basis on our website, but not everyone is watching our website on a weekly or monthly basis. So we like to put it out in book form. We had a magazine called *Edutopia Magazine*, which came out six times a year. We like these compilations, collections, the "best of" our work. We like putting it together so people can look at the 30 or 40 best stories that we've done. That is the point of my book. I tried to use this metaphor of the edges of innovation in the book. Here I list six of them, and you see them all in the story of Walter Payton High School. You see them in a number of stories we've done. The first edge of innovation is really changing our thinking. (See slide #7)

As I was saying, there is a lot of thinking about what students can learn at certain grade levels. My argument there is that the problem is it is not usually well taught. Calculus at high school level can be taught, but usually it is not well taught. Certainly most science and engineering and mathematics that is taught in our schools today is not really science, mathematics and engineering. As I think the gentleman from Nigeria said, we have a lot of classrooms that are just like your Nigerian classroom, where teachers lecture and present, where the textbook is the source of learning. I sometimes say, "The teacher does not have to be Google." We have Google for that. But in most classrooms the teacher believes that what they have between their two ears is what students need to know. It is important to have knowledgeable teachers who know their subject areas, but it is clear to us now at this conference, and has been clear for the past decade, that the real knowledge that students need to access is outside of the classroom. It is on the Internet. The sources of information, the collections of information, the databases, the museum collections—

all of that is on the Internet. The Internet does change the role of the teacher. One thing we have been trying to advocate for is for teachers to understand a new role. It has been very difficult to change their thinking about not just communicating what they know, but helping students to go out to the Internet and filter information, find the best sources of information, and create something based on the information they are gathering.

On the point of learning Chinese language, we now have an AP exam, a College Board advanced placement exam, in Chinese. It was announced about five or six years ago and has very quickly caught on. At the announcement of the AP in Mandarin, one of the Chinese ministers of education stood up and said, “I know in America you think that Chinese is a very difficult language to learn, but in China we have 1.2 billion people who speak it.” It is all about placing the learner in a natural environment for learning, and that can now be a virtual environment for learning. So the first edge is really changing our thinking and there are a number of examples about “either/or” ways of thinking that we are trying to hybridize. I like this idea of hybrid thinking into “both/and”: you can do both a STEM school and a global learning school. But it does require rethinking the curriculum. As you saw a bit in the Payton High School example, they are globalizing the curriculum, not just in math and science, but in history and literature. It is a way of looking at the entire curriculum, not just a course on global studies. Every course can draw on global content.

We are involved with a project-based “learning experiment” in Bellevue, Washington, where we are redefining an AP course in U.S. Government and Politics, which, again, has been very textbook-based and very focused on passing the AP exam. But we, along with many others, are saying that the AP exams need to be modernized for this century. Many of these exams are very textbook-based and very memorization-based. So we have tried to convert the AP course in U.S. Government and Politics into a project-based curriculum. Certainly, the idea of all Americans now becoming fluent in a second language - and maybe even a third— is revolutionary! Those of you from other countries know that it is very unusual to meet an American who is fluent in a second language. We expect you all to communicate with us in English. So as part of this globalization approach, we do want our students to learn a second, and maybe a third language. That has to start early and not just in high school.

There is a lot to be said about technology. I know we are trying to focus on the role of technology here. I think many of you are familiar with one-to-one programs. I do believe that we should think about them as the “weapons of mass instruction,” as they are sometimes called. Every student needs to have access to the Internet. Eventually, every student needs to have his or her own personal device. It is amazing to me that here in the world's wealthiest nation we still do not provide our students with a digital device. Maine is the only American state where you can walk in there and every middle school student has a laptop computer. That started about eight years ago. I thought that this would quickly demonstrate to other states that they needed to move towards this, but still, eight years later, we have not seen that. We have done a number of films about the Maine Learning Technology Initiative. You can see it on our website. We are seeing a number of really exciting things related to handheld devices.

If you look up the iRead project-- I just did a little blog entry on our site. If you just Google iRead, it is the use of the iPod for language learning. Again, in the world's wealthiest nation, we still have trouble getting nine-year-olds to the fourth-grade reading level. We have a very unenviable record when it comes to reading levels with young children. If they do not make it to fourth-grade reading level, chances are they will not make it to eighth grade or 12th grade. That gap opens up very early on. Something goes wrong from kindergarten through third grade, where we cannot get our children to a fourth-grade reading level. So iRead is a very interesting new project which uses the iPod for literacy - for reading and writing. I daresay this is mostly an audience of digital immigrants. I am in my 50s, and it is hard for me to imagine, when I first heard about iRead.. How would you use an iPod for teaching reading and writing? The iPod is something that we all use to listen to music, right? But this is an audio device that can be used with a little microphone to record a teacher's reading and to record a students' reading - so they can listen to themselves.

