Why I'm Optimistic About the Next Wave of Education Technology

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Over the past 25 years, multiple waves of education technology and innovation have slowly washed into America's schools and colleges. Along the way, innovators have often over-promised and under-delivered, causing many smart people to wonder if we're now in a **[frothy bubble](#)** of irrational exuberance, most eloquently summarized by Audrey Watters in Hack Education, who worries that "education technology [merely] **[serves as a 'Trojan Horse' of sorts](#)**, carrying... the ideology of Silicon Valley [into public schools]."

Working as an entrepreneur, executive, philanthropist and investor over the past few decades, at some of the very organizations Watters bemoans, I've had a unique vantage point for observing numerous successes, failures and—most importantly—long-term trends that make me optimistic about the next wave of education innovation. Although the pessimists correctly observe that

many questionable edtech startups have been over-funded and over-hyped these past few years (and some of the biggest are likely to crash to Earth in the near future), it's simultaneously true that the next decade is likely to see the birth and growth of some of the most transformative education companies of this century.

My bet is that by 2040, our children will look back on this period between 2015 and 2030 in education technology much the same way internet historians look to the period 1995 to 2010 as the birth of the commercial web. The new millennium started with the **dot-com crash** which decimated 78 percent of the value of the NASDAQ and hundreds of first-wave internet startups went bankrupt. But during that same fifteen-year period, we also witnessed the birth and growth of highly influential firms like Google, Amazon, Facebook, Tencent and Alibaba.

Edtech, I believe, is going through a similar rebuilding moment powered by three trends: widely available infrastructure, the catalytic impact of spending by both the government and philanthropy in education, and—finally—the embrace of edtech by educational institutions and educators themselves. Not yet convinced? Join me on a quick tour of the past quarter century in education technology history.

1993-2004: Building the Infrastructure

Working closely with partners, I spent the years from 1993 to 2004 starting and leading a handful of technology startups. The first online class we launched in 1998 was little more than flat text on webpages, and we closely followed the birth of learning management systems, meeting with both Blackboard and WebCT before they achieved their first $1 million in revenue. In 2002, our team at Microsoft Education created an LMS for a world where every teacher and student had a tablet computer.

The only problem was that that world didn't yet exist. Tablet computers didn't take off until a decade later. The web was increasing its use of graphics, but had barely adopted video. Although we were convinced that technology could transform education, simple internet access was patchy at best. As recently as 1997, only 27 percent of America's K-12 school had internet access—a number that **skyrocketed to 92 percent** by 2003. But visions of a world where every teacher and every student had an internet-connected device, and every student would get personalized assessments for learning, were still just that—visions. The infrastructure just wasn't ready.

Nowadays, 99 percent of classrooms are wired with high-speed internet (which is very different than schools being "wired"), more than half of schools have wireless capability, hundreds of school districts have 1:1 devices and the U.S. Department of Education has researched and published an excellent National Education Technology Plan (**PDF**). The infrastructure challenges of that first wave aren't completely solved, but they are mostly solved—and today's challenges have little to do with lack of wires, routers or devices.

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2004-2011: Washington Leans In

Between 2004 and 2011, I worked as an executive in **SchoolNet** and **Kaplan**, both of which grew into successful and innovative education companies. This was the era of **No Child Left Behind**, when America's K-12

districts got religious about regularly measuring student and teacher results and when test prep and online colleges became thriving businesses. And behind the scenes, the federal government played a critical role in driving these trends.

SchoolNet built and marketed an "instructional management system" that aimed to deliver useful data about student progress to teachers and administrators. Our system was user friendly, allowing educators to see student grades, benchmark assessments and progress against standards on student dashboards. But the bigger driver of our success was new government policies; specifically, No Child Left Behind and specific funding under the **Enhancing Education Through Technology** program—and our focus on selling multi-year enterprise contracts to large districts. (To this day, too many entrepreneurs try to sell to schools, teachers or parents, when 90 percent of the budget and decisions in K-12 are made at the district level).

The edtech industry made big strides during this era. School districts developed IT departments, even creating and hiring for the title "**CTO/CIO**." Internet ubiquity in the classroom led teachers to adopt email and experiment with other technologies. Summative and formative assessments, powered by technology, became much more commonplace and almost every school district developed a strategy around using data to measure school, teacher and student performance. Many districts analyzed their performance and implemented reforms that led to **higher student achievement and graduation rates**. (I wish everyone knew that our nation's high school graduation rate reached a record high 83 percent in 2016, probably about nine percentage points higher than 2002 when NCLB was passed and we couldn't even agree upon or calculate the rate!)

SchoolNet helped many of these districts—and benefitted as well. As a result of solid leadership, great product, friendly government policies and large enterprise contracts, SchoolNet rode the accountability and assessment wave to almost $40 million of annual revenue and a **$230 million acquisition**

by Pearson in 2011.

At Kaplan, I came to see even more clearly how government policy drives some of the biggest successes in education technology—and exactly how policy's invisible hand can be 10 to 100 times more powerful than Adam Smith's free market when it comes to education. Kaplan thrived during the decade, growing to more than $2.8 billion in global annual revenue by 2010, helped immeasurably by hard work and acquisitions.

That said, Kaplan's growth was substantially driven by what seemed like a modest change in 1998 to the Higher Education Act, which allowed accredited colleges to generate **up to 50 percent of their Title IV revenue** (student loans and grants) from correspondence or distance-learning courses. It was a policy change that greatly encouraged the growth of "telecommunications correspondence" courses.

