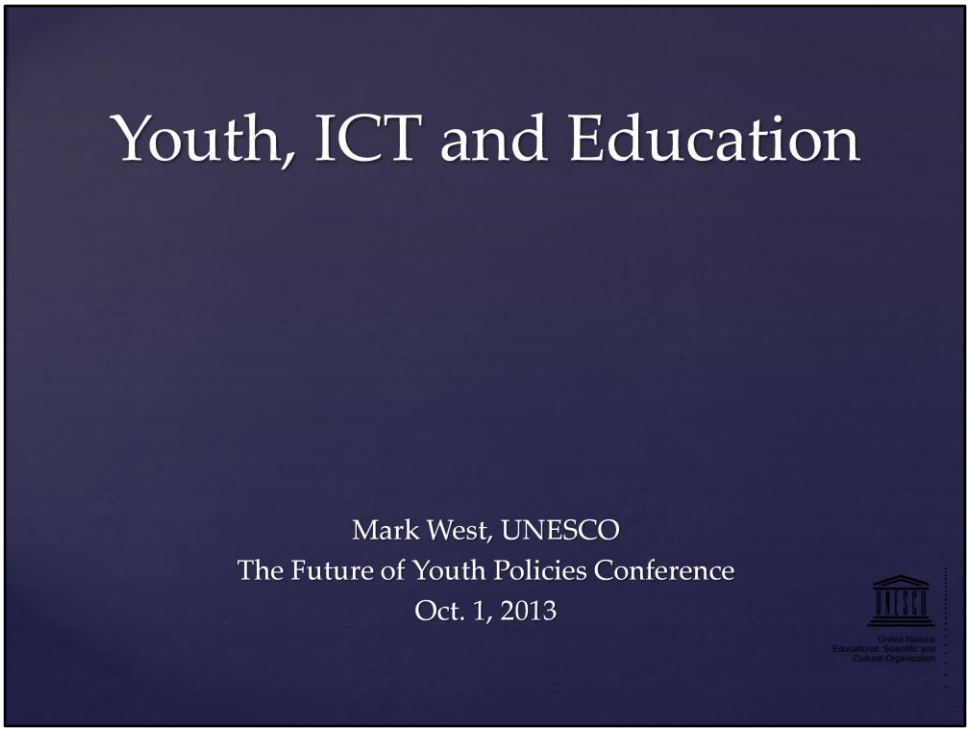
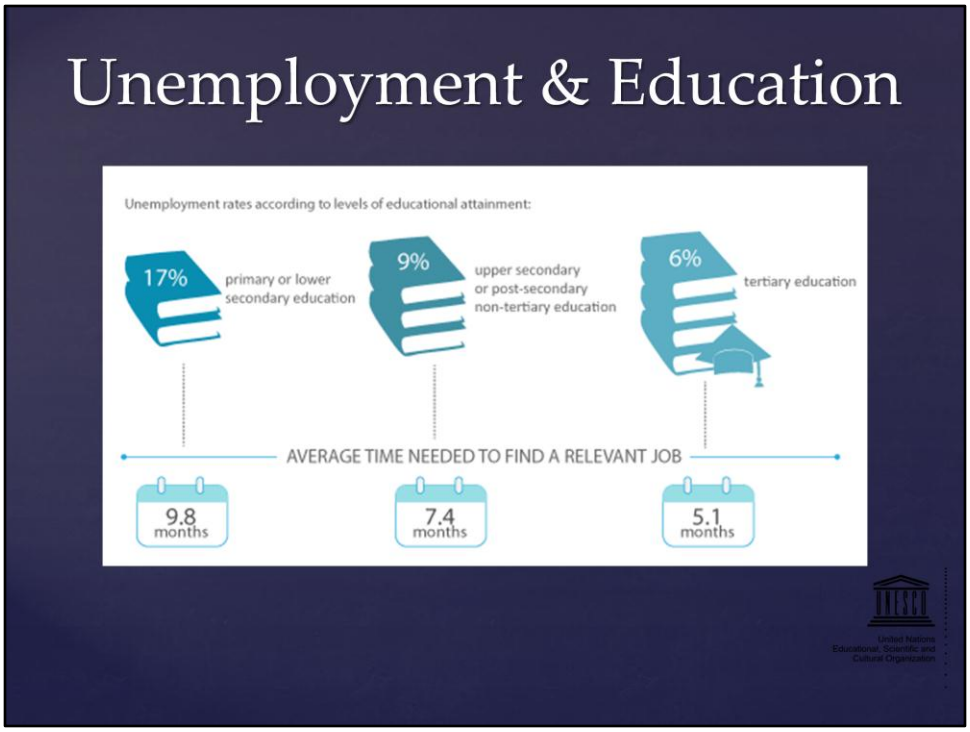


I was asked to speak about how ICT will intersect with youth now and in the future. In my view, no place is this more relevant than in the education sector.

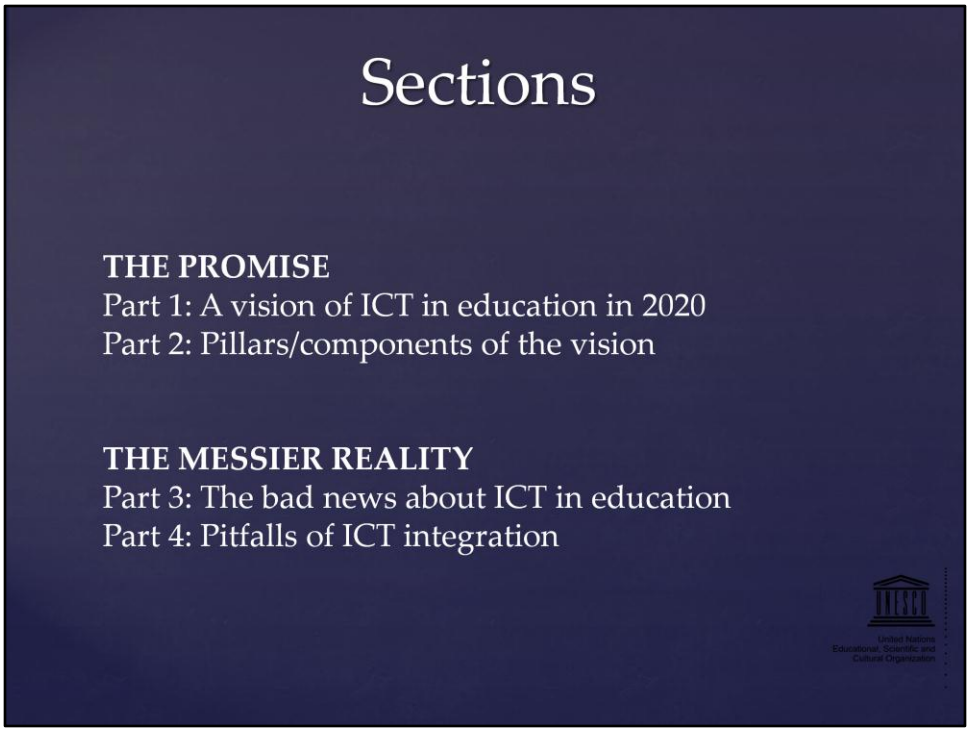
There is a growing consensus that technology is finally slated to transform centuries-old education paradigms. The stakes could not be higher. Across the EU, youth unemployment, as everyone in this room is keenly aware, is at a crisis level. It is, said candidly, inexcusable that one in four young people on the continent can't find work.

We know that education can help.



This slide aggregates data collected from the 34 countries that belong to the OECD.

The take away is unambiguous: More and better education helps people find work. So when we talk about improving education through technology, we are also talking about alleviating the unemployment crisis. The actions we take now in the education sector will play out over decades in the world of work.



My presentation today has two main parts.

In part one I will put on my techno-evangelist hat and paint an, admittedly utopian, vision of ICT integration in education. I will then dissect the constituent parts of this vision. For the policy makers in the room this will, I hope, help you better access and evaluate ICT in education initiatives.

