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THE SEEDS OF CHANGE

It doesn't look like a school. It's a small renovated warehouse in Oklahoma City's vibrant "Bricktown" district. The building's third floor can barely hold fifty people. Yet sixty thousand high school students took courses there during the 2006–07 school year. The school is called Advanced Academics, and it provides public education over the Internet to students in twenty-nine states, 140 school districts, and seven "virtual schools" from California to New Jersey and Alaska to Texas. Its students include a range of young people. Some have dropped out of their traditional high schools. Others simply prefer the flexibility of learning at their own pace at home. Still others attend conventional schools, but want Advanced Placement classes that their own schools cannot offer.¹

The warehouse is home to a top-notch team of technologists, as one might guess. They create the "platform" on which courses are delivered, tests administered and scored, and grades reported to state and local school systems. But mostly the warehouse is home to teachers—about thirty in all. For the education offered here is not strictly digital. Every course is supported by a teacher who is fully certified and even "highly qualified" under the federal government's No Child Left Behind accountability regulations.²

The teachers instruct their students as they work through digital lessons or complete assignments. Some of the instruction comes through written "instant messages"; some occurs via white-board correspondence, with both teacher and student sketching

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ideas on the same electronic surface; some involves Internet phone calls. Teachers also provide detailed comments on student essays and research papers, including electronic edits and suggestions for revisions. Because teachers are doing less direct instruction than in a traditional classroom, they have more time to respond to student questions and work. They typically support four or five students at a time from their computers, providing a level of individual attention they could never offer to a regular high school class. All of the teachers here have taught in traditional public schools, but see advantages for students in the differentiation afforded by online instruction.

Teachers like the informal, collegial atmosphere of the warehouse, where they easily interact all day long, sharing student challenges, and brainstorming strategies. They enjoy the flexible hours. The warehouse is buzzing with teaching from 7:00 AM to 11:00 PM. They can choose from a variety of hours, as students take their online courses around the clock, day and night. Some teachers work mornings and evenings so they can be at home with their young children in the afternoons. They are also given one day a week to work from home—but only one day, for the give-and-take of the warehouse helps teachers develop their online skills together.

School need not mean one teacher and twenty-five students in a series of classrooms. The little warehouse in Oklahoma City is one of many places around the country now offering instruction to students who are located long distances from the “school.” In 2006, the most recent year with authoritative data, nearly three-quarters of a million public school students completed courses online.³

Electronic instruction is changing conventional schoolhouses as well. In Dayton, Ohio, for example, students in two schools, Dayton Academy and Dayton View Academy, both K–8 charter schools, returned from summer vacation in 2007 to find their schools physically transformed.⁴ Large state-of-the-art learning

labs and media centers replaced traditional libraries and cramped computer labs. In their regular classrooms students found miniature laptops, packaged in kid-friendly hard plastic. On the laptops were “task managers” that showed each student the customized assignments to be carried out in the new instructional spaces. Teachers also had powerful new management tools. In the lab, they could view every student’s computer on a touch screen—revealing how quickly students were progressing through a lesson, whether they had a question, whether they were making too many mistakes. Teachers had new electronic assignment books and gradebooks to keep track of what their students were accomplishing electronically as well as traditionally.

In the Dayton Academies, students are spending forty-five minutes per day in grades K–5 and ninety minutes per day in grades 6–8 in the learning lab or media center. In both settings their instruction is in double-size classes of about sixty students, supported by a *single* classroom teacher—and, in the media center, by a library media specialist as well. The higher student-teacher ratios during the electronically supported instructional periods have enabled the schools to reduce the number of teachers they normally required. The staff savings have been used to raise the compensation of teachers and administrators, which in turn has enabled the schools to attract and retain stronger educators.

