



## E-Rate, Education Technology, and School Reform

By Frederick M. Hess, Bror Saxberg, and Taryn Hochleitner

*Over the past two decades, US presidents, governors, CEOs, and journalists have trumpeted technology's power to transform schools. Yet technology never seems to deliver on its promise to be an education game-changer. This is because technology cannot drive meaningful change by itself—it must be coupled with a commitment by school leaders to reinvent teaching and learning. Policymakers and reformers should take cues from school systems such as Mooresville Graded School District in North Carolina, which successfully employs technology to make learning solutions more affordable, reliable, available, customizable, and data-rich. Specifically, state legislatures should encourage technology-enabled reinvention of schools by loosening seat-time requirements and online-learning restrictions, revisiting school spending rules, relaxing teacher evaluation policies, and supporting innovative school models.*

On June 6, 2013, from a podium set before smiling students at a middle school in Mooresville, North Carolina, President Obama said:

We can't be stuck in the 19th century when we're living in a 21st century economy. And that's why, today, we're going to take a new step to make sure that virtually every child in America's classrooms has access to the fastest Internet and the most cutting-edge learning tools. And that step will better prepare our children for the jobs and challenges of the future.<sup>1</sup>

His proposal, dubbed "ConnectED," seeks to provide high-speed Internet to 99 percent of America's students by 2017.<sup>2</sup>

Obama's talking points are familiar. Promises that technology can help remake schools have been sounded by Bill Clinton and George W. Bush, as well as a slew of governors, journalists,

and CEOs across the past two decades. At the moment, federal policymakers are focused on the E-Rate program. Created by the Telecommunications Act of 1996, E-Rate (an informal name for the Universal Service Administrative Company's Schools and Libraries Program) is a discount on telecommunications services for schools and

### Key points in this Outlook:

- Technology's most significant contribution to schooling is its ability to make good learning solutions more affordable, reliable, available, customizable, and data-rich.
- North Carolina's Mooresville Graded School District provides a blueprint for how technology can be used to reinvent the classroom in ways that improve learning.
- Steps policymakers can take to allow for technology-enabled reinvention include loosening seat-time requirements, revisiting procurement rules, and considering more flexible teacher evaluation policies.

Frederick M. Hess is (rhess@aei.org) is the director of education policy studies at AEI, Bror Saxberg (bror.saxberg@kaplan.com) is chief learning officer at Kaplan Inc., and Taryn Hochleitner (taryn.hochleitner@aei.org) is a research associate at AEI.

libraries. In a complex process overseen by the Federal Communications Commission (FCC), all public and most nonprofit private schools and libraries are eligible to apply for discounts on particular services and components such as Internet or internal routers.

There is widespread agreement in Washington that the 17-year-old E-Rate program needs fixing. Its flaws include an arduous application process and distribution rules that result in abused and wasted funds, uncertainty, and difficulties obtaining certain services. One month after Obama's ConnectED address, the three sitting FCC commissioners—two Democrats and one Republican—voted unanimously to open a period of proposed rulemaking, calling for public comments on how to “modernize” E-Rate. Elected officials and education advocates are hopeful that fixing and updating the program will help accomplish Obama's goal of providing more broadband for more students, which they think will ultimately make a big difference for learning.

---

While educational technology always seems to be ripe with promise, experiences using new technologies in classrooms over the course of the past century or so have left educators exasperated and wary.

---

This justified enthusiasm for E-Rate reform should be tempered with some humility about the road ahead. It would only be too easy for policymakers to focus on the relatively uncontroversial task of reforming E-Rate and fall into the facile trap of suggesting that better Internet access and technology will by themselves deliver better learning. The truth is, as two of us argue in our new book *Breakthrough Leadership in the Digital Age*, technology cannot and will not drive meaningful change by itself.<sup>3</sup> After all, while educational technology always seems to be ripe with promise, experiences using new technologies in classrooms over the course of the past century or so have left educators exasperated and wary. Decade after decade, disappointing initiatives have soaked up time, energy, and money while showing little evidence that new tools actually deliver on their promise to make a difference for learning.

