

EdTech: Promise and Peril

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Keynote Address

TLPC: Privacy and Education in a Social Environment

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Abstract

In the United States, consumers and school districts are spending billions of dollars on education technology. The promises of technology in education are awesome, but to realize them, decision makers need tools to critical evaluate claims and to carefully evaluate teacher and student need. This talk highlights the challenges that entrepreneurs and educators face in integrating new education technology in the classroom. A complex web of substantive and procedural rules has made adoption of education technology a challenge in the U.S. In addition, excitement about technology has led to poor decisionmaking. The good news is that trusted resources are being developed to evaluate the efficacy of education technology, and one can learn from the U.S. experience in education technology.

Keywords: Education Technology, EdTech

EdTech: Promise and Peril

Introduction

Consumers and school districts are spending billions of dollars on education technology (“EdTech”) to serve a diverse set of interests in learning and in the administration of schools. The purposes of technology adoption include purely educational ones (tailored instruction and personalized learning), administrative and communication-related needs (dashboards to monitor school-wide performance and platforms to communicate with parents), and ones that expand the reach of the school (extended learning time and other attempts to teach outside the classroom).

Because Edtech has such diverse goals, diverse implementations, and because it comes in so many forms—from the digital whiteboard to adaptive software—the contours of Edtech are blurry.

Roadmap: lessons from the US experience

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- Insights from my spring 2016 course: Education Technology: Policy, Design and Law
 - Focus on K-12—grade school education
 - Lens: both as academic and practitioner
 - Assumption at outset of the course: privacy law would be a major barrier to edtech
 - This talk is about privacy, but also the other difficult challenges in incorporating technology into education

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This keynote address focuses on several lessons that can be drawn from the U.S. experience in adopting education technology. Much of this talk is drawn from my Spring 2016 course at UC Berkeley’s School of Information focusing on Edtech. In this course, my students focused on the Kindergarten to 12 grade levels, the equivalent to Turkey’s 4+4+4 education plan. I also have had several Edtech clients, and assumed at the outset of the course that the efficacy of Edtech would be profoundly shaped—and even possibly harmed—by privacy law. That is, limits on the collection and use of personal information would stand in the way of highly-adaptive

personalized learning systems and interventions. But what we found was that privacy was just one minor challenge to adoption of new technologies in the classroom.

Pathologies observed long ago by scholars such as Larry Cuban¹ continue to shape technology

adoption in the classroom. Today, I focus on four areas of tension: substantive and procedural regulation of Edtech, the importance of planning for implementation of Edtech, the regulation of Edtech claims and the weakness of currently-available assessment methods, and finally, political dimensions of Edtech.

Fantastic possibilities of edtech

- Tailored instruction
- Better engagement
- Teaching outside the classroom (e.g. field trips)
- Target specific student needs
- Communicate better with parents (esp. dual language households)
- Extend the school day
- Increase digital literacy
- Contribute to teachers' professional development
- Embed assessment into the learning process
- Level the playing field among low and high resourced schools
- Increase efficiency
- Increase educational productivity
- Overcome political barriers (resistance to new curricula, extended learning time)
- Adapt to students with different abilities

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EdTech Challenges

Fast by design meets slow by design

Technology companies wish to move quickly, but educational institutions cannot match their speed—and for good reason. Educational institutions are consumers in a sense, and because they spend public funds in consumption, their purchase decisions have to be deliberative and careful.

¹ LARRY CUBAN TEACHERS AND MACHINES: THE CLASSROOM USE OF TECHNOLOGY SINCE 1920 (1986).

Procurement rules form perhaps the biggest speed bump for technology companies. To prevent graft, poor and impulsive decisionmaking, and to ensure accountability in public finances, procurement rules have proliferated. These rules, while well intentioned, are difficult for small companies to manage. Startup companies have to participate in competitive bidding with more sophisticated and well-resourced actors. There are thousands of school districts, and in some cases, a company representative has to appear in person in order to qualify for the bidding process. In any given district, the

procurement manual can be 100 pages long. Good technology-selection activities, such as pilot programs, can become ensnared in anti-kickback protections that impose a “cone of silence” between the technology company and the purchaser. All of these

Fast sellers...but buyers are slow by design

- Procurement slows the process
 - Competitive bidding
 - Different triggers for bidding requirements
 - District-by-district competitions
 - LAUSD’s procurement manual is 100 pages long
 - May have to appear in-person to qualify
 - May be “cone of silence” during bidding process
 - Pilot studies can undermine one’s bidding posture
 - Regulation complicates procurement, causes drive to centralized planning
 - Startups don’t have funding for months or years-long procurement
 - Procurement planners may not envision innovations possible
- As a result, tech industries are trying “burrowing in” strategies—marketing directly to the teachers in hopes that the technology bubbles up to centralized decisionmakers

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factors work against the small startup that wishes to quickly scale across the country.

