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Next Generation Learning:

Can We Crack Four Problems to
Unleash Quality Education for All?

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We all know that every single child should receive a high-quality education. Not only is it the ticket to opportunity in America and around the world, but also research has shown clearly that there are life-limiting implications for children who are not adequately educated. We also know, however (in fact, we've known for decades), that in the United States, we're falling far short of this goal.² In the past 25 years, there have been many valiant efforts to reform our schools, and some small-scale successes, but it is clear that we need to move farther and faster. High School graduation rates are near-flat from 1976 to 2007. So are National Assessment of Educational Progress (NAEP) and SAT (formerly Scholastic Aptitude Test) scores. The picture gets even worse when you look at minorities' chances at succeeding in our country's education system: While African Americans make up 41 percent of the U.S. prison population, they make up only 12 percent of people living on college campuses.³ We need to transform the educational system in this country within a generation, ready or not. Our children's future and our global competitiveness demand nothing less.

Where to start? As we reflect on our work and research in education, we hypothesize that at least four systemic problems, which have not been widely addressed in reform, are inhibiting our ability to effect breakthrough change:

Problem #1: Lack of personalization of content

Students are sorted by age and progress based on the calendar (a concept known as "seat time") regardless of their personal needs and interests. As a result, many spend a lot of time unproductively.

Problem #2: Lack of appeal to different learning styles

Students are offered one mode of learning—the traditional classroom setting, with 25-30 students and one teacher—despite documented proof of the value of differentiation in learning.

Problem #3: Inability of teachers to play to their true strengths

The vast majority of teachers are expected to be "generalists" —instructing a classroom full of students en masse, sometimes on a wide variety of topics—despite the fact that individual teachers possess different strengths and specialties.

² "A Nation at Risk: The Imperative for Educational Reform." National Commission on Excellence in Education, April 1983.

³ Census Bureau 2006 data on characteristics of people living in adult correctional facilities, nursing homes and college housing. Note: This data does not take into account students who do not live on campus.

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Problem #4: Lack of effective reforms at a reasonable cost

Reforms and interventions to date have not been able to achieve quality results for students at a cost that permits them to expand their reach, and increase their impact, in tight budget environments.

We believe that a concerted effort to tackle each of these four problems could unleash great potential for cost-effective, widespread improvements in the way our students learn. In fact, in our research on emerging models of learning and schooling, we are seeing a small, but growing, number of innovations addressing these problems in ways that hold promise. Some were developed by traditional districts; others have been honed in nonprofit charter school organizations and for-profit entities, both inside and outside of the United States. All are relatively early-stage models serving relatively small student populations but are being designed to operate successfully on a much greater scale.

Sparking Effective Problem-Solving

The rest of this paper focuses on these high-potential innovations. Our intent however, is to generate ideas, not claim victory. We believe fervently that it will take sustained effort from many parties inside and outside of education to create and deploy high-quality methods and models that can be expanded across the nation's education system. The ultimate solutions won't come from a single source; they will come from an integrated effort by people who understand the ecosystem of education in the U.S.—the strengths, weaknesses, and potential contribution of all participants and stakeholders. Our hope is to spark truly effective problem-solving and encourage the kind of innovation that can result in widespread gains.

Promising Answer #1: Develop personalized learning pathways for all students

We know that spending time in a seat doesn't equal learning, so why don't we relax "seat time" as the primary indicator of a student's progression and use assessments to ensure that students meet certain standards within an acceptable, but more flexible, timeframe? For example, consider a student we'll call "Maria." What if Maria struggles in algebra and it takes her a year and a half to really grasp it, but geometry comes more easily for her? Why not let her spend a year and a half on algebra, and half a year on geometry?

This is just what the independent Swedish school network Kunskapsskolan does. Kunskapsskolan serves 10,000 students from all income levels and backgrounds across Sweden. Its students work with personal coaches to define learning goals and set individual plans that synch with their own learning styles and

strategies. Students choose the format that works best for them for each course, based on their interest and ability (e.g., lectures, workshops, seminars, laboratory experiments, etc.), and meet regularly with their coaches to review progress and adjust their plans accordingly. With a formal, tailored plan in place, they are free to pursue learning that simultaneously meets a common standard but acknowledges their individual interests, needs, and pace. Kunskapsskolan's model is underpinned by an online knowledge portal, accessible to teachers, parents and individual students. The portal sets out graduation standards, and shows student progress against these standards at any point in their studies. As Per Ledin, president of Kunskapsskolan, explained in an interview, "This model works well for all students—in fact, in some ways it most benefits those who are either most behind or most ahead."⁴

The work of AdvancePath Academics, based in Williamsburg, Virginia, offers another example of innovation that decouples "seat time" from student progress. AdvancePath has developed an educational program focused on students who face high barriers to high school graduation and are most likely to drop out. The organization partners with districts to operate its academies on a contract basis. The schools combine an online curriculum with a team-teaching model that runs in three "shifts" each day. Students work independently, following a pathway to graduation that focuses on the mastery of the curriculum, while teachers provide one-on-one and small-group instruction as needed.