However, if technology is used as a tool for smart redesigns meant to give students a better learning experience, we are firmly convinced that it can have a profound

impact. Policymakers and reformers have a vital role to play in allowing that to happen, as they will determine whether school and system leaders are free to use technology to rethink schooling in ways that actually improve learning, and whether those leaders are inclined to do so.

## The World's Most Transformative Education Technology

While the history of education technology is replete with disappointment, we can think of at least one technology that irrevocably and universally transformed teaching and learning. Originally greeted by educators with skepticism, it has gone on to help redefine the very fabric of schooling.

We are talking about your familiar, friendly book. Indeed, it is now so familiar that it is hard to imagine that it hasn't always been with us. But it hasn't.

How does the book inform our thinking about 21st-century education technology? After Johannes Gutenberg invented the printing press six centuries ago, the book revolutionized the provision of information, letting students read and reread text as often as they needed, ensuring they had access to information in the teacher's absence. This made it easier to grasp and apply new ideas.

Before books, any student or class could learn only as much as the teacher could convey. The book made high-quality content readily available to anyone with a copy, at any time, day or night. As Steven Fischer explains in *A History of Writing*, “Printing changed society in a fundamental way. By making almost unlimited copies of identical texts available by mechanical (now electronic) means, it brought society from limited access to knowledge to almost unlimited access to knowledge.”<sup>4</sup> No longer dependent on what one teacher knew, a student could read a “lecture” penned by the foremost authority on a given question.

This allowed students to master content by perusing their books, freeing the teacher to focus more on tasks such as explaining or mentoring, which go beyond just conveying knowledge. Books provided the first opportunity to “flip” a classroom, an in-vogue term that means students pick up information outside school, with class time used for things other than mere information conveyance, such as coaching, problem-solving, and story-telling. “Flip” currently applies to nonprint media, but books were also intended to flip the classroom through reading, allowing students to absorb new material even when a teacher was not lecturing.

Today, centuries after the invention of the printing press, it is hard to imagine schools without books. In a typical classroom, the shape of a teacher's job is wrapped around the textbook. Teachers expect students to read textbook chapters at home, allowing classroom instruction to emphasize understanding and exploration. Teachers also ask high-school students to read novels so they can discuss them in class. Until very recently, when such activities started to migrate online, students were referred to books for additional explanation or when pursuing research. This allowed teachers, at least in theory, to focus in-class energy on explaining, mentoring, coaching, and all the rest, and to reduce time spent providing facts or reciting content.

In short, books did some of the same things that we excitedly attribute to online learning today—they simply did them in a much more limited, less agile, and less customizable fashion.

## Technology Makes It Possible to Enhance Good Solutions

Books are a learning technology, even without electricity or on-off switches. And like all technologies, they can be used in ways that are more or less likely to improve teaching and learning.

---

Adaptive, intelligent tutoring systems are expensive to build—but they look pretty reasonable alongside the labor costs and practical challenges of two-to-one tutoring.

---

As FCC Commissioner Ajit Pai has explained, wisely cautioning against some of President Obama's pie-in-the-sky language, "Using technology to bring learning to life for children isn't new. When I was in elementary school, for example, we used to watch a lot of filmstrips. And I still remember doing research on microfiche in high school! But Internet access provides a quicker and easier way for teachers to introduce students to an amazing array of materials."<sup>5</sup>

Pai makes two important points: First, if we keep in mind the book, pencil, chalkboard, filmstrip projector, desktop computer, and other related items, education technology is nothing new. Second, technology's most significant contribution to schooling is likely to be the fact that it provides promising new ways to systematically deliver great learning solutions that tackle stubborn

problems and practices. Put simply, technology can make learning solutions more affordable, reliable, available, customizable, and data-rich.