In 2006, legislators amended the Higher Education Act again, eliminating the 50 percent rule and allowing for-profit colleges to generate **up to 90 percent of their revenue** from government sources, which most often applied to for-profit colleges offering online courses. If the 1998 change in HEA enabled the birth of online higher education, this next legislative change caused postsecondary online education to grow even faster as millions of adult and part-time students enrolled in for-profit, usually online, colleges funded by tens of billions of dollars in federal loans and grants.

Together these two little-noticed legislative changes helped create multiple billion-dollar online education companies over the next decade, including Kaplan, University of Phoenix, Capella, Strayer, Bridgepoint, Grand Canyon and many others. Kaplan Higher Education, which included more than 80 ground-based colleges and one very large and fast growing online university, grew from less

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than $10 million in revenue in 1999 to $1.9 billion in 2010.

In sum, the primary growth driver for all for-profit, online colleges during the 2000s (including Kaplan) were two legislative changes in 1998 and 2006, which together channeled **tens of billions of dollars** in student loans and grants to students, which they used to enroll in convenient online programs largely offered by for-profit colleges, until the past few years when technologically-savvy nonprofit colleges and universities began to really appreciate the importance of the trend and made huge strides in offering these programs themselves.

In large part because of the growth of for-profit colleges during the 2000s, smart market observers now keep a close eye on **how the invisible hand of policy shapes education markets**. They've developed a keen ability to spot other education companies with the potential to capitalize on giant pools of revenue created by tiny legislative changes. For example, over the past few years, 23 states have made computer science courses a graduation requirement and authorized special funding to promote their growth. As a result, hundreds of school districts are now scrambling to adopt and deploy computer science courses—and a number of startups are dipping into this new revenue river.

2011-2020: From Early Adopters To Mainstream Adoption

The past few years have seen an explosion of education technology companies and investment, with more than a billion dollars of venture capital invested in U.S. education technology companies each year for the past three years. A handful of these startups will grow into billion-dollar education companies in the years ahead.

Smith's free market when it comes to education.

2U has already proven that a billion-dollar education company can now be created from scratch in only seven years. **Lynda.com's $1.5 acquisition by LinkedIn in 2015** shows that billion-dollar exits are not limited to companies in higher education. **Purdue's recent acquisition of Kaplan** and **ETS acquisition of Questar for $127.5 million** show that even nonprofits understand that the digital revolution is transforming education and they are making acquisitions that would have been unheard of in a prior generation.

But the most interesting developments are happening a little further downstream. **StraighterLine** has proven that the cost and price of quality online education can be driven down to Netflix prices. **ASU Global Freshman Academy**, Coursera and edX have taken the StraighterLine model—and pushed it even further. But we're still in just the first inning of the game, because less than 10 percent of college students know that StraighterLine or ASU Global Freshman Academy exist. During my tenure at the Gates Foundation, I learned how evidence-based innovations and reforms like these are guided by the hand of philanthropy in a way that's similar to how public policy shapes the market. (For more details, **see my 2015 piece**)

EdSurge tracks **more than 2,400 education technology companies**; LearnPlatform allows educators to see and rate more than 4,000 edtech products through **their Chrome web browser**. For all you science nerds out there, we are definitely in the middle of the Cambrian explosion of education technology: If historical trends hold up, more than 80 percent of the edtech startups created in the past five years will not survive through 2020. But those that do survive and build successful enterprises could change the world forever. Observing the internet revolution, Marc Andreessen famously wrote "**software is eating the world**." From my vantage point, technology is transforming education from an art into a data-driven learning science.

My partners and I at **New Markets Venture Partners** have been

observing this market for more than a decade and we've made investments in **25 edtech companies** during that timeframe; 24 are still healthy. We've also had seven successful exits over the past decade. Having watched the education market evolve through multiple cycles, we believe we can spot which education technologies have the wind of government policy or philanthropic support at their back, which are starting to "cross the chasm" from early adopters to early mainstream clients, and which have the essential building blocks common to all successful venture-backed companies. No surprises here: Those ingredients include strong leadership teams, great product that works, highly satisfied early customers, and, most difficult in the education-market, a market-focused scalable business plan with the right unit economics.

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Each year, New Markets takes a close look at about 400 education technology companies and invests in about four. Our 1 percent acceptance rate means we're 4.6 times **harder to get into than Stanford** or Harvard. We need to be this discerning because the education market is really difficult—and it's not just one market. Building and selling products to K-12 school districts is very different than building and selling products for higher education institutions. And K-12 isn't just one market if you're a content company; you need to hone your expertise in particular subject areas, such as math, English or STEM.

Oh, and by the way, U.S. higher education is four markets, too: community colleges, public universities, predominantly online universities and private independent colleges, each of which have subtly different priorities, and do their purchasing and implementation in different ways. In fact, one could

even argue that higher education has more than 15 distinct markets, since there are multiple discipline and functional associations in higher education, some of which are stronger in community colleges or four-year institutions. And I haven't even mentioned how different policies and philanthropy drive funding streams differently for education technology products in each market.

At this point, America's education system finally has all the key building blocks in place: The infrastructure is solid, almost every student has a device and wireless internet access, schools and educators (at all levels) are now much more comfortable working with technology and data, and thousands of entrepreneurs are working—not just with early adopters, but increasingly with early mainstream schools and educators—to bring edtech and personalized learning to the masses.

This is why I'm optimistic about the next decade of educational technology and innovation. I can't wait to see how the next chapter unfolds!

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