Early results from AdvancePath's academies show dramatically lower dropout rates and increased post-secondary matriculation for students whom many would consider the hardest to serve. AdvancePath reports that 90 percent of its students either graduate from high school, transfer to another school to complete their studies or are on track to graduate.⁵ What's more, the organization delivers these results at a cost below the average daily expenditures per student of most districts. John Murray, founder and CEO, believes that AdvancePath's model has wide applicability: "We chose to work with the most challenging students and promised our district partners we would deliver results for students and save them money. We see no reason why we couldn't serve a broad range of students with our approach. Many students could accelerate their learning and districts could save money doing it."

Promising Answer #2: Open up a variety of avenues for student learning by offering options beyond the traditional lecture format

There is great evidence that one-on-one differentiation of instruction helps students progress—even in cases where the individual attention is given by a tutor, rather than a teacher. In addition, a meta-analysis

⁴ Interview with Per Ledin, president of Kunskapsskolan. August 19, 2009.

⁵ AdvancePath Academics Website (www.advancepath.com). Cited May 11, 2010.

conducted in 2009 by the U.S. Department of Education has found that online learning, when combined with live instruction (often referred to as a hybrid approach), can enable student learning more effectively than purely offline learning or online learning.⁶ Yet the most stable factor in the U.S. education system over the decades has been and remains the structure of the classroom. Picture the pastoral little red schoolhouse or today's standard classroom; you'll see a teacher standing in front of a group of 25-30 children. Even when we reduce class size at significant expense to make it easier for teachers to address individual student needs (Florida's class-size reduction initiative cost \$20 billion over eight years to implement, with an ongoing cost of \$4 billion per year⁷) we have seen no gains for students at most grade levels.⁸ What if our schools were set up to vary the mode of learning to meet student needs?

Consider New York City's School of One pilot program, which offers a range of learning modes including group and small-group instruction, one-on-one teaching, online instruction, and other approaches designed to meet the specific needs of each student. The program uses technology to match students with specific lessons and modes; each student has a daily "playlist" that changes based on the progress they made the day before through very quick pre- and post-assessments. An independent study of the organization's initial summer pilot (run in 2009) found strong performance gains for participating students; as a result, School of One will be deployed in three elementary schools for the 2010-2011 school year. As Joel Klein, chancellor of the New York City Department of Education, said at the announcement of that deployment on March 15, 2010: "I'm proud that we've put a record number of students on the path to graduation, but we must also ensure our classrooms are preparing all of our students for success in the real world. As part of this effort, we must explore new ways to deliver instruction and leverage technology to improve learning."⁹

⁶ Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. (2009). "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies." U.S. Department of Education.

⁷ Matthew M. Chingos (2010), "The Impact of a Universal Class-Size Reduction Policy: Evidence from Florida's Statewide Mandate," Program on Education Policy and Governance Working Papers Series, April 2010, p. 4; Hopkins, G. (2004). The Debate Over Class Size (Part 2). *Education World*. Retrieved January 19, 2010, from http://www.educationworld.com/a_issues/issues/issues025.shtml.

⁸ Much of the investment in reducing class size was based solely on research on grades K-3 and only when class size was reduced to 12-17 students (which most initiatives are not doing). Furthermore, there is scant evidence for the effectiveness of class -size reduction in middle and high schools. See Mosteller 1995; Aaronson et al. 2003; Hanushek, Rivkin, Kain 2005; Clotfelter, Ladd, and Vigdor 2007; Woessmann 2006/2007; Gustafsson 2006; Ludwig and Bassi 1999.