**Affordability.** Technology can make the delivery of learning more affordable, just as it has changed cost structures in the music industry with cheap music via iTunes and MP3 downloads. Bits are much cheaper to deliver than people.

**Reliability.** Technology makes delivery more reliable. The best music, dance, and sports are now readily available via technology. With recorded performances, there are no schedule hassles, travel problems, or performer illness issues. A digitally mastered version of a concerto or popular song is now available with a mouse click. As Khan Academy shows, the same holds when it comes to providing instruction using technology: the learning environment always delivers as designed and never varies because of the instructor's mood or students being antsy before spring break.

**Availability.** Technology makes more things more available. Without technology, few of us would see the live World Series final or the parachuting Queen of England at the Olympics. A student in Brooklyn can now get one-on-one tutoring via an iPad, 24 hours a day, from a Mandarin speaker in Beijing or from someone with a doctorate in mathematics in Boston.

**Customizability.** Technology makes possible a more customizable experience. Sure, back in the day, your local butcher would set aside just the right pork chop for you. This kind of human-customized touch is now rare for most of us—it is too expensive and we are too mobile. However, as with Amazon or TripAdvisor, technology can offer a pretty decent substitute based on prior behaviors and an individual's choices. Technology can offer the same for learning (we will discuss computer-assisted tutoring soon).

**Making Experiences More Data-Rich.** Finally, technology can make experiences more data-rich. Developers accelerate their knowledge of how we use technology by looking at streams of information that our actions generate. This allows them to learn about what works, what is not used, and what individuals are actually doing with their expensive gadgets. "Watching" (with data) how learners interact with their learning environment reveals valuable information that can be used to help those learners—just observe any tutor watching closely as a student works on a problem.

**Putting the Capabilities to Work.** But it is important to remember that technology will offer these capabilities to poor as well as good solutions, hence the importance of determining why automating a given activity is at least as good or better for learning than its unautomated original.

A powerful example of how this all works together is tutoring. One-on-one tutoring is about the best way we know to provide intense instruction, real-time customized assessment, and intensive, personalized practice. But it is typically far too expensive to provide at scale.

Technology can help. Kurt VanLehn, professor of computer science and engineering at Arizona State University, has reviewed more than 80 studies of “intelligent” (in other words, computer-based) tutoring systems.<sup>6</sup> His analysis shows that the best of these systems can nearly match the performance of human tutors when it comes to helping students with the kinds of skills they need.

This is not magic. These systems reflect the tenets of good “learning engineering”—the application of learning science at scale to practically help students. They provide targeted feedback and repeated practice, adjust the pace to the individual student, use a variety of illustrations and explanations, and employ both audio and visual information. They are most likely not going to be as good as the very best human tutors—but they can approximate what typical human tutors do.

If these tutoring systems are not any better than human tutors, why bother with them? Because these tutoring systems are always available, do not get tired or sick, never have a bad day, and accurately tell you how things are going. Technology can deliver scalable, cheap-to-deliver, *good* solutions that do some things nearly as well as the average human tutor (if not as well as the very best ones). And these systems have the potential to generate large amounts of performance data that can be used to systematically improve them. In short, they can make quality tutoring more affordable, reliable, available, customizable, and data-rich—providing real benefits and learning solutions at scale.

Think about the practical challenges of tutoring. Houston Independent School District (HISD), for instance, uses hundreds of tutors for its Apollo 20 program. The district pays tutors \$20,000 a year, plus benefits.<sup>7</sup> Each tutor assists about 15 to 20 students a day, working with two students at a time. This means the cost of providing two-on-one tutoring for each participating student is more than \$1,000 per year, making it impractical to provide that kind of support to more than a small portion of HISD students. And the problem is not just the cost. Even with

tutors serving only 20 of Houston’s 200-plus schools, it is a challenge to recruit and retain enough talented tutors.<sup>8</sup>

Adaptive, intelligent tutoring systems are expensive to build—but they look pretty reasonable alongside the labor costs and practical challenges of two-to-one tutoring. The Open Learning Initiative at Carnegie Mellon University estimates that there will be a one-time cost of hundreds of thousands of dollars to build one of its adaptive tutoring systems to provide customized help to students for one course. Once it is up and running, though, recurring costs are minimal. Contrast that with the annual cost of recruiting and retaining enough good tutors to meet a district’s needs.