It is a breakthrough when it comes to teaching reading and writing. If you just try to teach kids to read using a textbook, some kids will get there, again with support from their families. Well, the figures show that some bedrooms of American children have more books in their bedroom than some school libraries do. One individual American fourth-grade student has more books - hundreds of books - in his or her own bedroom than some school libraries now have in the United States. That is the gap. There is a project in two school districts - in Canby, Oregon, and Escondido, California -where kids use this low-cost device— it especially works well with the iPod Touch with Internet access— where the key breakthrough is that teachers can listen to their students read and students can listen to each other read. As you saw earlier in that community college piece, one of the real strengths of this new learning environment is having students listen to other students. To listen to other students— how they learn, how they think about problems, whether it is mathematics or reading. This is a real breakthrough that our 21st century classrooms need to create. You create a community of learners. So in the iRead classrooms, every teacher uploads these files into iTunes. Every student has a playlist of their readings. By listening to themselves, they can improve their own reading. This is a key thing in language learning, and I would argue, in a lot of different areas.

Artists know this. Artists are constantly performing and recording their work. Athletes do the same thing. So some of the best ways of learning come from the arts and come from sports, where it is all about performance. In order to improve your performance, usually you have to record yourself performing. The iRead project has done that, with pretty remarkable increases in students' reading achievement. It is still early, but what they are showing is this idea of accelerated learning, of kids learning more in six weeks than they do in 12 or 18 weeks. This is the acceleration that we would like to see in students' learning that technology can offer. That is one of my favorite examples, and I wish I had more time, but there are many more examples on our Edutopia website about the use of technology.

This fourth edge is one that is a little— how should I say?— non-obvious. But we are changing the places and the times when students can learn. It was just mentioned this morning that adult learners want learning “just in time.” They are mobile. They want to be accessing their own learning, their portfolios and course content in a 24-7 kind of way. All that should be brought down to K-12 schools. As I listened to the presentation this morning, I asked myself, how can we design a kind of meta-school? As we are talking about a meta university, is there a kind of meta school that we could create that is built over the current school structure, but enables students to learn anytime, anywhere? How can we create this time-place edge of students learning whenever and wherever they are? There are lots of other learning places where kids learn. One of my favorites is school gardens. In many ways, this kind of 21st-century learning is not just about technology, not just about high tech; it is about reconnecting kids to the land, to the places where they grow up, to learning about their own communities, learning about their own families. Somehow, we have divorced all that learning from kids being in the classroom with reading primers.

In California especially, we have a whole movement to create school gardens. It is amazing what can happen when schools teach students to grow things. It has a lot to do with environmental education. It has a lot to do with understanding the environmental issues we are facing. One of my favorite examples is something called the Edible Schoolyard. If you Google that name, it is a project in Berkeley, California, that was originated by our famous organic chef, Alice Waters. She was walking past a middle school on her way to her restaurant, Chez Panisse. If you ever go to Berkeley, please go there. It is the world famous organic restaurant that Alice has created. She was on her way to work in Berkeley and she saw this asphalt playground at the middle school. She said, “Wouldn't it be better if there were a garden there?” These kids from the earliest middle school grades could learn to not only grow things— fruits, vegetables and herbs— but her point is to have them make their own food. So there is a lot of learning that goes on in what she calls a complete seed-to-table experience. We have made a film about it, so please look up “edible schoolyard.”

I will just try to condense these last two edges into two sentences. The question of schools of education came up. It is a big issue, hard to change, but here is something that could happen tomorrow if teachers began to form teaching teams. Just as we want students to work together in teams— you saw that in the film from the community college— we want teachers to make teams to teach: to bring in parents and local experts to teach; to create the co-teaching edge. Then finally, the biggest edge today is of our young people. I like to say they are carrying this change in their pockets. They have devices, like the iPod Touch. If they were just allowed to use them, they could really accelerate their learning.

We have done a number of stories about digital learners with support from the MacArthur Foundation. There you see three of them: Cameron, Nafeza and Louise. You can go to our website and see these documentaries. When you see these kids learning - inside school, outside of school, online - you just say “Wow.” There is a new way of learning these days - a new world of learning - and that is what we need to create. I like Virginia

because she was spending hours on Facebook and she decided to go on a Facebook fast. She is a religious girl from Georgia and she gave up Facebook for Lent. This is a story of how she did that. It is also a story of how she teaches other students. Part of the co-teaching edge and the youth edge is getting students involved in teaching and learning. This is redefining the role of the teacher and the role of the student. I think one of the most exciting things that happen around technology is that kids can help teach younger kids. We have a lot of films of high school students teaching elementary grade students. Virginia, as a middle school student, taught some elementary school students about Internet safety. I will pause it there, since I am getting the red alert! Thank you for your attention.