In part two I will change into a more techno-skeptic hat and describe mistakes that governments and others make when trying to leverage technology for education. Hopefully this will help our resident policy makers avoid these same mistakes and realize (or come closer to realizing) the utopian vision presented in part one.

BEFORE VIDEO: I like the video I'm about to play because it attempts to SHOW the future of ICT use in education, rather than merely theorize about it. The film was, I must confess, created by Intel. I generally go to great lengths not to brand my presentations, but I know of no other resource—video or otherwise—that offers such a sharp vision of the future. Without further ado, let's take a trip to 2020…

AFTER VIDEO: I know the film can provoke strong reactions, but for the time being let's take it at face value. Let's agree that such a future is possible and desirable.

What I want to do now is unpack it. What makes the vision so rosy? How, exactly, is

technology transforming education? What separates the idealized school of the future from the schools we have in Europe today? I've identified eight components…

The Promise: ICT in Education

The first is personalized learning.

Think of how teaching works today. We lose kids who are falling behind because the coursework is too hard. And we bore the kids who are ahead of their peers. We teach smack in the middle.

This isn't the whole story of course: The best teachers try to differentiate their instruction, to challenge each individual student while, simultaneously, not overwhelming him or her. This is tough to do for one person, now try doing it for 35 and you see just how difficult this process is in practice.

Technology—of the type we already have—will make differentiation infinitely easier. Smart software can determine a student's reading level and then give them level-appropriate text. Experiments are underway to get deep insights into how well or poorly students are reading by tracking their eye movements. Think now of a future where every student is reading text that is just hard enough. Every student is growing, all the time. If there is anything that should excite you about educational technology, this is it. Personalized learning is the holy grail of teaching.

We know that learning happens in many places, but formal learning tends to be isolated to the four walls of classrooms. Students do not have sufficient opportunities to extend what they learn in school to contexts outside of school. We can do so much more to bridge-school and out-of-school learning and keep parents informed about what their children are studying.

Think about it for a minute, those of you who are parents… what are your students reading right now in their literature class? What scientific concept are they unpacking? What history are they diving into? You don't know, right??… Why not? We have the technology to make this possible tomorrow.

OPTIONAL: A great deal of evidence collected at UNESCO and elsewhere shows that students who have to commute long distances to school are at a disadvantage. They have less time to study. Students who have to care for siblings are also at a disadvantage. Why haven't we empowered them with tools that allow them to learn anywhere it's convenient, regardless of geographic location and regardless of time?

We've been using assessment wrong for years. We use tests for one reason: To rank and sort, reward and push: congratulations "you're smart"; "you're dumb"; "you failed." It's why students hate tests; they know we're judging—not helping—them.

All the time schools give tests and don't get information about student performance for months (in the US it can be over a year). It's insane and it does almost nothing to inform the intellectual growth of students.

The more feedback students get, the better. The faster they get it, the better. Technology makes this possible.

Working with students in classrooms is all well and good, but that's an awfully small group in our connected world. People with similar interests and aptitudes have found each other online without any assistance from the education sector. But a lot of students have not. Schools and teachers can help students find the intellectual communities that fuel and sustain learning.

Please excuse the plug… but does anyone here use Rosetta Stone? It's amazing. I turn on my tablet while eating breakfast and complete a few short lessons. Then on my ride to work I finish the unit I started in the morning on my mobile phone. At lunch I begin the next unit on my desktop computer. My device doesn't matter one bit. Everything is synched in the cloud.

OPTIONAL: It's worth acknowledging the incredible implications of carrying a device with you at all times. Cognitive scientists have figured out that human forgetting follows certain patterns. You forget things at regular intervals. The ideal time to review something you want to remember—to transfer from short term to long term memory—is the instant you're about to forget it. Study it too early, it's a waste of time; you're reviewing what you already know. Study it too late; you have to rewrite it into short term memory. So… you guessed it… educators and scientists have developed applications that tell you when to study, when it is most advantageous. (Humor) If a world where your phone buzzing to tell you to study Chinese vocabulary doesn't sound to good… well… you can always turn the thing off, but don't feel upset when all the technology enthusiasts are speaking Mandarin.

Did the teacher in that video look like a guy who graduated in the lowest third of his university class? Does he look like someone who is going to work for a salary that is just above the poverty line? Not at all.

This educator is a bona fide professional. He is deeply knowledgeable not only about his discipline but about theories of how to teach it. He has completed extensive and rigorous teacher training.

Oct. 5 is World Teachers Day and if you leave with only one message today it is that technology is going to demand MORE from our teachers, not less. If we want to build a better education system it will start with finally giving teachers the training, the salary, and the professional respect they deserve.

Presently, we waste class time. It's a valuable commodity. Think of the effort required to assemble all those young people in the same place, at the same time. Buses, buildings, air conditioning, water, cafeterias… the list goes on and on. And then what do we do? We talk at them. We do the exact same thing they could see online… only we do it worse.

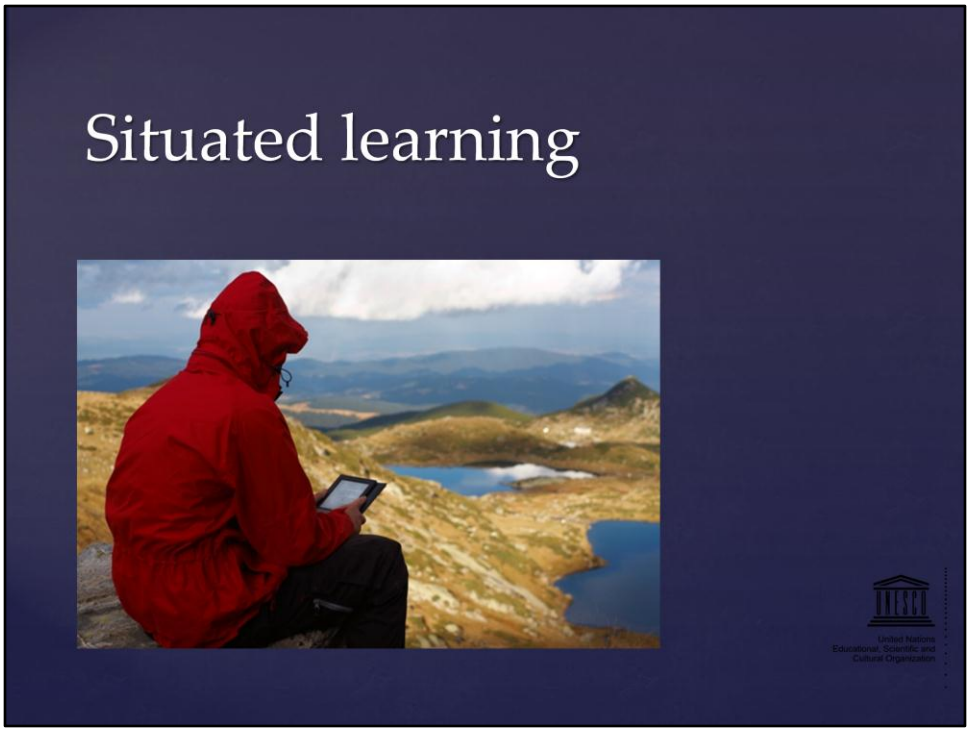
We've known for millennia that students learn best by doing. Confucius said:"*Tell me*, and I *will forget*. Show me, and I may remember. Involve me, and I will understand." Why are we still doing it wrong?

The flipped classroom is the way forward. Students learn rote content at home and then apply knowledge creatively in school.

Educators should not disseminate information… they should be managing and facilitating the complex tasks that make learning meaningful, authentic, and exciting.

I work for UNESCO and we think technology holds great promise not only right here in Europe but around the world. I want to briefly note some of the remarkable things ICT can do that the video didn't touch on.

Today a student with a mobile broadband connection in—you name it, Ethiopia, Afghanistan, India, Paraguay—can take a full course from a Stanford professor, complete assignments, get feedback on them, and carry on discussions with fellow classmates… all for FREE. People in the developing world have lacked real educational opportunities for decade. That is changing. We can cultivate talent from all over the world. Don't be surprised if the next great theoretical physicist or the next great play-write comes from Africa or the Middle East.