The complexity of procurement rules, and the challenge that Edtech companies cannot practically manage bids among thousands of school districts leads to a problematic strategy: Many small Edtech companies are “burrowing in” school districts by directly marketing to teachers and parents. These companies hope that selling directly to the teacher will cause parents and teachers to band together to demand a more formal adoption of the service.

Why is the strategy problematic? While teachers and parents are focused on the pragmatic goals of getting their work done, signing up for any given Edtech may overlook

various regulatory mandates. In the U.S. privacy framework, at least five major laws regulate Edtech. We have a longstanding law that regulates “student records,” in the sense that there is a “file” on a student containing information about grades, teacher observations, and courses taken.² We have a law that regulates how students can be surveyed on politically-sensitive matters.³ Another law requires schools to filter internet connections against pornography and other inappropriate material, or they lose federal funding.⁴ Two other laws impose substantive privacy protections on Edtech providers, and in effect ban tailored advertising to students.⁵ Taken together, these laws and a general commitment toward welfare of the child can cause developers to make kinder, more privacy-friendly technologies.

In addition to this motley assortment of privacy rules, the United States has deep commitments to including people with disabilities in both public and private accommodations. The need to accommodate the disabled extends to many technologies in the classroom, and this comes at great expense. Yet at the same time, designing for the disabled helps more than just those with disabilities. It pitches developers toward openness more generally, perhaps reducing the risk of other pathologies in technology adoption, such as lock in.

The burrow in strategy of technology adoption makes sense strategically given the advantage that big companies have over smaller ones in formal procurement. But burrowing in may place students at privacy risk, and may result in some being excluded from beneficial Edtech.

² Federal Educational Rights Privacy Act (FERPA).

³ Protection of Pupil Rights Amendment (PPRA).

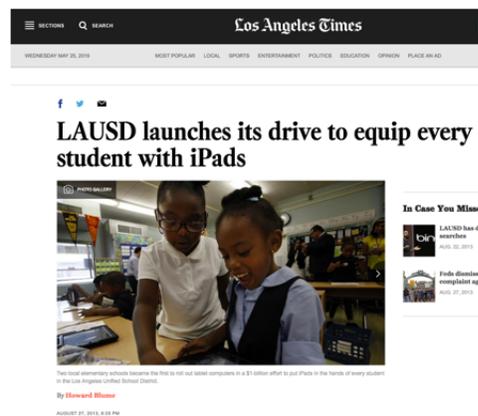
⁴ Children’s Internet Protection Act (CIPA).

⁵ Children’s Online Privacy Protection Act (COPPA); Student Online Personal Information Protection Act (SOPIPA).

Exciting technologies and boring implementation

Edtech companies and education reformers are rightly frustrated with the procurement process. Sometimes they are so frustrated that they cut corners, resulting in ineffective, expensive technology adoption. Some have tried to punch through the political process by selling the public on some exciting technological venture. That was one aspect of a deeply problematic “one-to-one” plan in the Los Angeles Unified School District (LAUSD). One-to-one plans seek to put a computing device into the hands of each student. Among the goals of one-to-one programs is to bridge the “digital divide” between the rich and poor with respect to access to technology.

Yet excitement leads to hype, corner-cutting



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From the start, the LAUSD program was called the “iPad” plan. One can immediately see the appeal of the program—everyone gets Apple iPads! But as discussed before, school districts are supposed to follow neutral competitive bidding processes. The LAUSD plan left the starting gate with a specific, expensive product in mind. The program quickly found itself in trouble: the iPad was adopted before the educational content and curriculum were ready. The initial assessment of the program found that few teachers were even using the devices regularly because of a lack of curriculum.

The LAUSD program's problem were foreseeable. We naturally are more excited about getting technology than implementing it. However, planning for implementation is as important as the technology chosen. One has to think through not just the pedagogical issues (curriculum, cheating, etc.) but also the physical dependencies that the technology requires. One cannot take it for granted that any given school will have adequate power outlets, hundreds of network connections, staff available to fix broken devices, and appropriate training for teachers.

