Learning 2.0

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A lmost all the politics of education concerns rearranging adult power and privilege. Relatively little political energy is spent consciously designing a contemporary system of public education. That should change.

By focusing political energy on how students learn rather than the long list of hot button issues—tenure, teacher evaluation, charter schools, parent takeovers—it is possible to design a truly modern education system that is a worthy successor to the industrial-era public education structure that has persisted for a century.

In software nomenclature, we work with Learning 1.0, the first full version of mass public education designed to move most students from toddler through teenager. Designed in the early part of the 20th Century, Learning 1.0 involves all the parts of schooling that we consider normal and proper: students divided by grades, lessons by subjects, tests at the end of the year, and high school units collected toward graduation. But underneath it all are outdated assumptions about learning and how it is be produced.

Why, one might ask, should we be stuck in the eddies of an early 20th Century school design? The answer lies partly in culture and partly in politics.

In Learning 1.0, schooling and most other forms of formal learning are built on the design principle of acquisition and storage of information, only later acquiring the ability to analyze it, and, eventually, to use it. When Stanford University dean Ellwood Cubberley wrote the first widely used textbook on school administration in 1916, the acquisition and use of knowledge were proximate. Students left school early; most all by the end of high school, some by the end of third grade. The world of work and adulthood greeted them, however harshly. Indeed, in 1939, over 95 percent of the jobs in the automotive industry could be accomplished by someone with a primary school education.

Now, the lag between acquisition and use can be long. High school graduation is no longer the gateway to economic self-sufficiency. The pathway to being a medical doctor, a lawyer, or a professor can take a student well into their third decade before they practice what they prepared for. Deferred gratification, or at least incomplete selfhood, is one of formal education's fundamental lessons. (And we wonder why neurosis is rampant among the professional class.)

In this system, knowledge acquisition itself has value. As John Seely Brown notes, it's a Cartesian premise of "I think, therefore, I am." Pedagogy becomes the means to transfer knowledge through known and authoritative channels. Teachers teach. Students learn. Academic disciplines and courses of study organize knowledge into neat divisions. These become curriculum requirements that are counted and tested. Every strand of the public policy muscle surrounding these bones wants to strengthen these structures. The current system of tests and standards are the institution's biceps.

Learning 1.0 produces learning through batch processing and standardization. Age graded schooling, curriculum design, and a pedagogy aimed at the middle of a normal distribution curve assures that at least one-third of the students will be disengaged, bored, or utterly confused. In order to make batch processing and standardization work, schools developed an odd form of quasi-professionalism. Teachers were sent to college and education schools, and then they entered workplaces that featured industrial-style discipline and a hierarchical division of labor. Students were urged to grow up in classrooms that largely frowned on initiative.

While there can be debate about how well Learning 1.0 works, and for whom, the flaws in its design have become apparent, both financially and educationally.

Learning 1.0 has become fiscally unsustainable. Since 1964, most of the additions to the public education budget have been directed to programs outside the regular classroom, principally for special education and compensatory programs. Interventions that try to transform low performing schools have been expensive and for the most part not very productive. As trust in the capacity of public schools has decreased, external inspection, testing, and monitoring have increased along with the cost of these activities. Efforts to raise performance through high stakes tests and changes in governance have produced mixed results at best.

Learning 1.0 also relies on an old information economy, where increasingly large amounts of capital are necessary to create texts and curriculum, and where access to schools and classrooms requires lengthy and costly approval and purchase processes. Learning 1.0 largely ignores the emerging information technology built on peer production and collaboration by teachers and students.

Likewise, Learning 1.0 has become educationally questionable. Cognitive science tells us, for the most part, people do not learn through the acquisition and storage model; knowledge acquisition and practice are integrated. This was the case in traditional societies, through formal and informal apprenticeships, "working" the farm, or "learning the ropes" in a business. In these settings, young men and women acquired knowledge as they needed it, not for storage and recitation on tests followed by rapid forgetting. Urbanization and industrialization obsolesced the traditional learning-by-doing form of education. As children were withdrawn from the workplace, they also left behind the integration of learning and society, something that John Dewey recognized more than a century ago. Still, the Administrative Progressives, as they were called, were successful in establishing Learning 1.0, which appeared efficient and gained political support.

Now, we have the opportunity to redesign education by creating Learning 2.0, a more flexible, personalized, and experiential form of learning. The information processing capabilities of the Internet along with personal computers and other smart app electronics, have enhanced the capacity for "just in time learning": students are highly motivated to get the information they need to do the task that needs to be done. But even though it uses the Internet's network technology, Learning 2.0 results mainly from changing how people think about learning. More than the schools, it is people's heads that will need reprograming.

The Essence of Learning 2.0

Over the last two years, I have visited schools where people think outside the conventions of the acquisition and storage model, and where learning is organized in unconventional ways. Synthesizing these experiences and the rapidly growing research literature on learning, technology, and open education, it is possible to sketch the design of Learning 2.0:

1. A remix of acquisition and practice through project-based learning and other pedagogies that integrate head and hands. Integrating experience and academic standards creates multiple pathways through school without old-fashioned tracking, and integration often changes students' aspirations. Learning and doing motivates students and changes the flows of information.