Classrooms are great… but we all know that learning, and sometimes the most meaningful learning happens outside them. Technology can help power this learning. I've seen demonstrations of educational applications that allow you to hold your smart phone at a physical structure (a particular bridge or famous building) and see it's insides or time-elapsed video of its construction. Geo-tagging and better image recognition are going to turn the whole world into a classroom.

You see the guy in the picture here. He's not reading the newest Stephen King novel. He might very well be learning the names of the lakes and peaks near his home. Or he might be taking an picture of a certain type of moss which his tablet recognize and then tell him the genus and species name of the moss, whether it is edible, where else in the world it goes, and… well… everything a person might want to know about moss. The possibilities of situated learning are exciting and they depend, fundamentally, on technology.

We've all been reading about Syria. UNHCR tells us the civil war in that country has already displaced approximately 2 million people. The conflict is robbing young people of their education.

In the past it was hard to extend educational opportunities to refugees. It still is hard, but technology makes it easier.

I work with a team that is developing a plan to use working mobile phone networks to extend education to Syrian refugees who are slated to attend schools in Kurdistan. Why a mobile network? 1) They work well and even when they're malfunctioning, they are easier to replace than brick-and-mortar structures; 2) Many Syrians have working mobile devices so they have a portal to content; what they certainly do not have are physical books; 3) mobile phones allow UNESCO and other organizations to reach students who are unable to attend school. We can, in effect, reach the unreachable.

We host a conference every year at UNESCO about the educational applications of mobile technology. Last year a professor from Harvard came. He is severely dyslectic and he noticed that when he read on his mobile phone it was much easier than reading paper-and-ink text. He started some experiments and discovered that by simply making text appear so there are numerous line breaks many people who suffer from dyslexia can read with greater comprehension.

Already technology is helping the physically impaired: a 100 USD Kindle can now read written text aloud. Futuristic devices are being tested that translate written text into Braille.

Technology can and will help people with disabilities excel academically and creatively.

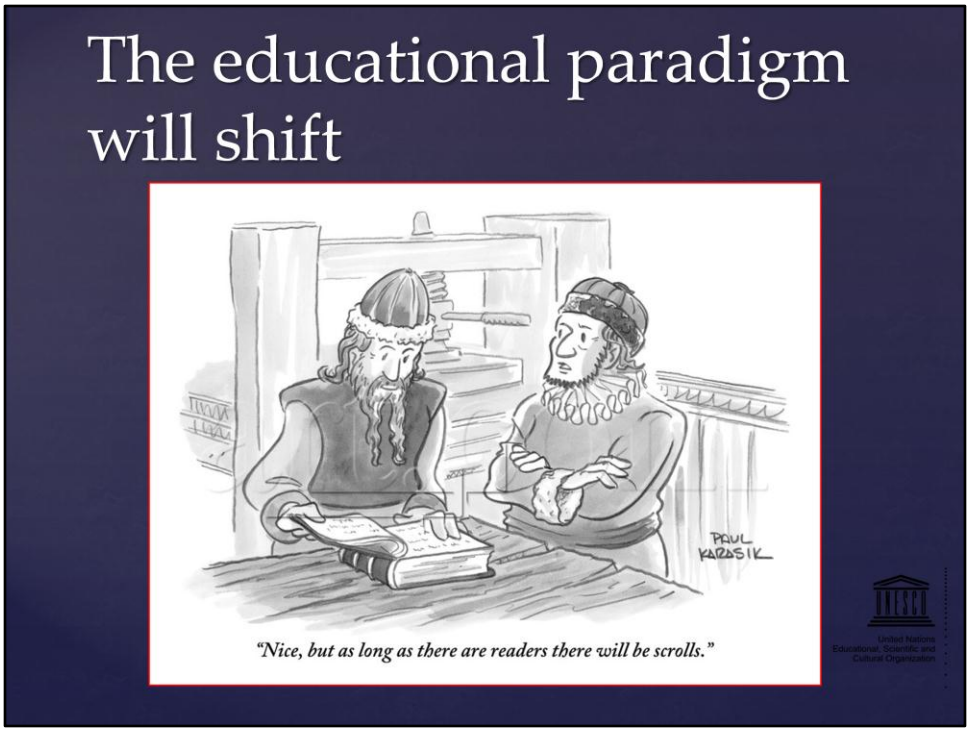
You've all heard about Big Data. Well big data is coming to a school near you.

In the past educators and education researchers have not had enough data. By the time 2020 rolls around, we're going to have more than we know what to do with. We're going to have to figure out what data is meaningful, what is not, where correlations exist, what triggers causation.

We're going to have more information about what works and doesn't work in schooling. Does it help that students have the same teacher for more than one year? What is the right amount of assessment? What can individual schools teach each other? Innovations will come from everywhere and we will have data to better—if still imperfectly—assess their impact on teaching and learning.

Not only can we do all of what I just described with the effective integration of technology, we can do it for less money. That's right. Goodbye text books with their astronomical price tags and distribution costs. Hello e-readers, automatic updates, dynamic content, and content tailored for individual learners.

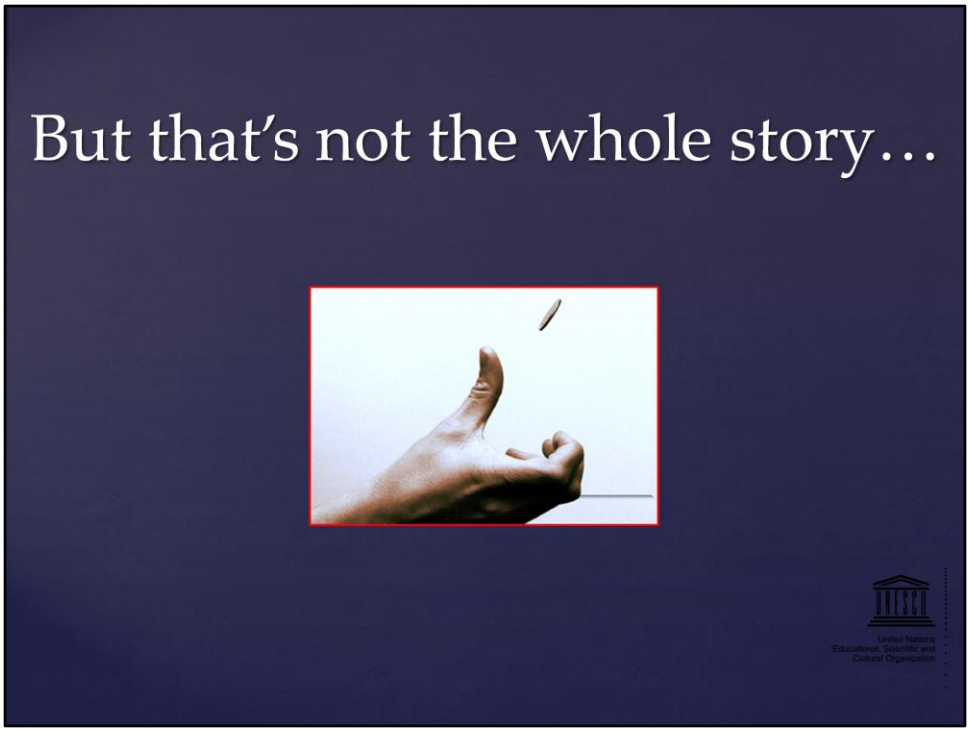
Technology has a way of allowing us to do more with less money. I imagine the same will hold true in the education section.



So to wrap up… we've seen the vision… and education is about to be disrupted and improved by technology.

While you are wise to be suspicious of anyone telling you: "This time is different. Change really is just around the corner." TRUST ME. This time really IS different.

For those doubters in the room… remind me not to remind you how much you say you love paper-and-ink books in five years. These artifacts, like other traditional pillars of traditional education, are going the way of scrolls.