LAUSD's one-to-one program also experienced trouble in students' homes. Recall that schools are required to filter

internet access of children. In LA, some smart students figured out how to circumvent the filter. The LAUSD responded by prohibiting the students from taking the devices home. That undermines the one-to-one goal of getting technology into the hands of the needy. But it is also the case that some of the neediest fear the one-to-one plans for non-obvious



LOCAL AUGUST 27, 2013

LAUSD launches its drive to equip every student with iPads

By **Howard Blume**

Two elementary schools — Broadacres in Carson and Cimarron in Hawthorne — roll out the tablet computers. Some question if they will help learning.



LOCAL SEPTEMBER 18, 2014

L.A. Unified survey finds little use of iPads' curriculum

By **Howard Blume**

In the first formal evaluation of the troubled iPads-for-all project in Los Angeles schools, only one teacher out of 245 classrooms visited was using the costly online curriculum. The reason, according to the report, was related to the program's ambition, size and speed. The analysis found that...



L.A. NOW SEPTEMBER 25, 2013

LAUSD halts home use of iPads for students after devices hacked

By **Howard Blume**

Following news that students at a Los Angeles high school had hacked district-issued iPads and were using them for personal use, district officials have halted home use of the Apple tablets until further notice. It took exactly one week for nearly 300 students at Theodore Roosevelt High School...



EDUCATION AUGUST 22, 2014

LAUSD report faults iPad bidding

The groundbreaking effort to provide an iPad to every Los Angeles student, teacher and school administrator was beset by inadequate planning, a lack of transparency and a flawed bidding process, according to the draft of an internal school district report obtained by The Times. The bidding process...



EDUCATION DECEMBER 2, 2014

FBI seizes LAUSD records related to troubled iPad program

By **Howard Blume**, **Victoria Kim** and **James Rainey**

Fallout over the Los Angeles school district's \$1.3-billion plan to provide iPads to every student intensified Tuesday with the revelation that the FBI is conducting a criminal investigation into the failed effort. FBI agents seized 20 boxes of records related to the iPad program Monday, and court...



L.A. NOW DECEMBER 2, 2014

Federal grand jury subpoenaed documents from L.A. Unified

By **Howard Blume**

L.A. school district officials turned over 20 boxes of documents Monday in response to a federal grand jury subpoena for documents related to its troubled iPad project, officials confirmed Tuesday afternoon. The subpoena asked for documents related to the bidding

reasons. For instance, one lesson of the One Laptop Per Child (OLPC) program was that poorer families did not want to have the devices at home based on fears that they bore risk of loss for damage, loss, and theft of devices.

There is also the problem that our imagined uses of devices in one-to-one programs diverges from actual use. We imagine a classroom that extends into the home, or the creation of a generation of “hackers” who

teach themselves programming and

become the next Silicon Valley

millionaires. In reality, the killer

app is entertainment. A parent

would not get excited about a

school district that proposed to

give each student a portable

television, but in effect, that is what happens in many homes. Consider that device use for

gaming and entertainment purposes may be even more intense in low-resource environments

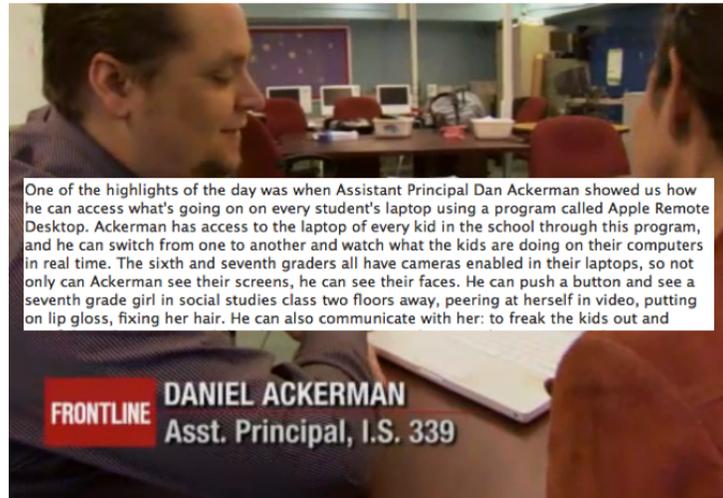
where parents cannot supervise children’s activities—the very homes that one-to-one programs

are supposed to benefit.