Dayton is a highly competitive charter school market. Half of all the sixty public schools are now charters, including twelve of the top twenty academic performers in the district.⁵ And because the Dayton Academies are schools of choice, with no guaranteed clientele, they need to perform at high levels in order to keep their students, families, and revenues. As charter schools, they have the freedom to do that in novel ways—and they have embraced technology with a passion, showing that even brick-and-mortar schools that look wholly conventional on the outside can be transformed on the inside. Teachers and students still gather together

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in buildings, face-to-face. But teaching is different. And learning is different.

America's Schools

These schools are exciting in their own right. What they are doing is innovative, and a striking departure from the traditional ways that American schools have long done their business. But they are also exciting because of what they represent. They are part of a movement, now in its early stages, to bring the revolution in information technology to public education, and in so doing, to harness its enormous potential for transforming—and improving—the way children learn, the way teachers teach, and the way schools are organized and operated.

What technology offers is profoundly important to the nation. America desperately needs to improve its public schools, and virtually everyone in a position of knowledge or public responsibility agrees that this is the case. The broad consensus among our policymakers—Democrat and Republican, liberal and conservative, from all corners of the country—is that the public schools are not delivering the goods, and that something serious needs to be done to turn the situation around.

This consensus is not new. It emerged in the wake of the most influential report ever issued on the quality of American education, *A Nation at Risk*, which argued in 1983 that the United States was facing “a rising tide of mediocrity” in its schools.⁶ The response at the time was remarkable: a frenzied push for reform that, within just a few years, left no state untouched. Even more remarkable, this frenzy has continued unabated ever since, to the point that education reform has become the new status quo. It is what the nation does, year after year, as a matter of routine. All this activity, however, has not led to a significant boost in school performance. The fact is, the reform process has never ended because the reforms have typically led to disappointment—and to demands for still more reforms. So here the nation is, after a

quarter century of perpetual effort and huge expense, and the state of public education remains troubling.

To be sure, there is still much to be proud of. America's public schools are a venerable democratic tradition. This country was the first in the world to value a free education for every child, regardless of economic circumstance or social status, and throughout the 1800s and most of the 1900s, it took major strides in getting children enrolled, keeping them enrolled through high school, socializing immigrant populations, promoting democratic principles, and sending growing numbers of students to college. It was the envy of the world, and deservedly so.⁷

Over the last half century, however, the schools have faced new and daunting challenges, driven in large measure by globalization, intense international competition, and a heightened emphasis on education—which scholars have shown to be a critical determinant of a nation's productivity and growth. In the modern world, economic prosperity cannot be secured through high school diplomas and basic skills, the nation's recipe for most of the twentieth century. It takes much more than that: analytic thinking, problem solving, independence, the ability to seek out and assimilate new knowledge.⁸

The public schools have not met this modern challenge—and the nation is still at risk. They have made some progress over the last few decades, especially among minorities, and that deserves to be recognized. But “some” progress is not nearly enough. Even today, regardless of the subject matter, the vast majority of America's students are not proficient by national standards. And test scores of minorities remain far below those of whites, producing a glaring achievement gap the schools have been unable to close. Meanwhile, American students continue to do unimpressively in tests of international achievement—and the older the students, the farther they fall behind their counterparts in many other developed countries.⁹

For the nation as well as for individual students, these gaps in educational performance matter more and more every day. The

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world is becoming more competitive, not less. The industries and jobs that promise prosperity in the future are increasingly dependent on higher levels of education. Nations such as India and China, which as recently as a decade ago were hardly factors in international competition, now compete aggressively and powerfully in economic markets, and their economies are growing at astronomical rates. Thomas Friedman recently detailed a world with a radically decentralized and newly leveled economic playing field—a world that, transformed by technological change, had essentially become “flat.”¹⁰ America’s ability to prosper in such a world, he argued, critically depends on its ability to educate its citizens more effectively.

No one disagrees with this assessment: the increasing value of education is recognized by one and all, regardless of ideology or party allegiance. But will America’s schools ever take the leap forward that a bright future so clearly demands? And will technology help it do that?