2. An individual education plan for everyone. The official curriculum of most schools leaves large numbers of students either bored or bewildered, by both the speed at which knowledge is presented and the style of learning experienced. The system needs more variety in type and style of education, not less. Individualization and specialization of learning will allow different mixtures of technical, artistic, and conventionally academic education to co-exist and prosper. New technologies help, but individualization is as much about how humans rearrange their work as it is about access to software packages.

3. A redefinition of who is the worker in the education system. Historically, education reform has been built on getting adults to work harder hoping that this would make kids smarter. Instead, we need

to design and build learning experiences that are accessible directly by students and which better motivate them. Given data about standards and expectations and the expanding universe of educational experiences, students are capable of much more self-monitoring and direction than the current system expects or allows.

4. Unbundle the time spent learning and the assessment of competence. While the current practice of semester-long classes may endure for some time, the system needs to open the capacity for students to learn and be tested in different blocks of time, and to be certified as having learned. If there are productivity gains to be made in education, they will be made largely in shrinking the number of years and months it takes a student to move through high school and higher education and by reducing the necessity for remediation for students who simply needed longer to master a topic.

5. A redefinition of Basic Skills. The United States has been obsessed with higher standards in reading, math, and science. But standards and testing are dangerously narrowing learning. Learning to collaborate and to solve ill-defined problems are to the 21st Century what industrial discipline was to the last hundred years, according to those who have studied what employers and society need. Adoption of a common core of standards, to which 46 states have subscribed, is supposed to address these issues, but the danger remains that these standards—like the existing ones—will produce a longer list of atomized, and thus trivialized, skills.

The Politics of Learning 2.0

The contemporary politics of education cannot produce Learning 2.0. The problem is not—as many who call themselves "reformers" allege—with education interest groups. Politics is always full of interest groups, and some of the loudest reformers have big stakes in the reforms they advocate and are reaping generous personal benefits from them. The problem is that the system is focused on the wrong things. For most of the last four decades, the interest groups in public education have battled over mandates and regulations: increasingly fine-grained rules about who gets paid for what and what paperwork needs to be delivered as evidence of performance. Those same interests need to focus on changing the design of the system and increasing its

capacity. Consider three policy levers:

First, create and use the capacity to design learning using 21st Century information tools. Rather than designing "one best system" as the developers of the early 20th Century learning model sought to do, adopt the notion of continuous improvement and redesign, what Google calls "permanent Beta testing." Do not assume that any state or the country can move from early 20th Century learning to Learning 2.0 by adopting a new textbook series, by cabling schools, or selling them tablet computers by the truckload. Do not assume that "best practices" can be distilled into an educational pill for all to swallow. Rather, think of educational design as "many hands" distributed work, such as that which created the Linix operating system or the on-line Moodle classroom and lesson management system.

Public policy has created several education laboratories in which natural experiments of Learning 2.0 can take place. Charter schools, in their original intention, were supposed to be Petri dishes of innovations that would be transferred to district-run schools. Pilot schools, which are essentially in-district charters, are being spawned in the Los Angeles and Boston school districts and could work elsewhere as autonomous schools where teachers and educators remain district employees. They have a similar experimental capacity, and each goes through an explicit design phase before being approved. An older, largely abandoned, tradition of university-based laboratory schools could also become developers of Learning 2.0.

These schools should be treated as laboratories of learning, rather than experiments in governance. Those experiments should be explicit, a part of the design and application process for such schools. The requirement for pedagogical experimentation should apply particularly to those charters and other schools that are granted authority to work across school district boundaries. And the states should top-up charter school funding to allow careful documentation. Universities should be able to modify their teacher and administrator education programs to incorporate laboratory schools, and should get added support to do so.

Second, carefully deregulate. In many ways charter school law discriminates against existing school districts, making it easy for charters to be innovative while failing to scrape four decades of regulatory barnacles from the hull of district-run schools. The most important change involves moving toward a system where student progress can be based on mastery of a subject, rather than the number of days and minutes that a student's bottom was attached to a school seat. Some blending of attendance-based financing and achievement incentives would spur new forms of learning.

In addition, Learning 2.0 involves many changes in work rules. Blended learning or the organization of learning in ways other than traditional classes obsolesces standard class size limitations, indeed the whole definition of a class. Monitoring on-line instruction probably doesn't require the skill set of a certified teacher. We don't yet know all the contours of a teacher's job in this new environment; much less what's fair and just. We do know that getting from here to there will require a lot more flexibility and experimentation than the current system generally provides.

Either through legislation or teacher contract, states need to open up space for experiments within school districts. The unions resist these changes at their own peril. Historically, unions have not fared well when the basic technology of work changes. In the large Blue-politics states that have at least semi-friendly political environments, teacher unions have the chance to get ahead of the curve of teaching and learning innovation. If they fail, and most pedagogical innovation takes place outside the realm of district-run unionized teachers, the attractiveness of these district schools as workplaces is likely to diminish rapidly along with the size of the unionized sector of public education.