Implementation typically overlooked

- 1 to 1 programs arrive with excitement, and displace careful consideration of implementation
- Pedagogical
 - Curriculum in place? Content ≠ a curriculum
 - Cheating
- Logistical
 - Infrastructure in place? (wifi, power)
 - Training for teachers
 - Theft, loss, damage (who pays?)
 - Must be secured against attack, filtered for inappropriate uses
- Cultural
 - At home, the device might not be used as expected ☹

Devices may not be used as envisioned at home. But they also may be used imaginatively by school officials. Consider that many one-to-one devices include a webcam. In one case in the U.S., school officials turned on those webcams to watch students, sometimes while the students were at home.



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Edtech claims and assessments

Part of the allure, the excitement of Edtech surrounds the belief that teaching can become more productive and efficient. There is a scene in the popular movie *The Matrix* where the protagonist learns Kung Fu in minutes from a virtual reality system. Collectively, we stand wide-eyed at the prospect that computing could make learning easy, quick, and fun.

In surveying the marketing efforts of Edtech companies, my students spotted several trends. First, the gold standard for assessment of a technology, the random controlled trial (RCT), is rarely used. This makes sense because RCTs are expensive and difficult to implement.

Challenges in assessment

- The gold standard, the random control trial (RCT) is difficult to implement
 - Costly, time consuming
 - Can be unethical to deny people the benefit of an intervention
- As a result, edtech relies on some less reliable approaches
 - Pilot studies
 - External assessments
 - Ratings and testimonials

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Furthermore, schools are reluctant to implement RCTs because they inherently involve a subject population that does not receive the technology treatment. RCTs can thus appear to be unfair or even unethical.

Second, because RCTs are so difficult, Edtech companies often rely on pilot studies, external assessments, ratings, and testimonials. Third, non-RCT

assessment methods shape how Edtech is advertised. The advertising claims tend to be functional and vague, as in “[our product] delivers rigorous standards-based curriculum...” or

“[our program] can combine data

from multiple learning contexts and dynamically adjust gameplay.” Do these functions promote learning better than alternatives? The advertising does not directly say so, because the research isn’t there yet. So the claims encourage the consumer to connect the dots between these functions and the real goal: improving

learning outcomes. Naïve

technology optimism encourages us

to make the leap, but we have to

resist jumping.

Edtech claims tend to be

functional and vague because

Vague claims...tend to be functional

Our ALP (Adaptive Learning Platform) can combine data from multiple learning contexts and dynamically adjust gameplay as learners engage to help you deliver a personalized learning experience for each child.

GradPoint: Your classroom, only more extraordinary

Welcome to online and blended learning at its best. GradPoint™ delivers rigorous standards-based curriculum, assessments, student data, and reports. Hundreds of districts use GradPoint to create 21st-century learning environments that prepare students for future success. But what they really love is how this easy-to-use platform gives teachers and students unprecedented ownership over their education.

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Why are claims functional, vague? False ad law

- Products that make objective, material claims have to be “substantiated” under the Federal Trade Commission Act (FTC Act)
- What does this mean?
 - Advertiser must have a “reasonable basis” for the claim prior to making it
 - FTC considers many factors—
 - Type of claim
 - Type of product
 - Cost of substantiation
 - The consequences of a false claim
 - The benefits of a truthful claim
 - Amount of substantiation that experts think is reasonable
- Paid endorsements must be disclosed
- Testimonials have to be accurate and up to date. Payment must be disclosed

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advertising law in the U.S. requires companies to “substantiate” material claims. Companies must have a “reasonable basis” for a claim *prior to* making it. In recent years, the U.S. Federal Trade Commission (FTC) has focused its enforcement efforts on companies that make health-related claims without RCT-level proof.

Thus, Lumos Labs, the creators of Luminosity Software, found itself the target of a FTC investigation for making claims about how use of its software could treat age-related cognitive decline, and make one perform better at work, school, and play. Lumos Labs is a company run by serious scientists who do RCTs in their work. Their studies show that cognitive brain training does benefit users. However, it is still unproven whether these benefits transfer to everyday life skills. It was this gameplay-to-real-life gap that the FTC thought needed to be proven through a RCT.

Lumos also was accused of giving compensation to consumers in exchange for testimonials of the Luminosity product. Under US law, the fact that an endorser is paid is material and has to be disclosed. Similarly, testimonials must be accurate and up to date. These are traps that many technology companies fall into, and there can be serious consequences, especially for small companies. For instance, the FTC sued Lumos’ founders in their personal capacity, because the agency believed that the founders were aware of the alleged deception.

Edtech studies are plagued by a basic problem: non-tech interventions—even the presence of assessment—may explain gains in performance

The good news is that trustworthy sources have begun to emerge for the evaluation of Edtech, so that we do not have to rely so heavily on the kinds of marketing pitches technology companies choose to share. A group called Digital Promise has released a framework for evaluating Edtech research. And a Department of Education project, the What Works Clearinghouse, features one-page long assessments of specific products. These resources should be among the first consulted when evaluating an Edtech.