Tutoring systems show that when a good solution is combined with the advantages of technology, great things are possible. Mind you, such solutions can sometimes be pretty simple: when the movie camera was first developed, it was stuck on a stage recording an entire play from a fixed position. This was useful enough, but it took years before anyone realized the new technology made it possible to tell stories in much richer, more dynamic ways. We are still at the “camera on the stage” phase of technology for learning, but there are glimmers of what is possible in the future.

## **Mooresville Graded School District: It’s Not about the Technology**

Obama’s speech in Mooresville, with which we started, might give the impression that the district’s success was the result of fast Internet connections and lots of technology spending. That is not the whole story, and will not help us learn how to use technology to improve learning elsewhere. When one talks to Mooresville Superintendent Mark Edwards, it is striking how little he discusses the district’s technology. What really matters, says Edwards, is what schools and systems do with technology. He explains, “This is not about the technology. It’s not about the box. It’s about changing the culture of instruction.”<sup>9</sup>

A look at Mooresville’s digital conversion illustrates this emphasis on redesigning the learning experience. Starting in 2007, Mooresville began issuing laptops to all students in grades 4 through 12 and to licensed staff, providing 24-hour Internet access and adopting smart boards in all kindergarten through third-grade classrooms. As Edwards tells it, the district took pains to put learning solutions first, and then used technology to implement them in an affordable way. He says, “We melted the walls.

We redesigned the classrooms. We don't have straight rows. We don't buy desks anymore. We only buy tables, and we aligned them so that the teacher is really moving."<sup>10</sup> Classrooms do not have a traditional "front" and "back" because teachers are circulating or teaching from the middle of the classroom.

Edwards has said he expects teachers to "deftly move among tables of students, listening and observing intently, then engaging as needed with groups or individual students. It's a physical approach to teaching, but the benefits of proximity are truly significant."<sup>11</sup> This sounds a lot like what dynamic instructors have been doing and recommending for decades, with technology helping make such instruction more feasible in more classrooms.

---

Technology does not change the cognitive rules for learning, but offers ways to better deliver the learning experience.

---

Technology does not change the cognitive rules for learning, but offers ways to better deliver the learning experience. Edwards stresses that the technology is complementary to the district's focus on instruction and pedagogy:

We focused on achievement from day one, so we've had formative data meetings throughout the year and we look at classes, schools, individual students. On a regular basis our teachers are talking about their work. They've had a 1% raise in four years, and yet morale is real high because they were successful.

This has all paid off big time. In 2013, *Scholastic Administrator* named Mooresville the best school system in the country and the American Association of School Administrators named Edwards the nation's superintendent of the year. Between 2007—when the district began its digital conversion—and 2012, proficiency on core subject state exams in reading, math, and science rose from 68 to 89 percent, the graduation rate increased by 14 points to 91 percent, and the share of students attending a two- or four-year college rose from 75 to 88 percent.<sup>12</sup> Meanwhile, in 2011–12, Mooresville ranked third in the state for graduation rates and second in student test scores, while ranking only 100 out of 115 in per pupil spending, with annual outlays of \$7,400 per student.<sup>13</sup>

In his popular book *Every Child, Every Day*, Edwards sums up Mooresville's goal for its digital conversion:

"We are not trying to add on to old ways of teaching and learning. Rather we are trying to 'rethink school' from the ground up, enabled by today's technologies and guided by the demands of the 21st-century workplace."<sup>14</sup>

## Fixing E-Rate Is Just a Start

It is terrific that policymakers are finally rethinking E-Rate. Updating and broadening the list of permitted outlays and streamlining the application process makes good sense. But E-Rate, even if successfully overhauled, will not be enough to make a big difference in the quality of schooling. That requires school and system leaders taking advantage of new capabilities to rethink teaching and schooling to improve learning, using technology to get there more efficiently.