Every coin has two sides…

Okay… time to changes gears and talk about the less utopian side of ICT in education.

Unfortunately, for the most part we are not—at least not right now—moving toward the rosy future portrayed in the video. Arguably, we are moving in the opposite direction.

Many of us recognize intuitively that technology is not a panacea…. and, indeed, it may be exactly the opposite. We may just being sold a bill of goods by technology companies. The track record on technology integration in education is dismal. The central conclusion is generally that it's a catastrophic waste of money.

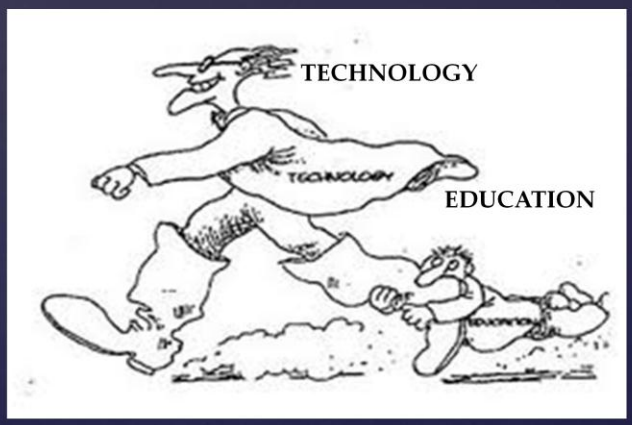
I could easily dedicate an entire 30 minute presentation to presenting an argument that technology is gutting education and undermining learning, But, in my heart of hearts, I think technology can transform education for the better, so for the purposes of this presentation I wish to remain cautiously optimistic.

But optimism does not require putting our heads in the sand.

In the spirit of caution optimism I want to want to identify five mistakes we make again and again when trying to integrate technology in education.

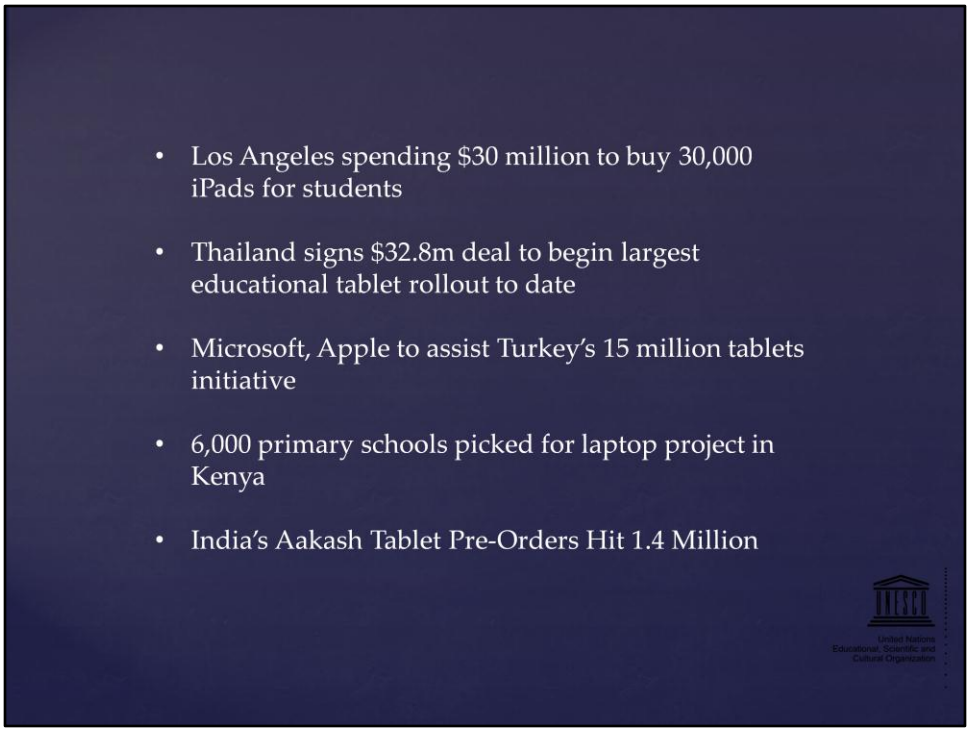
Mistake #1

Technology is treated as an "ENDS" not a "MEANS."



John Dewey famously said: "The educational process has no end beyond itself; it is its own end." The same cannot be said of technology. In education it must be a means, nothing more.

Politicians and the public erroneously believe that the mere presence of technology in schools is a sign of progress.

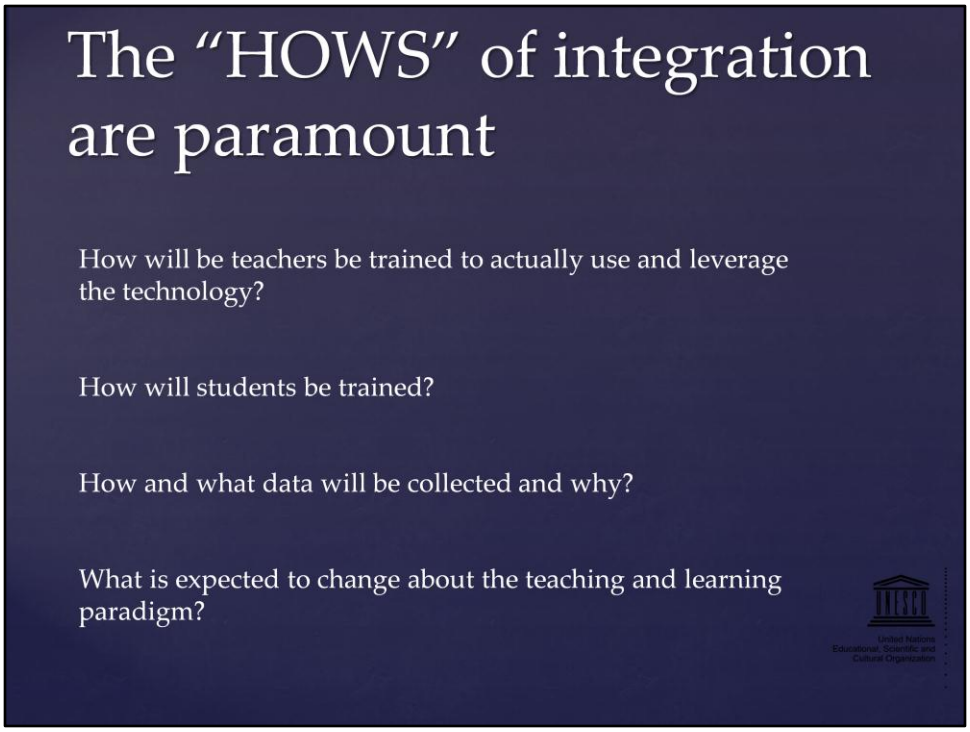


If you don't believe me here's a roundup of recent headlines.

And let me be clear, I'm not saying these initiatives will fail; I hope they all succeed.

But in my tenure at UNESCO I've have noticed a dangerous trend of politicians promising to buy all students a flashy new technology ("iPads for all!") and finding enthusiastic audiences... and votes.

At UNESCO we meet with many people from education ministries who come to us saying, "My boss said we need to purchase laptops/tablets for students and, to be totally honest, we have no idea how to make this thing work."



