

## The Leaky Pipeline: IT Can Help

For the United States, the educational dropout rate is one of the nation's greatest tragedies. It represents a calamity not only for the individual students but also for communities and the nation as a whole. Society pays the price for this leaky educational pipeline in a myriad of ways: higher crime rates, higher unemployment, higher government expenditures on social service needs, lower civic involvement—the list goes on and on. Meanwhile, evidence is mounting that educational attainment is the biggest predictor of success for cities and metropolitan areas. The more educated a region's population, the more robust its economy will be. CEOs for Cities has calculated the dollar value of moving more people up the educational pipeline and graduating them from college. In the Cincinnati region, for example, increasing college attainment by one percentage point would produce a “Talent Dividend” of \$1.6 billion in increased per capita income each year.<sup>1</sup>

In the meantime, the nation is missing out on possible opportunities for growth as many remain in a general state of denial (or acceptance) of graduation rates. According to conventional wisdom, high school graduation rates stand at about 85 percent. But studies show that in most high schools, the graduation rate is closer to 70 percent. Even worse, *Cities in Crisis* indicates that in large urban school districts, the high school graduation rate tends to be about 15 to 20 percentage points lower. In some school districts in major cities, only three or four students out of ten make it to high school graduation.<sup>2</sup>

The teacher dropout rate is almost as compelling and shocking as the student dropout rate. In the course of the first five years of teaching, half of teachers quit; in urban settings, half quit within their first

three years of teaching.<sup>3</sup> Does that matter? It certainly does. Low-performing schools rarely close the student achievement gap because they never close the teacher quality gap. They are consistently rebuilding their staff. An inordinate amount of capital, both human and financial, is consumed by the constant process of hiring and replacing teachers who leave before they have matured or attained the ability to create a successful learning culture for their students. In fact, the total cost of teacher turnover in the Chicago Public Schools is estimated at over \$86 million a year.<sup>4</sup>

Some might feel inclined to throw up their hands and proclaim these problems too overwhelming to solve, but I believe that the higher education community has a responsibility to take action. That is, after all, what we're here for: to innovate, lead the way, and serve our society. And IT can help. Here is a dream, one developed by the National Science Foundation Task Force on Cyber Learning: “Imagine a high school student in the year 2015. She has grown up in a world where learning is as accessible through technologies at home as it is in the classroom, and digital content is as real to her as paper, lab equipment, and textbooks. At school, she and her classmates engage in creative problem-solving activities by manipulating simulations in a virtual laboratory or by downloading and analyzing visualizations of real-time data from remote sensors. Away from the classroom, she has seamless access to school materials and homework assignments using inexpensive mobile technologies. She continues to collaborate with her classmates in virtual environments that allow not only social interaction with each other but also rich connections with the wealth of supplementary content. Her teacher can track her progress over the course of a lesson plan and compare

her performance across a lifelong ‘digital portfolio,’ making note of areas that need additional attention through personalized assignments and alerting parents to specific concerns.”<sup>5</sup> This is already a reality for some, but not for many. Thus, we need a vision of a 21st-century teaching and learning environment, one that will help to plug the leaky pipeline for both students and teachers.

One of the great challenges in the U.S. educational system is that education remains divided into a vast array of parts: pre-school, K-12, higher education, adult education, lifelong learning, vocational education, remedial education, teacher preparation, standards and accountability, school funding and infrastructure, mentoring and tutoring. To enhance collaboration across these subdivided parts and improve the caliber and quality of students' learning experience, the University of Cincinnati has joined forces with other four- and two-year colleges, school districts, community organizations, civic leaders, and businesspeople. The participants have formed a systemic partnership—Strive: A Cincinnati-Northern Kentucky Birth to Career Collaborative—to work together on the solution. The goals of Strive are for children to be prepared for school, be supported in and out of school, succeed academically throughout critical stages in their life, enroll in college, graduate from college, and successfully enter careers. U.S. President Barack Obama, in an address to a joint session of Congress earlier this year, echoed this concept: “It will be the goal of this administration to ensure that every child has access to a complete and competitive education—from the day they are born to the day they begin a career. That is a promise we have to make to the children of America.”<sup>6</sup>

One dream at Strive is the idea of a “virtual backpack.” Imagine the possibilities if every student in the United States carried a virtual backpack with statistics on his or her entire educational history? The data, traveling with students as they move from school to school, could be used to update parents on their children’s learning progress, register students in school, or provide information when students have moved to a new city or entered college. Educators and researchers could plumb the backpack for data to figure out how to target instruction more effectively or to determine which educational interventions work and which don’t.