On that score, there is much more that policymakers can and should do to allow and encourage such efforts. As John Bailey, executive director of Digital Learning Now!, has written, "Education is on the verge of a renaissance, as the digital revolution and technological advances offer the promise of providing each child with the high-quality, personalized education they deserve. While the transformation will continue, old policy models can slow down and hinder the progress being made across the country."<sup>15</sup> There are five good places for policymakers to start.

**Seat-Time Requirements.** State legislatures should dramatically loosen seat-time requirements in favor of academic measures. Ten US states and the District of Columbia require districts to use a specified length of in-class seat-time.<sup>16</sup> But as schooling becomes more dynamic, it only makes sense for policymakers to revisit rules that measure learning in terms of time spent sitting in a classroom in favor of rules that measure whether students have mastered content and skills. The National Governors Association has reported that while 36 states grant districts and schools some ability to award credits based on mastery rather than seat time, several states only permit mastery-based credits in physical education, art, and health—and not in core courses like English, math, history, and science.<sup>17</sup> This is a huge obstacle to allowing students to use online learning to take extra remedial courses in core subjects, or to use online learning to take advanced core courses on topics not locally available.

**Online-Learning Restrictions.** State legislatures should remove geographic restrictions or enrollment caps on virtual schools and online learning. State laws dictating

geographic restrictions or enrollment caps for schools are a peculiar byproduct of efforts to police quality in brick-and-mortar schools half a century ago. Such rules have hampered online learning in important ways. For example, California stipulates that students can only enroll in a virtual charter school if they live in a county contiguous to where the virtual school is chartered. According to Digital Learning Now!'s *2012 Digital Learning Report Card*, only 22 states allow students to enroll in online courses without enrollment caps or not restricted by geographic boundaries.<sup>18</sup> Others should follow suit.

---

E-Rate, even if successfully overhauled,  
will not be enough to make a big difference  
in the quality of schooling.

---

**Procurement and Funding Rules.** State and federal officials should revisit procurement rules and make it easier for schools and districts to spend funds sensibly. Twentieth-century funding rules and procurement regulations can trip up school and system leaders trying to invest in new technologies. But state and federal policymakers can alter rules and definitions to account for evolving technology. For instance, in 2009, Indiana's state board broadened the definition of a textbook to include digital content, allowing textbook funds to be used to purchase technology.<sup>19</sup> Superintendent Edwards recalls having difficulties during his tenure in Henrico, Virginia, when the district adopted one-to-one laptops.<sup>20</sup> The state board of education had to change its operational definition of textbook to "curriculum materials" and allow Henrico more maneuvering room with state funds. School districts encounter similar challenges with federal funding, through programs such as Title I and II of the Elementary and Secondary Education Act. Making sure that now aged rules do not deter district leaders from making the best strategic choices should be an imperative for state and federal officials.

**Teacher Evaluation Policies.** State legislatures should consider more flexible teacher evaluation policies or grant waivers to schools in which typical value-added or observation models are not appropriate. Most of today's teacher evaluation systems rely on value-added calculations and observational protocols that are designed for school environments where a classroom teacher "owns" 30 or so students for 180 days. If these conditions do

not hold, value-added metrics can get messy. It can be similarly complicated to translate today's popular observational models to online environments, where many of the models' assumptions do not apply. State and local officials quietly note that teacher evaluation systems are going to be an uncomfortable fit for hybrid or virtual school models, and may deter school or system leaders when they consider introducing school models that may run afoul of state law. Policymakers would do well to ensure that teacher evaluation systems do not assume that most teachers will teach in schools that abide by the rhythms of the 19th-century Horace Mann schoolhouse.