The political as a peril

I started this talk by discussing the rich possibilities and uses of Edtech. Notice that some of them serve goals that are made complex by the politics of education. Extending the teaching day, changing the teaching calendar, or encouraging teachers to learn new curricula all can provoke resistance—sometimes justified resistance—from teachers and the powerful political machines that stand behind teachers.

The slow pace of education reform and the resistance of teachers unions have led some to see technology as a wedge for political change in education. But technology does not remove the politics from education. It simply reallocates power, perhaps away from teachers and elected officials to those who control the technology. I am not sure we have thought through the implications of such a switch. Why would we assume that Google or Facebook has the student's best interests in mind?

The personal and the social

- Edtech focuses on personal learning but what does this mean?
 - First step in personalization is assessment of student progress
 - Isn't that just good teaching?
- What does personalized learning mean for the social?
- Is personalized learning a political wedge?
 - What falls out of focus when one emphasizes personalized learning?
 - Ignores structural problems
 - Unfairness
 - Failure rests on the individual
- Hiding behind personalized education is a political effort to reform schools

Education technology not only can shift power, it can reframe education policy debates in subtle ways. For instance, when we promote personalized learning, the individual becomes the focus of educational outcomes. This may lead us away from considering deeper political issues, such as the role in how infrastructure, inequality, and poverty affect learning.

Larry Cuban: the challenge of structure



Johnston, Frances Benjamin, 1964-1962. Washington, D.C., school survey

- Classroom demands of order, respect for the teacher cause resistance to change
- Is the tool reliable?
- Available?
- Useful to the teacher?
- Measurement, tech in the classroom cannot address out-of-classroom social challenges

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Conclusion

There is much to learn from the U.S. experience in Edtech. In three words, it could be summed up as “avoid magical thinking.” This is difficult to do when technology is involved!

The LAUSD leadership thought magically when it confused getting iPads with the goal of enhancing student learning. The proper approach is to start by understanding the needs of students and teachers, and then by

assessing whether a technology is appropriate to meet those needs.

Simply put, LAUSD confused ends and means. It treated getting an iPad as an end rather than a means to some other goal.

In conclusion, a smarter approach

- Learn from the US experience!
- Technology is not the need (end), it is the tool (means)
 - What do students and teachers need?
 - What kind of tablets should you buy? iPads or iron tablets?
- What are the technology’s hidden costs?
 - Who does support, training?
- Critically evaluate claims; consult trusted resources
 - EduCause, Digital Promise, What Works Clearinghouse
- Recognize that edtech can mask a political tussle

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We think magically when we overlook the hidden costs and disruptions that technology brings to the classroom. LAUSD vastly underestimated the cost of the iPad program, and had to scramble to get ahead of predictable problems such as theft and damage to the devices. In New York City, officials spent \$500 million simply to connect classrooms to the internet. These hidden costs of infrastructure and of implementation may change the economics of Edtech. These costs displace other opportunities, such as the hiring more teachers, and they may make Edtech a bad deal.

We think magically if we fail to critically evaluate the marketing claims of Edtech. The lack of reliable studies on efficacy points to a deep problem: the disconnect between society's optimism about technology and the possibility that these technologies may simply not be effective. The good news is that several trusted sources, such as EduCause, Digital Promise, and the What Works Clearinghouse, are helping develop a reliable literature on efficacy.

The political is the real peril

- Technologies arrive as “neutral” tools
- Promoted by naïve optimists—not experts in technology or its history, but rather technophiles
 - Or worse—people using technology simply to capture part of “The Prize”
- Technologists, teachers, and policymakers are all trying to control what gets taught, and how it gets taught
- These interventions are often top-down solutions where reformers arrive with all the answers (and expensive consultants)
- The public pays the bill and is saddled with the outcomes

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Finally, we think magically if we think technology is apolitical, or that Silicon Valley just wants to help us learn more efficiently. The creators of these technologies are often deeply committed to reducing protections for teachers and for tying teacher performance to testing (another form of Edtech). In so doing, these companies are not only trying to capture money that currently goes to paying educators, they are also taking control of teaching. Edtech reformers tend to have a top-down view of what works. They arrive with expensive consultants and naively

optimistic views of technology's effects. In the end, we end up paying for the Edtech bill and we are responsible for the outcomes.