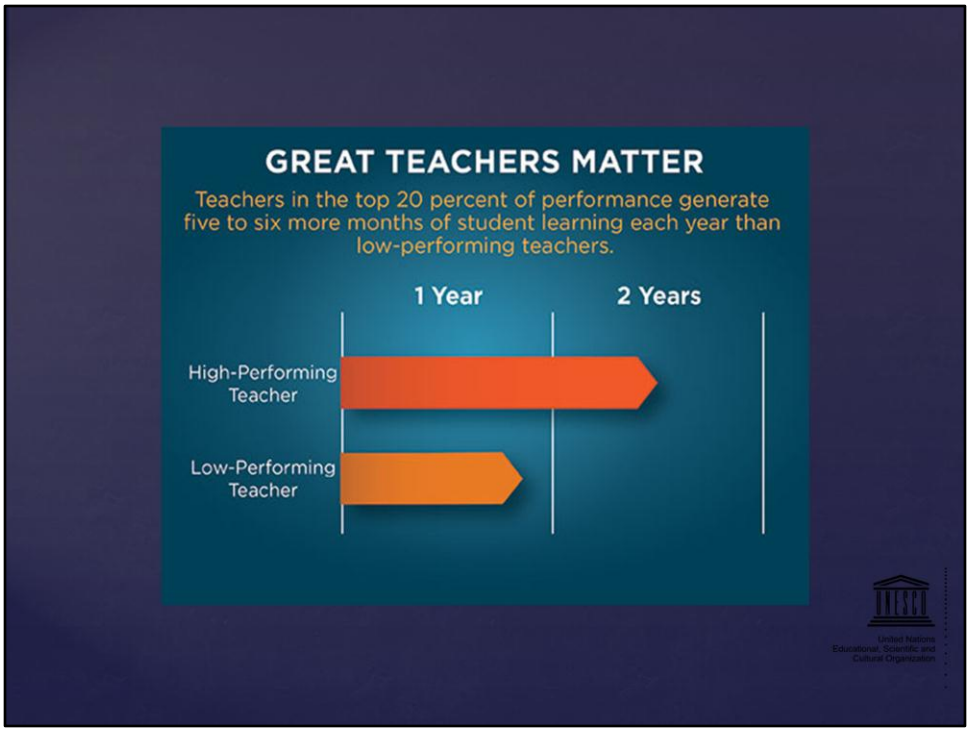
Planning is vital

1) Investments in teacher training should, as a general rule, exceed the amount spent on the technology itself. If teachers aren't on board the initiative will never take off.
2) Students may be digital natives, but they need help just like the rest of us learning to use new technology for educative purposes. Some of their technology habits will need to change as well. No more flicking through screens every 10 seconds. They will need to get used to using technology to do things that are challenging and probably a bit uncomfortable at first. They will have to get accustomed to assessments that aren't their to reward or punish but simply to help prompt growth. In may ways the changes students make will be as serious as those made by teachers.
3) Not all data is useful. Policy makers need to be judicious about what they collect and how it will be used productively.
4) If teachers and students are not shown what they are supposed to do with technology they will, as the saying goes, use new tools in old ways. Principals and others must for example insist that parents are informed about new topics of inquiry if this is to really gain traction. The education sector will need leaders with vision.

Mistake #2

Technology is used to replace rather than empower teachers.

The second mistake is using technology to undermine teachers and dictate, exactly, how they should do a job that is far too complicated for top-down bureaucratic prescriptions.

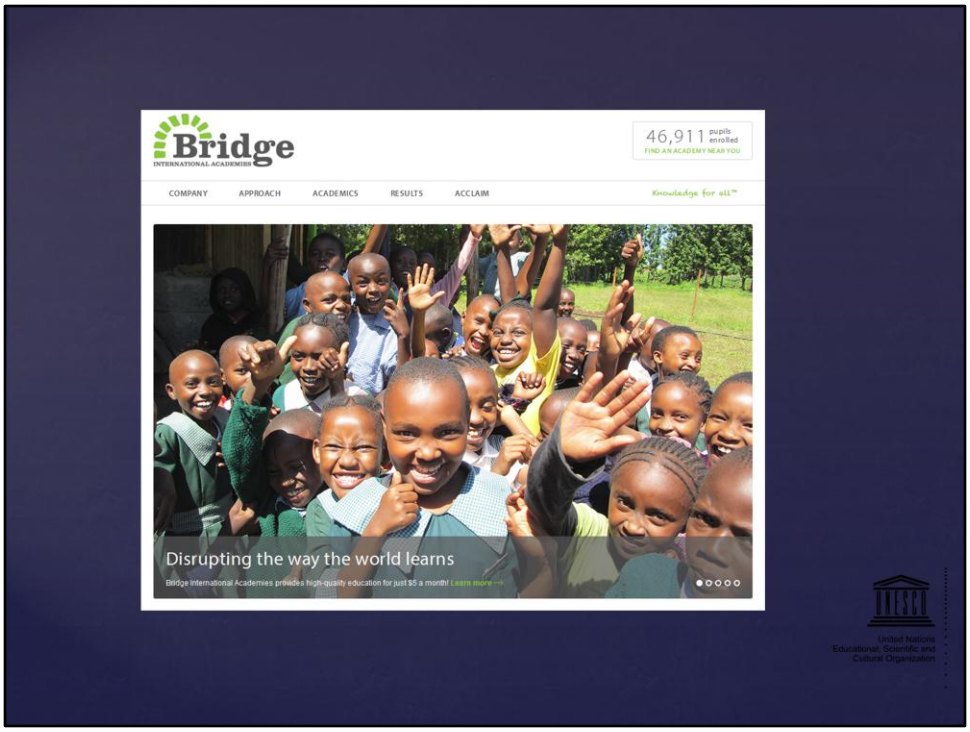


To my eye one of the most compelling objections to technology rollouts in education is that the money would be better spent recruiting and training skilled teachers.

But I don't think it needs to be an "either/or" choice. My hope is that it can be a "both/and" decision.

We know that teachers matter more to student achievement than any other aspect of schooling. Let me repeat that "Teachers matter more to student achievement than class size, class time, the presence or absence of technology, and the organization of the schools and classes."

From this, my hope is that as more and more technology reaches schools, we use it as a chance to increase their status and perhaps pay them more money. Integrating powerful learning technologies in classrooms is not a simple task and we will need skilled professionals to lead the charge.



The final slide on this point is intended to serve as a warning…

The company webpage pictured here is from Bridge International. It is a for-profit company with a big footprint in Kenya that is reducing teaching into script-reading. They have scaled education so that every instructor teaching, say, biology is not only reading from the same script and writing the same words on a chalk board, they are doing it at the EXACT same time: it is a literal assemble line of learning.

One of the company's slogans is "standardized yet customized" which sounds like something of a euphemism. (I should note here, however, that while I think Bridge International is setting a dangerous precedent, it is working in contexts that are very different than the EU, and some elements of the company's approach deserve a closer look… it's not quite as simplistic as I let on.)

But the marco-point should be unmistakable: Technology demands even better teachers, not technicians who babysit kids while they thumb at touch screens in cubicles. Policy makers must ensure that technology is not hoisted onto education in such a way that it undermines the professionalism in teaching.

Mistake #3

Technology is used in isolation, removed from the social interactions that fuel learning.

United Nations Educational, Scientific and Cultural Organization

This point is best explained visually.


feel
her
house
fly
feel
friends
family
money
mouse
Mrs.
nice
need
paint
pretty
paper
people
please
play
Qq
Rr
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roam
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rain
Ss
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some
soon
said
says
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thank
time
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It's this…