**Innovative Models.** FCC commissioners and federal officials should ensure that E-Rate funding rules do not close the door to innovative models. After a two-month period, the FCC received more than 800 comments on E-Rate's notice of proposed rulemaking. Among them were wise recommendations from a coalition of eight reform-minded groups that the FCC would do well to heed.<sup>21</sup> Especially noteworthy was the caution that the current program structure, designed for brick-and-mortar schools, may continue to unintentionally exclude nontraditional school models that feature online learning or rely on mobile devices. The coalition encouraged the FCC to keep such schools and their progeny in mind, writing, "The Commission's reforms . . . should not foreclose exciting new digital learning developments. The Commission should exercise caution to avoid overprescribing a process that would lead to the unintended consequence of denying entry to education entrepreneurs that may provide effective tools for teaching and learning."<sup>22</sup>

These wise words serve as a reminder that the power of technology lies in dynamic reinvention consistent with how learning works, and not in the hollow hope that a new device or application will by itself miraculously address America's educational challenges. Policymakers may be tempted to congratulate themselves for taking steps to reform E-Rate, leaving the rest for schools and systems to figure out. But if we are going to truly allow technology to fulfill its promise as an agent of educational transformation, there is still much work to do.

## Notes

1. White House, Office of the Press Secretary, "Remarks by the President at Mooresville Middle School — Mooresville, NC," June 6, 2013, [www.whitehouse.gov/the-press-office/2013/06/06/remarks-president-mooresville-middle-school-mooresville-nc](http://www.whitehouse.gov/the-press-office/2013/06/06/remarks-president-mooresville-middle-school-mooresville-nc).

