

A radical approach to teaching Canadian students in the digital age

by KATE HAMMER • DEC. 5, 2011

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So he had his math classes at Okanagan Mission Secondary School in Kelowna, B.C., watch prerecorded video lessons from home – freeing up school time for one-on-one work.

Turns out pixelated teaching works well: His students' grades are up about 5 per cent.

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But that may not be enough. While Canadian schools have fared well in international rankings – fifth over all in reading, seventh in science and eighth in mathematics, according to the Organization for Economic Co-operation and Development – we're slipping. Over the last decade, our scores have plateaued while Korea and China have surged ahead.

How can we compete with countries like South Korea, which is arming every child with an iPad in a push for a paperless education system by 2015? Or when Australia is investing billions in a one-to-one ratio of students-to-computers at high schools?

The problem is that technology doesn't have a proven payoff. The Kyrene School District in Arizona, for example, invested \$33-million (U.S.) in various technologies. Its standardized test scores didn't budge, while the rest of the state posted gains.

What's needed isn't simply technology, but a radical shift in education for the digital age – the courage to address uncomfortable questions.

For example, when students can access information online, what's the value of a teacher at the front of a class? Instead of banning cellphones at school (for fear of distraction), should we be investing in, say, iPhone learning apps? Should we fight for boundaries between students and teachers, or encourage them to "friend" each other?

In his book *Disrupting Class*, Harvard business professor Clayton Christensen argues that schools have simply "crammed" new technology into existing structures. But to educate a digital generation goes beyond a patchwork of gadgets. What Mr. Christensen calls for is something more – pressing a kind of reset button on learning and our approach to technology at school, specifically one that moves away from teacher-led content delivery to an emphasis on personalized learning.

Take Mr. Johnson's unconventional approach, which is called a "flipped classroom."

It not only re-imagines how to teach kids – but when they learn and from whom. Instead of listening to a

teacher at the chalkboard and doing homework after school, flipped classes watch online lessons at home and work through assignments with teachers during school.

The idea is partly to offer the best possible lesson, and partly to tailor learning to students' individual needs. Online videos can be polished versions of what's usually presented from the front of a class, or allow teachers to essentially outsource lessons to better educators – those who've mastered the ultimate explanation of quadratic equations or photosynthesis. Teachers can then use freed-up school hours to coach students based on their individual strengths and weaknesses.

"Right now, we build minds the same way we build cars," says Shantanu Sinha, the COO of the Khan Academy in the U.S., which streams free online tutorials. "We treat everybody the same, and the reality is everybody is different."

The flipped classroom isn't without skeptics. There aren't yet comprehensive studies on their effectiveness, and tech trends in education can be more volatile than Apple's stock.

Some educators wonder whether it works for every discipline, or only for certain age groups. Access is an issue: Many people living in Northern communities can't tap into high-speed Internet (or get any Internet at all).

Paul Taillefer, president of the Canadian Teachers' Federation, is one educator sounding a note of caution. When students watch lectures on their own, he says, they have to wait to ask for any clarifications.

He also worries about screen time.

"We know from studies that kids are spending an average of six hours a day in front of the TV or a computer," he says. "Do we want to add to that?"

That hasn't stopped Bill Gates. He invested \$1.6-million in the Khan Academy, run by Salman Khan and Mr. Sinha.

Their videos – there are now more than 2,600 – allow students to watch lessons on everything from plate tectonics to integer sums, pausing and rewinding "the teacher" at will.

Last month alone, about 3.5-million students logged in.

Some of those students used the videos to complement regular classes. Others were directed to videos by teachers in flipped classrooms.

Still others are at a pilot Khan school based in Los Altos, Calif., which integrates online lectures with other tech tools to allow even better feedback between kids and teachers.

These students watch math lectures on their own, but then solve problems through a computer program that allows teachers to watch over their shoulders. A dashboard provides live feedback on how many problems students have completed, the type of problems they got wrong, and where they might need help.

"The teacher now has a higher role, a more important role, because they're mentors to their students," says

Mr. Sinha.

And it doesn't take a billionaire philanthropist to take this approach.

A few hundred dollars in software and a principal desperate for change turned Clintondale High School around.

Near Detroit, 75 per cent of the school's students live below the poverty line, and the district has been in debt for a decade.

Two years ago, principal Greg Green was looking for a way to even the playing field for his students. "We needed to eliminate the obstacles that kids faced," he says.

Mr. Green worked with a couple of teachers to flip just one classroom at first, and then all of the freshmen. Within a year, discipline rates fell by more 65 per cent, half as many freshman are failing English, and standardized test scores in math jumped 10 per cent.

Mr. Green says it works because teachers are getting more face-time with their students, identifying where they're struggling.

As for access, Mr. Green left computer labs open for an hour before and after school.

"The reason students are struggling isn't about finances or effort – it's a structural issue," he says. "If a school like ours can do this, it's just the mindset that's stopping others."

Mr. Johnson is trying to change that mindset at his Kelowna school. He and two other teachers have helped flip senior math and biology classes, and he is tracking the impact on students. Next summer, he'll present his findings at a conference on flipped classrooms open to all B.C. schools.

"I can't say this is the silver bullet for education quite yet, but everything seems very positive," he said.



Walker Shanks is doing his homework at his West Kelowna B.C. home on Monday November 14, 2011. He is in a Grade 10 flipped math class at Okanagan Mission Secondary School.

Jeff Bassett/The Globe and Mail

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