

Recoding The Classroom

Though our world is changing, the spaces in which we teach are stuck in a time warp. According to some forward-thinking experts, only by embracing new technology and ideas can twenty-first-century schooling stay up to speed with the kids.

WORDS BY *Andrea Kurland* | ILLUSTRATIONS BY *Oliver Jeffers*

For nearly two centuries, schools have been tasked with turning underage citizens into a singular workforce capable of tackling, and molding, tomorrow's world. But here's the thing: If the world we live in looks nothing like it did three decades ago, and even less like it will three decades hence, is it right that the classroom of today would be instantly recognizable to your mother, your mother's mother, or your constantly networking, cell phone-obsessed daughter?

It's hardly revolutionary to say we're living through revolutionary times. How we work, communicate, live, and learn has been transformed by the information age spawned by the internet.

But while we intuitively weave new tools into our everyday lives – blogging, tweeting, texting, and using Google as if by instinct – inside high-school walls, it's like they don't exist.

Thankfully, kids are a resourceful bunch. When it comes to knowledge that matters in the real world, they know that most answers are simply a collaborative click away, existing as they do in the open, participatory spaces that we all inhabit online. But isn't it about time our classrooms caught up and started moving at web speed?

Faced with a complex future, some educational thinkers aren't afraid to accept that in order to move forward we need to dissect the old system and erect a new vision in its place. These key lessons can help pave the way. ➡

LESSON ONE

The WORLD is CHANGING -
Jump ABOARD WHILE YOU CAN.

Professor Cathy Davidson knows how to handle change. Speaking from her office at Duke University, where her classes include 'This Is Your Brain on the Internet,' she's blasting through the information ages that have transformed our world – from the invention of writing in ancient Mesopotamia, to Tim Berners-Lee's World Wide Web. "Almost everything we know about school was designed for the late eighteenth century, when the invention of steam-powered presses made books available to common people," she explains. "Partly, it was about social control; how you take this massive group of people that are becoming literate and educate them for the industrial workplace. [Now] here we are, in this fourth information age where everybody can broadcast themselves, and we're still working with a top-down, hierarchical system."

In her book, *Now You See It*, Davidson explores how our brains have adapted to the digital age, despite our long-standing anxiety about the speed of information. 'Early critics of the car, for example, simply refused to believe they could be safe because, after all, human attention and reflexes were not created to handle so much information flying past the windshield,' she writes. Yet our brain is not static – it adjusts and adapts and ensures we keep up.

So concerns that seem rational today often appear ludicrous tomorrow. "People say crazy stuff about how the internet is ruining attention and young people's memory," says Davidson. "But only five percent of the brain's energy is used when we switch from one task to another, whereas when you focus in a specific way, which is what the traditional education model thinks attention *should* be, you're actually excluding everything else."

This disconnect between the mediocre brain we *think* we have, and the astonishingly adaptable one embedded in our skull, has kept our education system tethered to an outdated archetype.

In her book, Davidson calls it the 'assembly line' model that both 'offers uniformity and suffers from it.' Its cornerstones are standardized grading and curricula that stifle creativity. 'Everything about school and work in the twentieth century was designed to create and reinforce separate subjects, separate cultures, separate grades, separate functions, separate spaces for personal life, work, private life, public life, and all the other divisions,' writes Davidson. 'Then the internet came along.'

As she explains today: "We've spent the last 100 years teaching ourselves how to have a kind of individual, task-oriented, specialized attention. Now we're living in a world whose wonders are based on collaborative, open, contributive, iterative, group interactive, contradictory, conscious, constantly evolving thinking."

It's a world that requires new approaches – ones that get away from monolithic teaching practices and embrace a student-centric philosophy. And it's already happening. Khan Academy, an online 'school' hosted on YouTube that combines 2,500-plus tutorial videos with exercises and real-time data on student performance, has been working with Los Altos School District to embed their resources into the school day. Far from dehumanizing learning, the idea is to 'flip the classroom.' With ➡





teachers assigning videos as homework, and working on problems with smaller groups during class, students are able to progress at their own pace.

So, is it a case of adapt or die? "I actually don't think you need to put one penny of tech into the classroom in order to do a far better job of teaching kids how to think for this era," says Davidson. "Every child should be learning code, even if it's just to know how the system works. They should learn how to work collaboratively, how to work in groups, and manage a project. All of those intense skills are similar to the world of learning kids experience online." ➡

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Quantify: Speed

Today, 60 percent of all YouTube videos go live in under one minute – a year ago, no videos were being processed that quickly.¹³

LESSON TWO

LOOSEN the REINS; LEARN FROM the WEB

Whenever Professor Sugata Mitra unveils his latest findings, traditional educationalists start quaking in their boots. For proponents of repeat-after-me learning, the words 'Minimally Invasive Education' (MIE) are not welcome. But then, revolutions seldom are.

In 1999, Mitra set up an experiment that would subvert the principle of hierarchical expertise underpinning education – that for one person to learn, another must teach. While working for global education company NIIT, he installed a computer in a wall in Kalkaji, New Delhi. He discovered that, when left unsupervised, children from the surrounding slums could learn to use it by themselves.