Strive has had the good fortune of partnering with GE Aviation, which follows the Six Sigma principles. Although assembling a jet differs greatly from preparing a child for kindergarten, Strive has nonetheless adapted the Six Sigma principles. The idea is that data and metrics are needed in order to determine whether interventions undertaken with kids actually work. Here is another area where IT can help—in collecting and analyzing the data. For example, another dream is a scannable “ATM card” for children, which—whether distributed in the delivery room or shortly thereafter—would hold data for the virtual backpack. These cards would allow early childhood care providers to track the time and attendance of students so that caregivers can spend more time on instruction.

Inquiry-based collaborative approaches to learning, which benefit both individual and collective knowledge growth, can help more students succeed academically.<sup>8</sup> As schools explore and implement strategies to engage students in the ever-changing world, inquiry-based learning—largely based on IT—is destined to serve a powerful combination that can help retain more students in high school and in college. The New Technology High School (NTHS) Network ([http://www.newtechfoundation.org/initiatives\\_network.html](http://www.newtechfoundation.org/initiatives_network.html)), comprising forty schools across the United States, uses project-based learning instructional strategies and is a model to watch.

As a university president who is soon to become a system chancellor, I believe that communities will increasingly call

on university presidents and chancellors to be the conveners of this educational dialogue. And I believe that IT can assist these presidents and chancellors in becoming the leaders they need to be. Although the U.S. educational pipeline is indeed leaky, IT can help leaders to plug the holes and prevent dropouts by sharing practices around information, data collection, and innovative teaching and learning.

**Notes**

1. CEOs for Cities, with support from the Lumina Foundation for Education, “CityDividends: Gains from Improving Metropolitan Performance,” [http://www.ceosforcities.org/files/City\\_DividendsFINAL.pdf](http://www.ceosforcities.org/files/City_DividendsFINAL.pdf); for the Cincinnati figures, see “Cincinnati Talent Dividend,” CEOs for Cities, <http://www.ceosforcities.org/news/entry/2188#Cincy>.
2. Nathan Thornburgh, “Dropout Nation,” *Time*, April 9, 2006, <http://www.time.com/time/magazine/article/0,9171,1181646-1,00.html>; Christopher B. Swanson, *Cities in Crisis: A Special Analytic Report on High School Graduation* (Washington, D.C.: America’s Promise Alliance, 2008); Christopher B. Swanson, *Cities in Crisis 2009: Closing the Graduation Gap* (Bethesda, Md.: Editorial Projects in Education, 2009).
3. R. M. Ingersoll, “Teacher Turnover and Teacher Shortages: An Organizational Analysis,” *American Education Research Journal*, vol. 38, no. 3 (2001).
4. Gary Barnes, Edward Crowe, and Benjamin Schaefer, *The Cost of Teacher Turnover in Five School Districts: A Pilot Study* (Washington, D.C.: National Commission on Teaching and America’s Future, 2007), p. 5, [http://www.nctaf.org/resources/demonstration\\_projects/turnover/documents/CTTFullReportfinal.pdf](http://www.nctaf.org/resources/demonstration_projects/turnover/documents/CTTFullReportfinal.pdf).
5. Katherine Lawrence, Executive Summary to National Science Foundation (NSF) Task Force on Cyberlearning, *Fostering Learning in the Networked World: The Cyberlearning Opportunity and Challenge*, <http://www.nsf.gov/pubs/2008/nsfo8204/nsfo8204.pdf>.
6. “Transcript: Obama’s Speech to Congress,” February 24, 2009, *CBSNews.com*, <http://www.cbsnews.com/stories/2009/02/24/politics/main4826494.shtml>.
7. See Margaret Raymond, “The Student Data Backpack,” in Marci Kanstoroom and Eric C. Osberg, eds., *A Byte at the Apple: Rethinking Education Data for the Post-NCLB Era* (Washington, D.C.: Thomas B. Fordham Institute, 2008), pp. 142–57.
8. Brigid Barron and Linda Darling-Hammond, “Teaching for Meaningful Learning: A Review of Research on Inquiry-Based and Cooperative Learning,” *Edutopia*, <http://www.edutopia.org/files/existing/pdfs/edutopia-teaching-for-meaningful-learning.pdf>, excerpted from Linda Darling-Hammond et al., *Powerful Learning: What We Know about Teaching for Understanding* (San Francisco: Jossey-Bass, 2008).

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