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Educational, Scientific and
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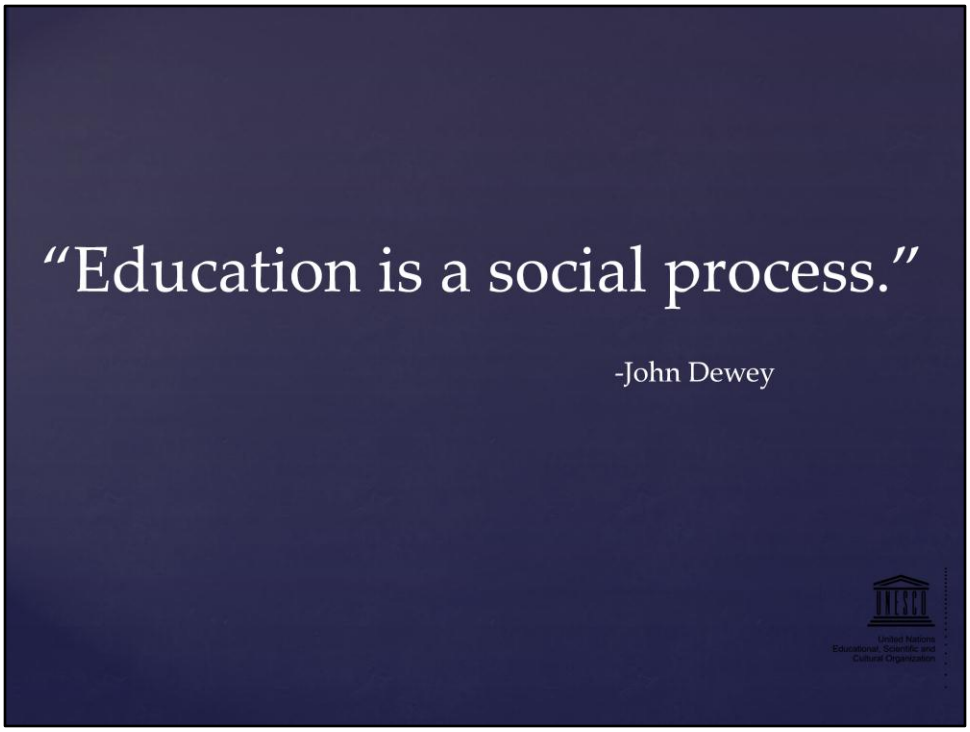
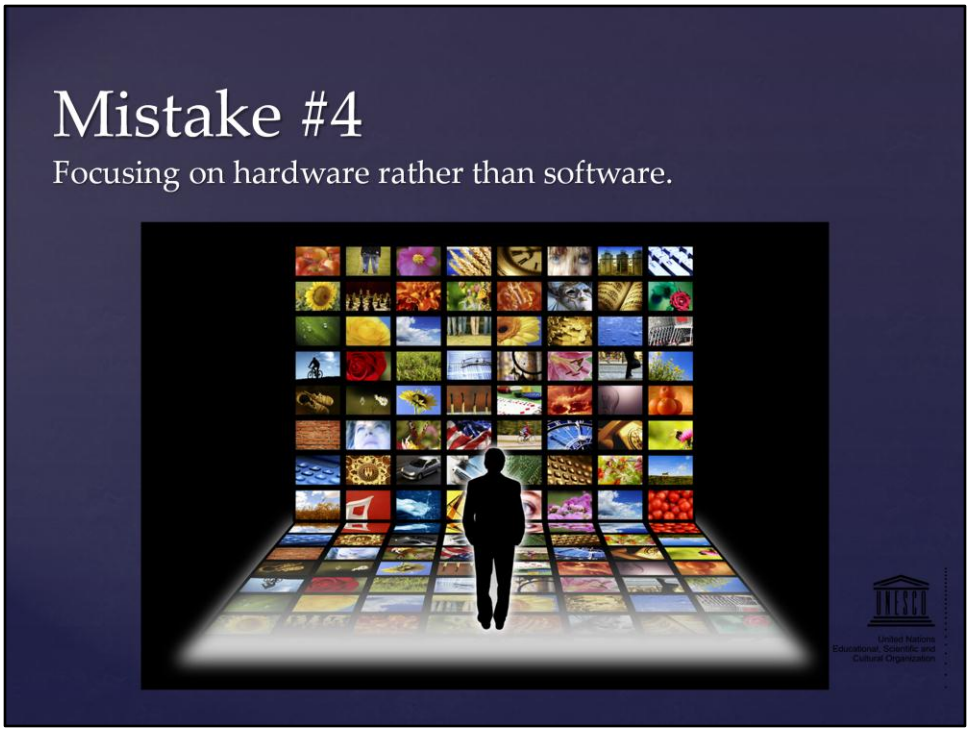
Not this.



Technology needs to make for better and richer human interaction. Dewey's point about the importance of social interaction gets repeated by just about every great educational thinkers of the modern era: from Piaget to Vygotsky… education is social.

I want to stress that while face-to-face interaction seems to be especially rich and perhaps uniquely well-suited for learning, this is not to say that digital interaction is not also meaningful.

Conversations about technology integration generally take it as an article of faith these days that all students will and should use individual device. I see value in this model, but I also see a place for what is happening in the top picture of this slide.



And now mistake number four.

We all love the perennial debates: Apple or PC? Samsung or Nokia? Sony or Motorola? We're diverting our attention from the crucial task: that is, selecting the educational software and tools that will be used in and out of schools.

While I often wear a techno-evangelist hat, a lot of educational software is underwhelming (and, frankly, a lot of what does exist doesn't work that well just yet).

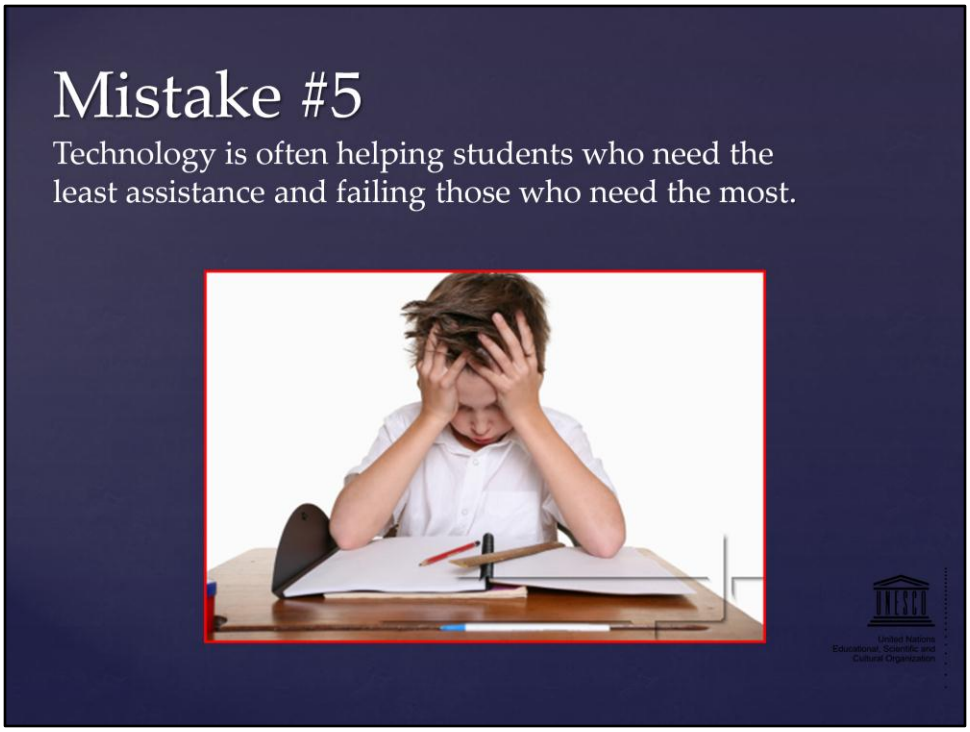
Take the Khan Academy for instance… by and large it's a digital library of lectures given with colored pens against a black background. It rarely employs interactive or dynamic features. It is people talking at you. Also the library of 2,400 videos can be overwhelming. Good curriculum should help students map their learning trajectory. Ultimately the Khan Academy is not so much a new way of teaching as a very old way of teaching moved to a digital environment.

When you really get right down to it, a lot of the education content available is no better or worse than the Great Courses. It was just VHS tapes of lectures delivered by famous academics. My Dad was a fan. I prefer them to most of the Khan Academy videos. (Does anyone remember this? Their catalogue was a staple of junk mail in the US through the 1990s.)

