

Disruption: The Sum of the Effect

What's the sum of all this semi-invisible disruptive force known generally as the technology transition running over and through our education system? Is technology villainously ruining the idyllic word of educational institutions?

Besides everything already mentioned about the changed world due to technology, teachers are also experiencing a skyrocketing workload. Teachers are exhausted. There are shortages because many new teachers give up too soon. In fact, our own Learning Counsel research found that 25% of instructors' time is now spent on 1) searching for digital curriculum, or 2) custom building a digital lesson plan. Additionally, many of these same teachers claim to be spending a lot more hours working.

“Of the 4,450 respondents to the Guardian teacher network and Guardian jobs survey about teachers' lives, 82% stated that their workload was unmanageable, with two-thirds saying that expectations had increased significantly over the past five years. And 73% of respondents said their workload was affecting their physical health and 76% their mental health. Almost a third of teachers reported that they worked more than 60 hours a week.”

– Rachelle Banning-Lover, *The Guardian*

In addition to stress from managing the technology revolution, the Washington Post summarized

Key Points

- Total disruption is due to what's really missing: not enough tech sophistication that is truly student-centered, teacher, and administrator levered as well as a needed open incubation arena for a consensus network “un-structure” of personalized learner paths.
- As learning moves into consumer-grade online experiences, the software systems for it may never be “done,” but will continue to get grander.
- An un-structure in our form of educational distribution gives the individual the freedom to use tech to learn and compete against tech and their peers via tech.

a number of studies indicating general low morale with teachers, a situation few Americans would consider abnormal.² With an epidemic of school shootings, violence against teachers anyone can see on YouTube, and mass and repeating changes to policies, it is an acknowledgement to the passion and integrity of teachers that more don't give up.

*“In Chicago and elsewhere, the reason public school students in major cities are suffering so much is because union leaders don't want to focus on making concessions or prioritizing funding for the classroom, at least not if it means they would have to reform their compensation and retirement benefits. When it comes to school negotiations, arguments among adults have taken precedence over educating kids,”*³

– Hilary Gowins, *The Huffington Post*

The sum of the effect is clear for anyone to see, because we are hearing about it everywhere – failures. Where prior to the tech incursion altering all the other industries we had reached great highs of literacy and graduations and were fairly pleased with ourselves, statistics are falling in our existing public structures.

The other result is growing awareness of a consumer-direct tech-alternate route – a bypass of the public system because it's “not working.”

What's Missing?

What's wrong with the current state of technology incursion into education is actually that *there is not enough of it* in education, and the not-enough-of-it

is orders of magnitude above what is currently there. Most non-technical teachers and administrators cannot see what's missing; they only see what is there now.

What has been happening with industry products is the same stepped approach that has occurred with the education side, purchasing first projectors, then TVs, computers for labs, interactive whiteboards, then computers for everyone, and finally digital courseware, apps, and possibly even a Learning Management System and Student Information System. Companies are making digital things that replace what were once textbooks and workbooks, systems that replace grade books, and digital rosters to replace attendance sheets. Of course, there have been some real new innovations but these have still been adapted to the existing structure. Companies, as a matter of necessity, have to sell to what is there, what they can earn revenue on, what schools will rip-and-replace with a digital alternative. They are in a constant juggling of trying to push what's new while actually selling more of what's old.

What's missing is an autonomous digitally oriented alternative with full coverage of all subjects that has learner centricity as its very first and only relevant precept. This does not exist yet, to my knowledge, in its entirety. Of course, the vision is the same level of dazzle as the biggest online shopping sites, media hubs, and consumer games mixed in with the best of machine intelligence and online chat or telecommuting teachers-on-demand. There are some pockets of excellence and new apps arriving, but the entire journey through the academic standards, and beyond that for tangential learning interwoven

with projects, is not totally crafted yet. Travel planning the individual student's journey itself could be a whole programmatic area for software and for the tie-in with institutions, creating an inter-weaving of the online with the offline experience.

As learning moves into consumer-grade online experiences, the software systems for it may never be "done" but will continue to get grander.

The Goal: Student Centered Learning in a Digital Age

Properly implemented technology allows for the individual content and lines of questioning to build from foundations around an individual, dictating, therefore, the governing form, the human interactions required, the time, any physical convening space, and speed of delivery.

This type of learning would be a full leveraging of tech directly, without consideration of the existing institutional or teacher-learner structure. Yet build it, and consumers will come. That is evident from the mass followings online by learning apps and sites.

There are just a couple of tricky parts. The most significant of these is the burgeoning capability of intelligent learning engines. Although not truly "A.I.," or artificial intelligence, machines are starting to get pretty close.

For example, instead of using the brute force of *Deep Blue*, as in the IBM program that defeated chess champion Garry Kasparov over twenty years ago, new programs go beyond encyclopedic databases of potentialities and strategies that use superior code-crunching aimed at overwhelming

with sheer power. Now, intelligence engines are built in a layered approach analogous to how the human mind operates. Each layer is an artificial set of algorithms that recognizes patterns, similar in theory to a neural network using a lot of big data, and when layered on each other can form constructs and evaluations. Each layer passes up to another layer in a decision chain that acts like a brain. These new capabilities are known as “deep learning” because of the layering. Super-fast computing makes the massive crunching of ever-more layers of data easier than ever before. This is the up-and-coming age of teaching and learning in just the next few years. The current IBM version is called *Watson*, and, like some of the programs emerging in the education field, leans on this idea of machine learning.

The Administrator’s Role

Leaders look at these shifts as they see “techie” teachers using new tools and understand that their role and function must change. They see they must harness this new power but have little knowledge of how to really do that. Many do not have the idea of tech being ubiquitous, a sort of “it’s-everywhere” in the function of education. They do not even yet expect it, but leaders in the field are now starting to talk like that, at least from an infrastructure viewpoint.