⁹ New York City DOE press release, March 15, 2010 <http://schools.nyc.gov/NR/rdonlyres/DBA57EE3-65F5-4F3B-88E6-E471600C8A67/79453/PressReleaseN63200910SchoolofOne31510.doc>

Florida Virtual School (FLVS), the nation's first statewide, Internet-based public school, provides another example. FLVS works with school districts to serve K-12 students in Florida and across the country with online classes. From 2004-2006, FLVS students consistently outperformed non-FLVS students in reading and math standardized tests. In addition, FLVS middle-school students showed consistent improvement on the Florida Comprehensive Assessment Test (FCAT).¹⁰ Importantly, FLVS is designed to meet all students where they are; 40 percent of its students are working towards credit recovery.

Originally focused exclusively on online learning, FLVS is now moving to create curriculum that deepens the integration between completely virtual online learning and in-person instruction, redefining the classroom.¹¹ As Holly Sagues, chief strategist and policy officer of FLVS, explained: "We are working to offer courses that blend both online and face-to-face instruction. Our strategy is to create the most personalized, individualized learning environment for students that we can. Across Florida and the nation, students are finding success in totally virtual environments, partially virtual environments, and within traditional classrooms, all engaged in the same FLVS curriculum, and, we envision one day, all part of the same class."¹²

As noted, the traditional classroom structure still dominates the educational landscape in the United States. But current trends are encouraging. Forty-four states offered significant full-time or supplemental online learning options (many through state-run virtual schools)¹³ in 2009. An estimated 1,030,000 K-12 students engaged in online courses in 2007-2008, a 47 percent increase in merely two years.¹⁴ System-wide change on this front may not be as distant as it seemed even a few years ago, as more schools test the waters of hybrid education.

Promising Answer #3: Deploy teachers in ways that leverage their individual strengths and increase their effectiveness

Research has consistently shown that the single most important factor in student learning is the quality of the teacher. However, studies also show that not many teachers are able to advance their classes by a

¹⁰ "Final Report: A Comprehensive Assessment of Florida Virtual Schools." Florida TaxWatch Center for Educational Performance and Accountability. November 5, 2007.

¹¹ Interview with Holly Sagues. December 14, 2009.

¹² Interview with Holly Sagues. December 14, 2009.

¹³ Watson, J., Gemin, B., and Ryan, J. (2008). "Keeping Pace with K – 12 Online Learning: A Review of State-Level Policy and Practice." NACOL.

¹⁴ Picciano, A.G., and Seaman, J. (2009). "K–12 Online Learning: A 2008 Follow-up of the Survey of U.S. School District Administrators" Sloan Consortium.

full year of proficiency over the course of a single school year. For example, in New York City, only 12 percent of 8th grade math teachers (and six percent of reading teachers) were able to get one year of growth from 80 percent of their students in a single school year.¹⁵ What if we were able to leverage teachers' individual strengths to drive greater effectiveness across the board?

The Generation Schools Network, currently operating one district-run public high school in New York City, offers a compelling example of how this might be accomplished. Founder Furman Brown and his team have revamped the traditional approach to deploying teachers, building an environment in which teachers have time to collaborate with and support one another, and students have more time to learn. At Brooklyn Generation School, teachers teach three classes and have two hours of planning time with their colleagues each day. Their "student load" for some classes is much lower than average, with as few as 14 students per class. What's more, they receive more than 20 days of training each year.

The school day, and school year, is longer for students (the Generation model increases learning time by up to 30 percent). But teachers work the same amount of time each year as do their peers at other public schools, due to staggered vacation time and daily schedules, and also due to the fact that nearly 90 percent of the organization's full-time professional staff teach, and most staff have flexible, dual roles.¹⁶ Generation Schools works with the American Federation of Teachers in New York City, and has a union contract with the same overall budget as other schools of comparable size.

It took years for the organization to fully implement its model; making the model work has required both creativity and persistence. Importantly, though, Generation Schools is showing real results in terms of student achievement. In the 11th grade New York State Regents (exams given statewide), Generation Schools students outperformed both the city average and comparable schools in math, science and global studies. In addition, more Generation Schools students are on track to graduate from high school (as evidenced by high school credits) than the city average and their peers at comparable schools. All of this happens with a school population of which 84 percent of students qualify for free- and reduced lunch, and a class in which 82 percent of students entering 9th grade were performing behind or significantly behind grade level.¹⁷

¹⁵ Source: New York City Department of Education, Joel Rose.

¹⁶ Sawchuk, Stephen. "NYC School Built Around Unorthodox Use of Time." Education Week. March 10, 2010. Interview with Furman Brown, Fall 2009.