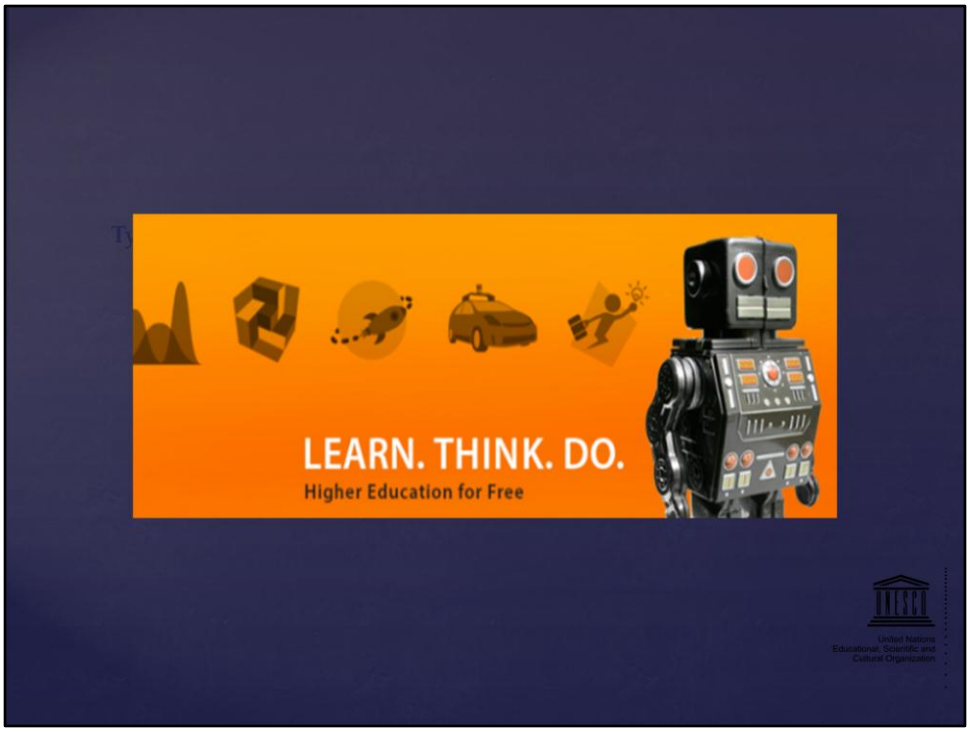
We also know that even if every kid has state-of-the-art technology that doesn't automatically mean learning is occurring. I've seen a lot of terrible content that does almost nothing to cultivate higher order thinking skills and instead promotes the rote memorization of facts.

In my view, great digital content won't always be free.

I was involved with team at Stanford University that built a website to facilitate teaching and learning in history. This was no small endeavor. It took a multimillion dollar grant, a bunch of talented scholars and graduate students, and a team of techies and designers. But the result is impressive. It's a model of what is possible in the digital environment and teachers all over the US use it.

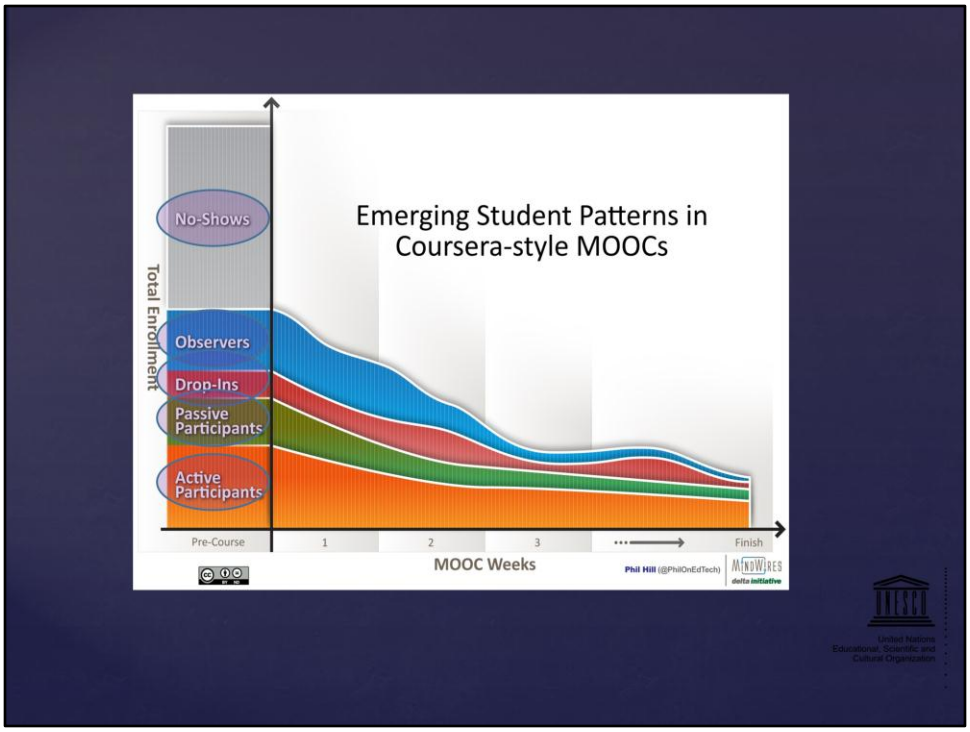


When you evaluate ICT initiatives though this lens you see a lot of failure. It's remarkable how easy it is to help young people who are skilled at helping themselves and how difficult it is to help those who aren't.



This is an image of the Udacity logo. And Udacity, in case you haven't been reading a newspaper for the past year, is a MOOC provider. MOOC stands for Massive Open Online Course. They're not new. Open University in the UK has been doing large online courses for years as have other institutions. But because Harvard and MIT and other storied universities are throwing money at MOOCs they are the rage in America.

Also, Coursera and EdX. Open University in the UK has been doing the same thing for well over a decade.



Despite the hype, MOOCs boast completion rates of—brace yourself—six percent. If any university was posting those numbers it would lose public funding.

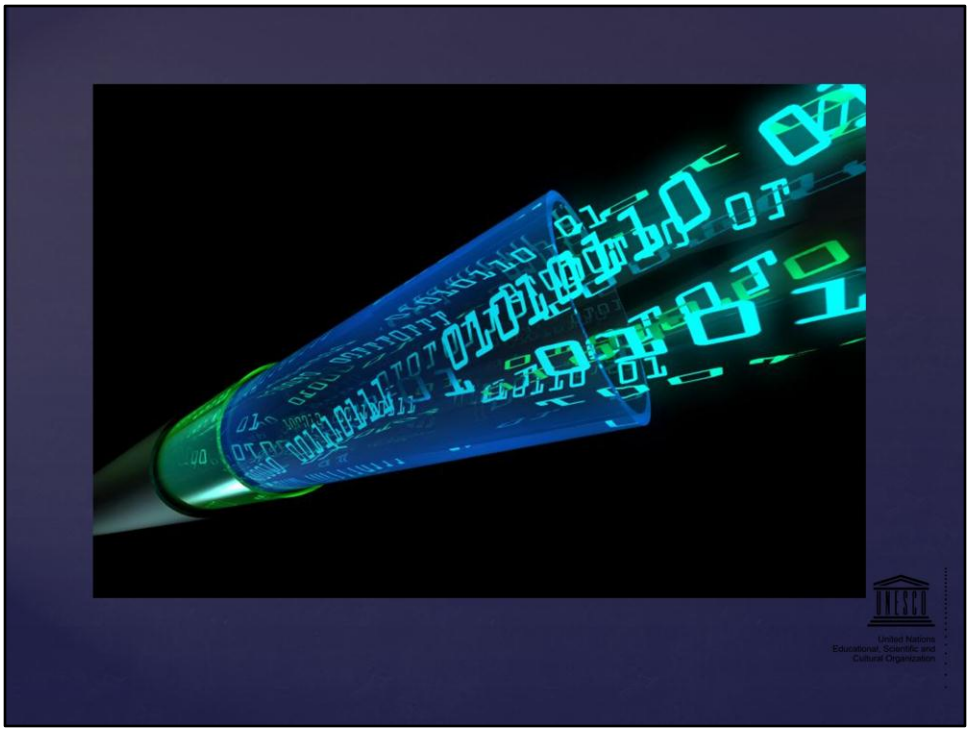
So whose taking these courses? (Ignore for now the labels on the chart itself.)