2. White House, *ConnectED: President Obama's Plan for Connecting All Schools to the Digital Age* (Washington, DC, 2013), [www.whitehouse.gov/sites/default/files/docs/connected\\_fact\\_sheet.pdf](http://www.whitehouse.gov/sites/default/files/docs/connected_fact_sheet.pdf).
3. See Frederick M. Hess and Bror Saxberg, *Breakthrough Leadership in the Digital Age: Using Learning Science to Reboot Schooling* (Corwin, October 2013), [www.amazon.com/gp/product/1452255490/ref=as\\_li\\_qf\\_sp\\_asin\\_il\\_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=1452255490&linkCode=as2&tag=aeor-20](http://www.amazon.com/gp/product/1452255490/ref=as_li_qf_sp_asin_il_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=1452255490&linkCode=as2&tag=aeor-20).
4. Steven Roger Fischer, *A History of Writing* (Suffolk: St. Edmundsbury Press, 2001), 285.
5. Ajit Pai, "Connecting the American Classroom: A Student-Centered E-Rate Program" (event, AEI, Washington, DC, July 16, 2013), [www.aei.org/files/2013/07/22/-connecting-the-american-classroom-transcript\\_092647280283.pdf](http://www.aei.org/files/2013/07/22/-connecting-the-american-classroom-transcript_092647280283.pdf).
6. Kurt VanLehn, "The Relative Effectiveness of Human Tutoring, Intelligent Tutoring Systems, and Other Tutoring Systems," *Educational Psychologist* 46 (2011): 197–221.
7. Blueprint Schools Network, "Blueprint Fellows Program: FAQs," 2012, <http://blueprintschools.org/FAQs.php>.
8. Houston Independent School District, "Demographics, Facts and Figures," [www.houstonisd.org/domain/7908](http://www.houstonisd.org/domain/7908).
9. Alan Schwarz, "Mooresville's Shining Example (It's Not Just about the Laptops)," *New York Times*, February 12, 2012.
10. Unless otherwise cited, quotes throughout the *Outlook* derive from interviews with the author in 2012 and 2013.
11. Mark Edwards, "Our Digital Conversion," *School Administrator* 69 (2012): 20–24, [www.aasa.org/content.aspx?id=21680](http://www.aasa.org/content.aspx?id=21680).
12. Mark Edwards, *Mooresville Graded School District's Digital Conversion* (Mooresville, NC: Mooresville Graded School District, 2012), [www.mgsd.k12.nc.us/MGSD/Our\\_District\\_files/Presentation%20%28August%29.pdf](http://www.mgsd.k12.nc.us/MGSD/Our_District_files/Presentation%20%28August%29.pdf).
13. Ian Quillen, "Building the Digital District," *Education Week*, October 17, 2011, [www.edweek.org/dd/articles/2011/10/19/01conversion.h05.html](http://www.edweek.org/dd/articles/2011/10/19/01conversion.h05.html).
14. Mark Edwards, *Every Child, Every Day: A Digital Conversion Model for Student Achievement* (New York: Pearson, 2013), 3.
15. John Bailey, "New Education Models Need a New E-Rate," August 16, 2013, *The Hill*, <http://thehill.com/blogs/congress-blog/education/317329-new-education-models-need-a-new-e-rate>.
16. Carnegie Foundation for the Advancement of Teaching, *50-State Scan of Course Credit Policies* (July 2013), [http://commons.carnegiefoundation.org/wp-content/uploads/2013/08/CUP\\_Policy\\_PDF1.pdf](http://commons.carnegiefoundation.org/wp-content/uploads/2013/08/CUP_Policy_PDF1.pdf).
17. National Governors Association, *State Strategies for Awarding Credit to Support Student Learning* (Washington, DC, February 1, 2012), [www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-edu-publications/col2-content/main-content-list/state-strategies-for-awarding-cr.html](http://www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-edu-publications/col2-content/main-content-list/state-strategies-for-awarding-cr.html).
18. Digital Learning Now!, *2012 Digital Learning Report Card*, [www.digitallearningnow.com/wp-content/uploads/reportcard/2012/2012ReportCard.pdf](http://www.digitallearningnow.com/wp-content/uploads/reportcard/2012/2012ReportCard.pdf).
19. Maureen Mespell, "An iPad for Every Student; Bluffton High School Incorporating Technology in the Classroom," Indiana News Center, August 16, 2012, [www.indianasnewscenter.com/news/local/An-iPad-For-Every-Student-Bluffton-High-School-Incorporating-Technology-In-The-Classroom-166477756.html?m=y&smobile=y](http://www.indianasnewscenter.com/news/local/An-iPad-For-Every-Student-Bluffton-High-School-Incorporating-Technology-In-The-Classroom-166477756.html?m=y&smobile=y); and Geoffrey Fletcher, Dian Schaffhauser, and Douglas Levin, *Out of Print: Reimagining the K–12 Textbook in a Digital Age* (Washington, DC: State Educational Technology Directors Association, 2012), [www.setda.org/c/document\\_library/get\\_file?folderId=321&name=DLFE-1598.pdf](http://www.setda.org/c/document_library/get_file?folderId=321&name=DLFE-1598.pdf).
20. For more information on the Henrico initiative, see Mark A. Edwards and Vicki B. Wilson, "One Size Doesn't Fit All: Henrico County's Alternative Programs Pave New Paths for Even Its Youngest Lost Souls," *School Administrator*, May 2001, [www.aasa.org/SchoolAdministratorArticle.aspx?id=10852](http://www.aasa.org/SchoolAdministratorArticle.aspx?id=10852).
21. The eight were the Council of Chief State School Officers, Foundation for Excellence in Education, Alliance for Excellent Education, Chiefs for Change, International Association for K–12 Online Learning, Knowledge Alliance, National Alliance for Public Charter Schools, and the Clayton Christensen Institute for Disruptive Innovation.
22. Council of Chief State School Officers et al., *Education Coalition Comments* (September 16, 2013), [www.digitallearningnow.com/wp-content/uploads/2013/09/EducationCoalition-Comments-as-filed-9.16.131.pdf](http://www.digitallearningnow.com/wp-content/uploads/2013/09/EducationCoalition-Comments-as-filed-9.16.131.pdf).