¹⁷ "Generation Schools: Whole-School and Systemic Innovation." A report by Generation Schools shared with Bridgespan 1/14/10.

Generation Schools is an exemplar, but other schools and colleges are also purposefully creating differentiated roles for teachers to enhance student learning; their experiences may also hold lessons for other educators. Carnegie Mellon University's Open Learning Initiative for college students, for example, has helped teachers use online offerings to supplement their traditional approach to teaching and explore new roles as course designers, lecturers, or in-class facilitators. In a K-12 scenario, roles redesigned along these lines could help teachers differentiate their own instruction effectively. Separately, this sort of approach might also allow the educational system to address another pressing issue in education—the looming teacher shortage caused by baby boomers' retirements—by creating flexible, part-time roles that utilize each teacher's distinct expertise.

Promising Answer #4: Create solutions that are cost-competitive with the existing system

Underpinning all of the challenges in education is the challenge of operating in a cost-constrained fiscal environment. Innovation in education has not traditionally been sensitive to cost constraints, and the wheels of change have long been greased with new money. The current fiscal crisis and the long-term outlook for public spending, however, present a new reality for education; we are going to need to figure out how to create new models whose costs come in at or lower than the current costs of educating students.

The fact that many countries spend less than we do per capita on education and get better results demonstrates how far behind the U.S. is on this dimension, but it also shows that meeting the challenge is possible. The good news is that an increasing number of innovators see opportunity in the current situation, and are committed to embracing it. As John Murray of AdvancePath Academics told us, "There is growing receptivity among districts to try out an innovation that can bring costs down. For us, this is an opportunity to prove the effectiveness of our academies and create a partnership that does right by the students and saves the district resources in a tough environment."

Rocketship Education offers a good example of purposeful innovation with limited means. Rocketship operates two elementary schools in San Jose, CA with plans to grow significantly over the coming years. California is in a terrible fiscal situation; the state ranks 43rd in the country in terms of spending per pupil¹⁸ and education has borne the brunt of the current financial crisis, with greater than 10 percent cuts over the past year alone. Rocketship manages to operate effectively within these constraints by creating a period each day during which students pursue online learning under the supervision of a trained adult

¹⁸ Education Week. "Quality Counts at 10: A Decade of Standard-Based Education Editorial Projects in Education Research Center, 2006." Adjusted Census Bureau spend per pupil by cost-of-living index.

(though not with a certified teacher). The schools redeploy the money saved to hire specialist instructors in math and English language arts to ensure all students have the benefit of highly effective teaching in these core subjects and that those students in need of additional support get it. The approach works: Rocketship's 2009 state Academic Performance Index (API) scores made its schools the highest performing low-income elementary schools in San Jose and Santa Clara County, and 3rd in California. Rocketship also ranked 5th out of all 45 schools in San Jose Unified school district. The four schools with higher API scores serve few low-income students; all having fewer than 10 percent low-income students, as compared to Rocketship's 78 percent.¹⁹

Rocketship, Generation Schools and AdvancePath Academics, along with state virtual schools, are among the organizations we identified that have been able to implement a variety of innovative solutions—dealing with a range of issues—with budgets that are at or below prevailing public budgets. Their stories demonstrate that a variety of scalable models that increase quality through differentiated instruction and personalization can be delivered at the same cost or less than the existing systems today. (Our own analysis also supports this theory; Appendix A: “The economics of next-generation learning approaches” provides detail.)

What It Will Take to Get from Innovation to Transformation

In order to conquer these four central problems and by consequence transform students' learning experience, we need to continue to expand on the work of organizations such as Rocketship Education, Florida Virtual Schools, Generation Schools, AdvancePath and others. Education entrepreneurs are central to the hard work ahead. Another generation of dedicated, creative and dogged leaders, like those who created leading organizations like Teach for America, KIPP, YES Prep, and Wireless Generation, and those who lead states and districts that are making change happen, are rising; they need support. They need capital to validate and scale their models—models we believe are likely to be more easily scalable from the start, given their cost-competitiveness and technological foundations. They need help from policy innovators and advocates to break down barriers that inhibit progress. They need partners who help to integrate their work with others, evaluate it and support continuous improvement. Most importantly, they need parents, teachers and students to try out promising models and demand access to the best ones.

¹⁹ www.rsed.org, “Rocketship Education 2009 Academic Results” press release.