Third, invest in a learning infrastructure for students. Think of it as a combination of Facebook for school, the best computer game you ever saw, and a smart app for your mind. By thinking of the student as the end-user rather than designing educational products that will be attractive to a textbook adoption committee, the state can vastly open up learning to new participants, approaches, and ideas.

Consider the Kahn Academy for a moment, the singular creation of Sal Kahn using off-the-shelf software and retail technology. Its web site now contains over 2,700 math lessons (mostly) and gets 3.5 million visitors a month. Consider the burgeoning open-source courseware

movement first centered at MIT and Carnegie Mellon and now spread around the world with scores of additions each week.

The country or a state does not need to create a single learning utility, a power grid for learning. These are already springing up, and district schools and charters are testing and adopting them. Consider Moodle, the open-source classroom and lesson management system that is being used by school districts throughout California and by the California State University system. With tens of thousands of users, a wealth of adaptation of Moodle's program is already taking place.

Although there does not need to be a single learning utility to which all students and schools subscribe, there does need to be a network of learning utilities, the pedagogical and intellectual equivalent of common grazing land. The state has a very strong public interest in preserving the open-source commons and not outsourcing the intellectual and pedagogical core of its educational system.

Learning 2.0's commons-based, peer-to-peer collaboration is a powerful new production system that takes advantage of the Internet's technical and networking capacity. Its means of production is starkly different from that of the existing information industrial economy. In Learning 1.0, the long-standing practice of purchasing textbooks and educational materials from vendors morphed into buying programs of instruction and whole school designs. Education followed the mid-20th Century information economy model that applied to newspapers and television stations: scarce expertise and high fixed costs. Only a few people had the ability or the capital. Thus, the textbook and instructional materials oligopoly came into being, the educational equivalent of the "military-industrial complex" that Dwight Eisenhower warned us about. Learning 2.0 turns that older production system on its head.

It is particularly important to protect the commons as a way to develop and benefit from the knowledge of teachers. Proprietary software developers and the retooled textbook companies are intent on delivering complete integrated programs that are easy for school districts to adopt, but which lock them into the tender mercies of vendors. In contrast, most open-source learning systems and the platforms for developing applications are adaptable by teachers and often by students. This commons-based peer-to-peer production

system is an integral part of Learning 2.0, both its pedagogy and its economy.

Politics will have to sort this out. However, I believe that the existing interest groups are forming battle lines in the wrong places, primarily around the regulations regarding technology use. The more fundamental design decision concerns who builds Learning 2.0? At issue is whether teachers and school administrators are to be cast primarily as industrial era factory workers, whose job it is to oversee the flow of externally created learning technology; or are they primarily educational artisans and craft workers, whose job it is to choose among available tools, adapt them to specific needs, and build new ones?

Protecting the commons means public funding of computer access and software development. It means including time in teachers' workdays for their participation. It means developing technology that teachers and students actually want to use. It means incentivizing those teachers who are leaders in development. The state advances its interests by creating design standards, in the same way that Apple creates standards for the applications one can buy for its phones and tablet devices. By creating design standards and learning modules, the state will allow teachers and many others to combine bits and pieces of instruction and teaching ideas from different sources, and prevent the vendor's monopolistic practice of creating what is called coherence as a way of increasing market share.

This is the pathway to Learning 2.0.

That my dreams about public education can indeed come true, if schools, teachers and students are able to break out of the bureaucratic constraints that are smothering most public schools. There are small, integrated schools all over the country – many of them are charter schools, others are within districts and have negotiated the freedoms necessary to hire their own teachers and empower them to be co-creators of schools.

I have visited many schools in many states over the last three decades. I almost universally find that in small independent schools, whether privates, pilots, or public charters, the teachers have far more control of their work than teachers do under collective bargaining agreements.

I have seen more authentic assessment in such schools than in traditional district schools. I have been to evening exhibitions of student work in these schools where the building is packed with parents, grandparents, siblings and cousins because the students have told them all, "you must come see what I did." This is a form of transparency of what students and teachers are up to that gives new meaning to public participation. This is a different way to have strong community engagement – inviting the community into schools on a regular basis to see students present their work. Another powerful method is the internship, in which students engage in real work and real learning alongside a mentor in the community, and are not isolated from the adult world they are preparing to enter.

It is possible to have choice with diversity. A non-meritocratic, zip code based lottery randomly selects students in a way that insures diversity. Coupled with no ability grouping within the school, one can find schools that are both diverse – and integrated.

And now I work in a setting that has a Graduate School of Education fully immersed in our K- 12 public charter schools. Adult learning is integrated with student learning in a community of learners. It involves planning and executing differentiated instruction for diverse students in an integrated setting. It is founded on an integration of "head and hand" – a marriage of the pursuit of literacy and numeracy through a constructivist, applied, expeditionary pedagogy.

Now I see K-12 schools coupled with adult graduate school learning imbedded within a conceptual framework of inquiry and design, leadership, and reflective practice. This is the democratic schooling I have longed for. It can happen.