1) Well these are the people who don't speak English or don't have a reliable internet connection
2) These are the people who didn't understand the first lecture because they lacked background knowledge and basic academic skills
3) These are the people who discovered they didn't have sufficient time to take the course. Work and life got in the way.
4) These are the people who had questions they couldn't get answered and eventually gave up.
5) And these are the people with MA and PhD degrees in the subject being elaborated by the course

Early data shows that you are likely to finish a MOOC if you are a graduate student or holder of a graduate degree. MOOCs may be the start of something big, but right now they are hardly solving our most pressing education challenges.

Many close observers of educational technology say that we are in our SIXTH so-called transformative moment.

1st there was radio
Then TV
Then the PC
Followed by the laptop
Followed by equally powerful, yet highly mobile devices
And throughout it all we've spent a massive amount of money and not much at all to show for it; students don't seem to be doing much better with technology than with out it.



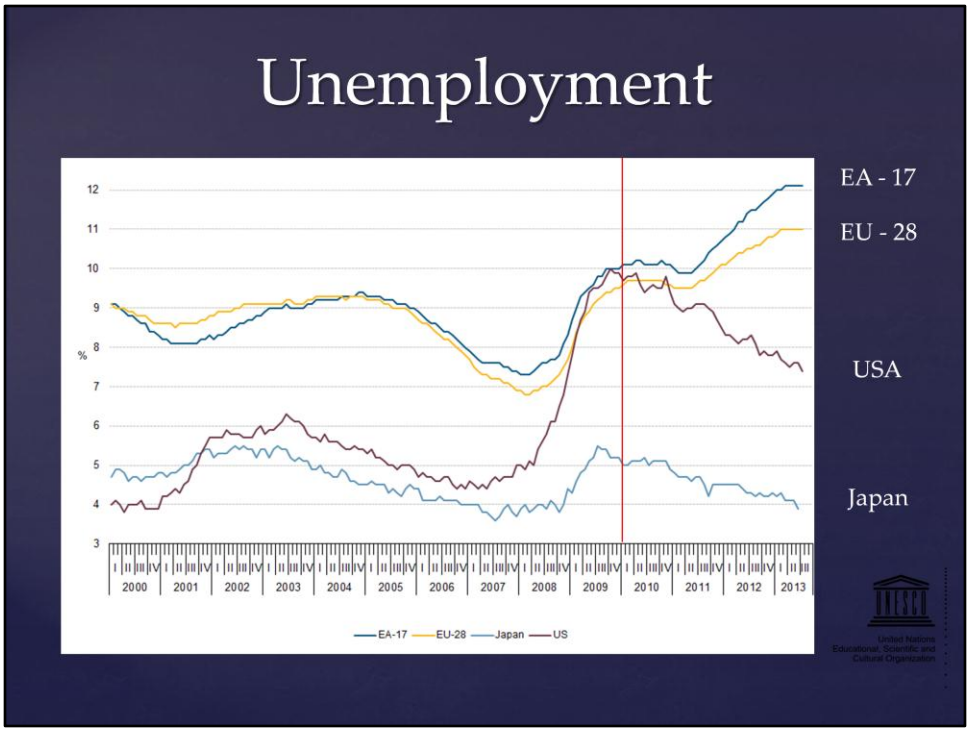
But I want to end on a hopeful note. I really do think the idealized future we saw in the video is possible. The technology is here. It exists today. It is up to us to implement. And if we do it right…

Voilà… a better education for Europe and, with luck, the rest of the world as well.
Thank you very much.

Voilà… and, yes, better education for Europe and, with luck, the rest of the world as well. Thank you very much.


United Nations
Educational, Scientific and
Cultural Organization


United Nations
Educational, Scientific and
Cultural Organization



IF EXTRA TIME:

I want to look with open eyes at the unemployment crisis here in Europe.
Today unemployment in the 17 country Euro Area is hovering around 12%
The EU is not far behind at 11%
And unemployment is much higher than that which exists in the US and Japan, the bottom two lines.

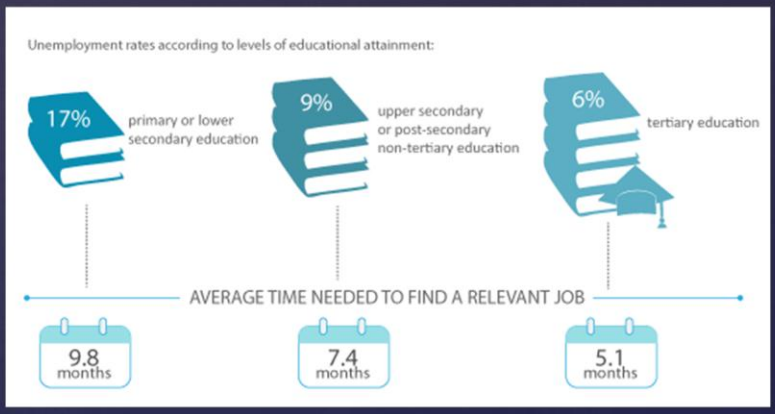
More startling though, is the lack of recovery.
The red line there shows unemployment in Jan. 2010. As you can see both the US and Japan have recovered significantly, while the unemployment in Europe has grown more severe.

IF EXTRA TIME:

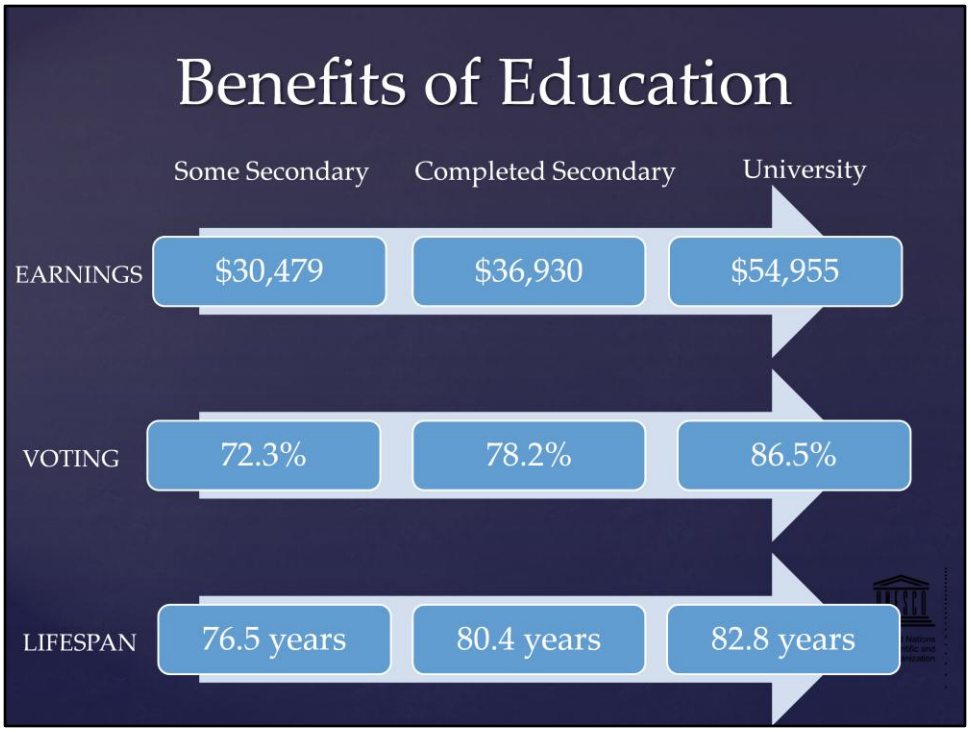
Young Europeans have lived all their lives in times of mass youth unemployment. Young adult unemployment did not fall greatly during the boom years. In 2013, those officially labelled as unemployed account for almost a quarter of all people aged under 25 across the European Union**. This quarter is just those who are eligible to work and unable to find any work; it does not include all those other young people who would work if there were work.**

Source: http://www.newstatesman.com/2013/08/generation-jobless

Unemployment & Education



IF EXTRA TIME:



IF EXTRA TIME:

Source: OECD, Oct. 2012

http://www.thedailyaztec.com/2012/10/education-is-a-priviledge-vital-for-a-successful-life/new-oecd-report-details-benefits-of-higher-education/