“Technology in a school needs to be as simple and expected as light when you flick a light switch. Nobody thinks about it. When I walk into my office and I hit my lights, and I want my lights to come on, I want them on, and when I walk out the door

and I'm not using it, then I don't care about it. We need to be that invisible, and if we're not that invisible, then we are absolutely impacting teaching and learning. I think here at Houston ISD we're well on our way to becoming that invisible to the organization. The way I see it, you get your seat at the table by supporting teaching and learning by being invisible and always on. In fact, it's above and beyond even that because you need to also redefine ways in which you're improving and making more efficient, the teaching and learning process."

– Lenny Schad, Chief Technology Information Officer, Houston ISD

Most of the time school leaders are far from the view expressed by Schad in the quote above. They are missing the attitude of dominating tech administratively. What's also missing is the software tools leaders *should* have to hand with a set of algorithms already built for every human assessment, every sense, and every perception point, so that a simulation of actual intelligence is accomplished, such as we are starting to see with smartphones and online ad tracking.

This seems like a long way off for the education market. What is missing for administrators inside software are evaluation points, buttons on the screen, and feedback loops that make it really clear automatically what is going on with a student's learning by inference, including emotionally and experientially. Presently, they must struggle along with tools that do not present those distinguishable insertion check-points with machine logic

that involves the best of teachers very simply – as simply as using their smartphone apps. When that day comes and all the software is that good, administrators will see every teacher shine as beacons of tech integration. And the tech will give teachers back their power, because they will have real assistance, not just tools.

What's Unavailable?

What's unavailable so far is a full digital transition in education with the real heritage of American democracy – open country to incubate the networked system that will work and an experimental playing field divorced from most common structure but fortified by public funding and a quality promotional campaign. Alternatively, the private sector could do this just as well. Some of this has been done with fully online charters attached to the state levels as in California, but those do not seem to have a social support structure into communities that engage instead of completely replacing the public schools. Those students enrolled are opted out of all physical local interaction and have literally “left the building” to join a sort of unschool that is still a school but totally virtual with remote teachers-by-Internet, although not necessarily highly immersive intelligent software environments. The online virtual school is still a bit “flat” in terms of the technical software sophistication. Additionally, a trade-off of sports, arts, and social interaction is made to go fully online that is perhaps unnecessary.

The thing being semi-proposed with consumerization of learning – a highly actualized digital learning journey completely customized to fit a student with a high degree of quality digital

experience, but not necessarily with physical or social experience – will also miss the point that many online charters miss.

The next thing needed is a real strategic plan that would encompass a role and responsibility shift for everyone in a gradual enough scale that all the current players in the education scene can follow the path to give the best of both worlds, blended together in a wonderful orchestration. This is entirely possible with the right planning on a national scale. This is not “blended learning” the way it is commonly thought of today, as just a technology embedding inside the classroom, but a blending between the worlds systemically at the institutional level.

The war for the survival of public schools is here. We can know it is here, because the number of people arguing about public education and whether charter schools should be allowed to survive and people experimenting with alternatives has never been greater. The number of opt-outers of various types has never been higher or growing as quickly.

Many people believe that public education is so embedded that it is on the same plane with death and taxes. But as more people discover alternatives, and especially the simplicity of a tech-delivered alternative, a sort of negative momentum will build. The negativity has the power to kill public education or force ever more brutal reforms. Again, you can know the war for public education is already engaged because of the fierceness of the discourse.³

Leaders who are entirely comfortable with their reign in schools fear no one and pretend they would never drop down into petty defense,

but that's precisely what is happening to some of the largest districts.

Public education must plan a way through and out that acknowledges with clarity a new economy and creates a workable structure – or “un-structure.”

New Forms and Structures

What's indicated now in the Age of Experience is a consensus network structure similar to those that are already evident in other industries. For education, such a network would knit together the best subject experts, curate knowledge, and facilitate individual students to maneuver amongst the basics they must know and all else they *want* to know. And it should have an eye to the creation of real experiences, digitally and otherwise. It could be a placeless and virtually structure-less modality. Buildings would not be a key factor as telecommuting teachers is a high probability already working in some places, just like tele-medicine.

Using courseware, teacher guides can put the student as an individual at a completely individualized point of entry with a personalized path. The important point would be the freedom of “un-structure” – a fully personalized learning path.

An “un-structure” gives the individual the freedom to use tech to learn and to compete against tech and their peers via tech. This is a novel but important distinction.

Less human interference in things that are common points of knowledge that can be taught by tech, and more human interactions on being human, being moral, and social, will balance what is currently missing from the existing structure.

Interestingly, it probably won't matter if no one changes the current structures and they continue to collapse, because the market is already forcing the issue with the consumerization of learning and alternative schooling. What will matter is a survival bridge-to-somewhere for the increasingly marginalized existing institutions.

¹ Rachel Banning-Lover, "60-hour Weeks and Unrealistic Targets: Teachers' Working Lives Uncovered," *The Guardian*, March 22, 2016.

² Valerie Strauss, "Yes, Teacher Morale Really Is Low – Despite a Report to the Contrary," *The Washington Post*, February, 2014, <https://www.washingtonpost.com/news/answer-sheet/wp/2014/02/05/yes-teacher-morale-really-is-low-despite-a-report-to-the-contrary/>

³ Hilary Gowins, "'This Is Our Story': Chicago Public Schools Are Failing," Aug. 2014, *The Huffington Post*, http://www.huffingtonpost.com/hilary-gowins/chicago-public-schools-are-failing_b_5488973.html