"It isn't unbelievable now," says Mitra. "But we have to throw our minds back to 1999; people used to think that computers needed to be *taught* to children. I thought that might not be the case." Having proven his hypothesis, Mitra rolled out more 'Hole in the Wall' experiments across India, Cambodia, and Africa. Each one delivered the same surprise. "We had stumbled on some kind of universal learning mechanism. Naturally, a second question arose: If children can teach themselves to use a computer, what else can they teach themselves? And that led to a whole set of experiments, which is currently saying, quite unbelievably, that groups of children given an internet-connected computer can teach themselves almost *anything*."

Things hit a crescendo when Mitra set a group of Tamil-speaking village children the 'impossible' task of learning the biotechnology of DNA replication – from English material, without a teacher. "In three months they were up to speed with my control group at a posh school in New Delhi," says Mitra. "My next question is: Can children learn to *read* by themselves? It's a short little question, but one that will turn education on its head if the answer is yes. If a child can teach

himself to read and then he's exposed to the internet, does he need anything else?"

After 12 years of experiments, Mitra has turned the theories underpinning MIE into physical spaces – pods, known as SOLEs (Self-Organized Learning Environments), in which groups of children search the internet unsupervised. "The absence of a teacher can be a pedagogical tool," explains Mitra. "Before you start teaching anything, you give the learners a chance to see if they can do it by themselves. If they can, you move on. It's as simple as that."

Likewise, in Davidson's classes, the teacher is no longer the only expert in the room. "I'm using the principles of open web development," she explains. "Each week, two students are in charge of the class; they read what's on the syllabus and then decide whether they're going to teach that or choose something different. Everybody is guaranteed an 'A' if 10 assignments are judged satisfactory by their peers. It's a constant process of learning how to grow from one another's feedback, very much in the way that you learn from online social networking. You don't know who the conduit of information is, but you learn to trust people because they're good at passing on information. That's turning the education system inside out. That, to me, is the world we live in now." ➔



LESSON THREE

TECH IS A TOOL —
Until it becomes an
AGENT FOR CHANGE

“The phones students have in their pockets are often more powerful than the computers in school,” says Geoff Stead, Head of Innovation at education consultants Tribal. “Before banning them, just think: In any future job, would you expect to be able to contact people wherever they are? That’s the world we’re preparing our kids for, so it makes no sense to pretend that phones don’t exist. Our mantra is: Don’t use phones as a channel to push content; use them as a tool to engage and encourage learners to *do* things.”

Stead knows that mobile tech is enabling social change because he’s seen it first-hand. Through M-Ubuntu – an initiative that’s using inexpensive cell phones to introduce 600 South African students to project-based learning – and an app-based literacy program targeting McDonald’s employees, he’s helping disengaged learners to become re-engaged.

But it’s not just about empowering learners. Empowering teachers through tech is a mantra echoing through education’s halls. The Google Faculty Institute (GFI) is just one initiative targeting grassroots educators to get the revolution off the ground. “The aim is to affect deeper pedagogical change by collaborating with pre-service teachers and faculty members from the education departments of 19 California State Universities,” explains Maggie Johnson, Google’s Director of Education and University Relations. “The hope is that we can build a new breed of teachers who move into the system with a completely different way of thinking about technology.”

This summer, GFI gathered to discuss how technology could be used to transform the classroom from lecture hall to conversation space. But that was just the start. Ten grants

were awarded to projects worked on by a team of several Fellows, each designed to reach fruition in six to nine months. “One project I really like is a four-week curriculum to teach pre-service teachers how to program on an Android device using App Inventor – a tool that allows non-technical people to build mobile applications,” says Johnson. “One of my favorite things is that it’s scalable – it can be dropped into any educational technology class anywhere. Not only does it take the mystery out of technology, it also gives these new teachers a chance to get their students engaged.”

Finding ways to engage students has always been education’s holy grail, and for Ewan McIntosh it’s as critical as ever. Through NoTosh, the consultancy he founded to “cut the crap from creativity gurus,” he helps teachers adopt the principles of ‘design thinking’ that come naturally to tech start-ups.

By engaging students as problem-finders, not problem-solvers, says McIntosh, we can catalyze a wave of social change. “Teachers are beginning to realize that the old way, as well as not producing great examination results, is producing youngsters who simply don’t enjoy school,” he says. “A disengaged learner is more likely to become a disengaged citizen, and that’s far more costly than investing now in thinking about how we grab students’ attention. Nothing engages a person more than a project they came up with.”

Behind school gates and university walls, forward-thinking educators are turning insights like these into learning spaces that dovetail with the way we live and communicate in the twenty-first century. What the future looks like is still anyone’s guess. But as long as education keeps accelerating towards it, the generation that gets to experience it will have the skills to flourish.

“The final catalyst will be when teachers have students – 17- or 18-year-olds – who don’t know a ‘before,’” concludes Davidson. “Young people who say, ‘I don’t care what came before; this is the world I live in, this is the world you live in, so how can we make it work for us?’ Once you get past the ‘before’ and ‘after,’ you hold the world accountable in a different way, and you hold institutions accountable in a different way. I think that’s when change happens exponentially.” ©