The Benefits of Technology

The schools we described above, one in Oklahoma and two in Ohio, are unknown to most Americans. And as innovations, they barely make a ripple in the vast sea that is the nation’s public school system. But they are harbingers of things to come.

Like so many other novelties that surround us these days, from iPods to YouTube to Wikipedia, they are expressions of a profound social force—the revolution in information technology—that while still in process, is fast generating one of the most important transformations in all of human history. Because we are all enmeshed in this revolution every day, most of us are naturally inclined to take it for granted as a normal part of our lives, and to have a difficult time appreciating the enormity of its longer-term implications. But the fact is, it is radically changing our world.

The information revolution has globalized the international economy, made communication and social networking—among

anyone, anywhere—virtually instantaneous and costless, put vast storehouses of information and research within reach of everyone on the planet, dramatically boosted the prospects of cooperation and collective action, internationalized the cultures of previously insulated nations, and in countless other ways transformed the fundamentals of human society. The new schools in Oklahoma and Ohio are an integral part of all this. They are among the first stirrings of a revolution in how children can learn and be educated.

The possibilities are exciting—and astounding. Even today, with educational technology in its earliest stages:

- Curricula can be customized to meet the learning styles and life situations of individual students, giving them productive alternatives to the boring standardization of traditional schooling.
- Education can be freed from geographic constraint: students and teachers do not have to meet in a building within a school within a district, but can be anywhere, doing their work at any time.
- Students can have more interaction with their teachers and with one another, including teachers and students who may be thousands of miles away or from different nations or cultures.
- Parents can readily be included in the communications loop and involved more actively in the education of their kids.
- Teachers can be freed from their tradition-bound classroom roles, employed in more differentiated and productive ways, and offered new career paths.
- Sophisticated data systems can put the spotlight on performance, make progress (or the lack of it) transparent to all concerned, and sharpen accountability.
- Schools can be operated at lower cost, relying more on technology (which is relatively cheap) and less on labor (which is relatively expensive).

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These advantages only begin to describe the educational promise of technology, and it is guaranteed to continue generating innovations at a breathtaking pace in the years ahead. The great power of technology is that no one really knows what it will produce or make possible in the future. Who would have thought, not so long ago, that such a thing as the Internet could even exist? Or that any child could use a laptop computer to gain access to massive compendiums of information on virtually any topic of interest? These are mind-blowing developments.

Although the advance of educational technology is still in its early stages, there can be little doubt that the information revolution has the capacity to revolutionize education. It could hardly be otherwise. Information and knowledge are absolutely fundamental to what education is all about—to what it means, in fact, for people to become educated—and it would be impossible for the information revolution to unfold and *not* have transformative implications for how children can be educated and how schools and teachers can more productively do their jobs.

But to say that technology is hugely beneficial and that it has the capacity to revolutionize American education does not mean that this revolution is actually going to happen.¹¹ That is the question at hand, the question this book is written to address. Will the promise of technology be realized in practice—and transform and improve the nation's public schools?

Political Resistance

The answer might seem obvious. Given the stagnation in performance that has long plagued American education, and given the long-standing inability of reform efforts to bring real improvement, the revolution in information technology clearly opens up exciting opportunities for revitalizing the education system and making it much more productive. Surely these opportunities will be greeted with open arms and put to creative use in promoting

innovation, driving change, and doing what is best for kids. Surely technology will triumph—and transform the education system.

But this line of argument is too easy. It focuses on the force for change—the benefits of technology—and there is much more to the story than that. Consider the plight of the Wisconsin Virtual Academy (WVA), a charter school operated by Wisconsin's Northern Ozaukee school district in cooperation with K12 Inc., a for-profit company. This school is one of the pioneers in bringing distance-learning technologies to public education: providing a rigorous, customized curriculum to students who “attend” from locations all over the state of Wisconsin, and whose needs were not being met by their own districts. Exciting, right? But also threatening to the districts that are losing students and resources to this innovative school. And threatening to the state teachers union, which, among other things, wants to protect the jobs of teachers in those districts, and does not like WVA's ability (facilitated by technology) to operate at lower teacher-student ratios. So the teachers union went to court to have WVA—and implicitly, all schools like it in the state of Wisconsin—put out of business, claiming that the school's mode of operation violates existing state education laws (which were written without distance learning in mind).