Therein exists a great opportunity for philanthropy, which can play a catalytic role by creating funding programs that invest in high-reward, high-risk innovations, betting on a few big successes even if a number of investments fail. Progressively, philanthropies should facilitate the emergence of private and public capital to fund promising models. The private capital market is much deeper than the philanthropic market, and philanthropy might help shape markets in which program effectiveness correlates with profit potential. Philanthropies should also support policy advocacy that focuses on improved procurement processes in the public sector so that it would be highly effective in the here and now. Such work might involve investment in information-sharing services that increase transparency of quality and cost of products and services, so that district and school leaders can make better choices.

District and school leaders can be a major source of innovation and purposeful change; unfortunately, they also can create significant obstacles to change. Most of the innovations we've discussed in this article are happening in a few select school systems that have either generated an entrepreneurial spirit in-house or sought out partnerships for that purpose. In order for successful innovations to reach the millions of students who need them, the vast majority of school leaders need to adapt that entrepreneurial outlook, and shift the focus of their purchasing decisions from cost to cost effectiveness, and from seat time to real learning.

They will have to acquire more innovation than they can build. Very few systems, if any, have the depth of expertise to make better solutions in-house than a specialist organization can. Some systems, however, may be able to develop solutions in focused areas that they could then scale statewide or nationally—creating a business opportunity in the process. Overall, our sense is that an orientation to “buying” based on effectiveness would unleash a huge innovation ecosystem in which entrepreneurs and established organizations could invest to develop truly breakthrough products and services at a scale that has not been viable to date.

Education policymakers also have a critical role to play, in creating guidelines and procedures that focus on outcomes rather than prescriptions and on cost effectiveness rather than cost alone. Policymakers hold the power to reshape the playing field so that public funding flows to the most effective solutions and all activities are rigorously evaluated, with clear, open reporting. In the near term, policymakers should move swiftly to create waiver programs that allow for innovations to be piloted and provide innovation program funding (as is the case with the Department of Education’s “Investing in Innovation,” or i3, Fund) to catalyze new work.

People currently involved in the education field are not the only ones who could and should significantly influence the next generation of education in America; some of the most important innovations yet to surface may come from students, from parents, or from wholly outside of the field. We know that the transformation will not happen overnight; even the most promising solutions that have generated the greatest advances in student achievement require more than a simple flip of the switch to introduce, gain acceptance, and integrate system-wide. But momentum is building; a growing group of dedicated leaders are committed to providing our children with the skills and capabilities to thrive in future generations. We need to expand this group and support them in their efforts to crack tough problems and unleash new approaches that will provide *all* students with a great education.

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Appendix A

The Economics of Next-Generation Learning Approaches

Armed with our knowledge of existing programs, Bridgespan researchers conducted a modeling exercise to look at how one might redesign schooling to create personalized learning pathways, and what the cost implications would be. We aimed to create an environment that provides personalization and increased differentiation in the form of one-on-one and small-group instruction for students who need it. The point of the analysis was to open the aperture on how schools deploy their limited resources for maximum student effectiveness. We worked with three variables (note that these are tied to the other three solutions, besides cost effectiveness, that we believe are critical):

- The mode of learning—large group instruction, independent online work, 1-on-1, etc.
- The size of groups in instructional settings
- The type of human resource used—experienced teacher, tutor, non-instructional supervisor

A conventional approach to this problem would be to create a one-on-one period where students would receive the help they need. However, if every student received one period a day of individual instruction (which the evidence shows would likely be valuable), the cost of instruction would skyrocket to the tune of an additional \$4,000 per student per year or \$120 billion for the nation's 30 million students.

We asked, instead: What if the deployment of people and the mode of instruction were aligned to provide personalization *at the same cost as today's system*? One approach we modeled, which was the same cost as existing school approaches, incorporated a high degree of online learning into the school environment. Students would spend half their time learning and interacting online with facilitator teachers or tutors available for support in-person or remotely. They would also have one-on-one and small seminar groups with specialist teachers to work on specific need areas. A second plausible approach we modeled divided up the modes of learning by increasing class sizes for large group instruction to 50 or 60 in order to provide for more one-on-one and small-group time.

Through this financial modeling exercise, we found a range of combinations that would both enhance personalization and be cost effective. On the flip side, we also found that tinkering on the margins—adding one block of time of online learning or one block of small group instruction—wasn't feasible. It was only in more holistically reconstructing the school instructional model that we found approaches that were cost-effective. Interestingly, some of these have strong resemblances to the examples cited, such as Generation Schools and Kunskapsskolan.