We'll continue this story in a later chapter. But what it represents is something quite fundamental. The force of technology is up against a counterforce: resistance by groups that do not want the traditional education system to change. Precisely because technology promises to transform the core components of schooling, it is inevitably disruptive to the jobs, routines, and resources of the people whose livelihoods derive from the existing system—and these people are represented by organizations that are extraordinarily powerful in politics. They are trying to use that power to prevent technology from transforming American education. And they will continue to do so in the future.

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This mobilization of power to block change is not unique to technology. It is, in microcosm, the saga of American education reform. America has been dissatisfied with the performance of its public schools for decades now, and has persistently tried to reform and improve them, but with disappointing results. A prime reason for all the disappointment is that reforms that really promise to change things are also threatening to groups with material stakes in the existing system—and throughout the reformist era, they have used their political power to prevent major change and preserve the status quo. This being so, the American education system faces much more than a performance problem. It also faces a *political* problem that, in the grander scheme of things, is more fundamental than the performance problem itself—because it prevents the performance problem from being seriously addressed and resolved.

The political problem that hampers American education is in fact a common problem throughout American government, and deeply rooted in the nature of things. For there are vested interests—groups with a material stake in the status quo—in *every* area of public policy, and they tend to be organized, powerful, and quite successful at using the political process to prevent reform within their own policy domains. Why is it so difficult for the United States to move toward a more rational and comprehensive health care system, and thus to resolve what most experts regard as a very serious performance problem? A prime reason is that insurance companies, pharmaceutical companies, and other businesses with a vested interest in the current health care system are threatened by any major overhaul, and they use their considerable power in the political process to block. Why does the nation continue to subsidize cotton, soybeans, and other crops—including tobacco, one of the most harmful substances in American society—when most experts agree that the subsidies make no good sense and the system should be radically changed? Here too, the main reason this problem can't be resolved is that farmers, tobacco companies, and related businesses with a vested interest in the system

are politically powerful, and they use their power to block any shift to a new policy.

To say that the deck is stacked against change in public education, then, is simply to recognize a basic reality of government and politics. A stacked deck is normal. And so is the expectation that, as technology generates new ideas and possibilities with great promise for American education, political power will be wielded to put a lid on what technology can really do—and to ensure that the revolution in information technology does *not* transform the traditional education system.

The Future

The nation's schools will only be transformed if this political resistance can somehow be overcome. This is a tall order, to say the least, for it reflects the very same political problem that education reforms of all types have been up against—and largely defeated by—for decades. Why should technology be any different? When all is said and done, this is the pivotal issue.

The central claim of our book is that technology is different. It is different, of course, because of its sheer enormity as a historic social force, and because of the great benefits it promises for learning and education. But these drivers of change are not enough to overcome the inevitable resistance. What sets technology apart from other sources of reform is that, as we will discuss in our final chapter, it also has a far-reaching capacity to *change politics*—and to eat away, relentlessly and effectively, at the political barriers that have long prevented reform. Technology, then, is a double-barreled agent of change. It generates the innovations that make change attractive, and at the same time it undermines the political resistance that would normally prevent change from happening. It pushes for change—and opens the political gates.

This is not to say that the triumph of technology will come easily, because it won't. There will be struggles and setbacks, and the process will take decades. But the forces of resistance will

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ultimately be overcome, leading to a transformation of the American school system. This will mean real improvement, and real benefits for the nation and its children. It will also mean something still more profound: the dawning of a new era in which politics is more open, productive ideas are more likely to flourish—and learning is liberated from the dead hand of the past.