DIGITAL LEARNING NOW!

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Funding the Shift to Digital Learning: Three Strategies for Funding Sustainable High-Access Environments

Implementation Strategies at the Intersection of Digital Learning and the Common Core State Standards

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This is the first in a series of interactive papers that provide specific guidance regarding adoption of Common Core State Standards and the shift to personal digital learning.

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Introduction

The question of equitable student access is one of the most important for leadership at all levels to consider; therefore, it forms the basis of efforts underway nationwide to advance high-quality learning options for all students.[1]

Expanded access yields expanded digital options. Full digital access for every student provides the platform for improved access to effective materials, online courses, and great teachers.

Digital Learning Now! is a state policy framework for the future of education based on the premise that all students have a right to a high-quality education, and in the 21st century, a high-quality education must include digital learning.[2] The framework stems from the belief that all students are digital learners and should have access to quality learning experiences unbounded by geography or artificial policy constraints.

> **All students are digital learners and should have access to quality learning experiences.**

Developed in 2010 with input from more than 100 experts, the framework was extended in 2011 to include a Roadmap for Reform that provides tangible steps toward systemic change.[3] Specific recommendations for state policymakers include:

- Ensuring access to high-quality digital content and online courses for all students;
- Replacing textbooks with digital content, including interactive and adaptive multimedia;
- Ensuring high-speed broadband Internet access for public school teachers and students;
- Ensuring all public school students and teachers have Internet access devices; and
- Using purchasing power to negotiate lower-cost licenses and contracts for digital content and online courses.

1 See Appendix A for a list of resources on high-quality digital learning from leaders in the movement.

2 Digital Learning Now! website. http://digitallearningnow.com

3 Digital Learning Now! Roadmap to Reform. http://digitallearningnow.com/roadmap-to-reform

Background

Education leaders and state policymakers face challenging decisions with selecting and deploying devices that provide access to high quality digital learning resources and services. Desktops, laptops, web appliances, and tablets are the vehicle through which students can access high quality instructional content, college and career ready assessments, and next generation learning platforms. The generation of students growing up online is increasingly demanding engaging, high quality curricula and content that offer interactive elements not possible with text-based resources. Students will produce content as much as they consume it while also collaborating with their peers. The shift to online assessment, likely for most state tests by the 2014–2015 school year, will also accelerate the need for high-access environments in order for to take advantage of enhanced assessment items. Devices by themselves will not transform education but they are a necessary and vital component of a strategy to deliver the opportunities afforded by digital learning.

Personal computer ownership has increased dramatically over the past decade. According to 2000 U.S. Census data, only 51 percent of U.S. households owned a computer and only 42 percent had home Internet access at the beginning of the millennium.[4] Recent surveys indicate an increase to 77 percent for home computer ownership and 71 percent for home Internet access.[5] Approximately 68 percent of American households now have a high-speed broadband connection.[6]

The nature of access has also changed. April 2012 Pew Internet research found that 88 percent of American adults have a cell phone, 57 percent have a laptop, 19 percent own an e-book reader, and 19 percent have a tablet computer. Of these, about 6 in 10 adults go online wirelessly with one of these devices.[7] Results from the 2011 Project Tomorrow Speak Up Survey of more than 5,000 schools indicate that more than 70 percent of school principals and administrators are using smartphones and well over half of the educational leaders surveyed are using tablets.[8]

Americans are increasingly embracing mobile technology. It has been ten years since mobile phone subscriptions surpassed fixed telephone lines.[9] Today, the adoption rate of tablets and e-readers has far surpassed the rates of adoption for other technological innovations such as DVDs, personal computers, and smartphones. In less than three years, the percentage of American adults with a tablet or e-reader grew from 2 percent (in 2009) to 29 percent (in 2012). A February 2012 report found that 40 million tablets were purchased in the United States in less than two years—a level of penetration that smartphones took seven years to reach.[10]

The increase in the availability and diversity of Internet-ready devices continues to expand learning opportunities outside of the traditional school day, requiring that policymakers explore mechanisms for improving connectivity at home and at school. Partnerships with municipalities and broadband providers can increase the number of community access points and make broadband more affordable for economically disadvantaged families.

4 U.S. Census, "Home and Internet Use of Computers in the United States," Issued September 2001, Based on 2000 U.S. Census Data. http://www.census.gov/prod/2001pubs/p23-207.pdf

5 U.S. Department of Commerce, "Exploring the Digital Nation: Home Broadband Internet Adoption in the United States," November 2011. http://www.esa.doc.gov/sites/default/files/reports/documents/exploringthedigitalnation-computerandinternetuseathome.pdf

6 Pew Research Center's Internet & American Life Project, "Home Broadband Report," August 2010. http://pewinternet.org/~/media//Files/Reports/2010/Home%20broadband%202010.pdf

7 Pew Research Center's Internet & American Life Project, "Digital Differences," April 2012. http://www.pewinternet.org/~/media//Files/Reports/2012/PIP_Digital_differences_041312.pdf

8 Speak Up 2011 National Findings, K12. http://www.tomorrow.org/speakup/SU11_PersonalizedClassroom_EducatorsReport.html

9 Mary Meeker, "Internet Trends" Presentation, May 30, 2012, http://littlelionco.blogspot.com/2012/06/internet-trends-2012-8-point-summary-co.html

10 "Levels of tablet adoption outpace smartphones says study," *Yahoo News*, February 25, 2012. http://my.news.yahoo.com/levels-tablet-adoption-outpace-smartphones-says-study-170227932.html

Data from the National Center for Education Statistics (NCES) reveals that an estimated 100 percent of public schools have one or more computers with Internet access and an approximate 3:1 ratio of students to computers with Internet access.[11] U.S. school districts own millions of computers, purchased with a variety of funding mechanisms, including technology and construction levies, year-end surpluses, grants, and occasional dedicated operating funds.

While the average ratio of students per Internet-ready computer may be close to 3:1, most schools struggle to keep computers up to date, operational, and connected to adequate bandwidth that can support the demands of next-generation digital learning tools and assessment systems. A new report from the State Educational Technology Directors Association (SETDA) highlights the need for investments in school broadband infrastructure and expanded student access to high-quality learning resources at home and at school.[12] A 2010 survey of E-rate funded schools found that nearly 80 percent of respondents described their school's connection as inadequate.[13]

In many cases, the quantity of computers is not as important as their quality. Tech support staffs are notoriously understaffed and stretched thin.[14] These issues further complicate the pervasive problem of educational technology being viewed as an unreliable add-on to the instructional program rather than as an integral and integrated support that improves outcomes. While the amount and nature of access is improving, the current state of universal student access to reliable, high-quality devices is unevenly distributed.

For state and district leaders, it comes down to two decisions: what device and who pays.

With thoughtful and well-developed models, educational leaders can determine a plan for investing in devices and meet multiple goals simultaneously—expanding student access to devices, enriching curriculum with new content and delivery methods, preparing for the shift to online assessments, and making sound financial investments in the future of education.

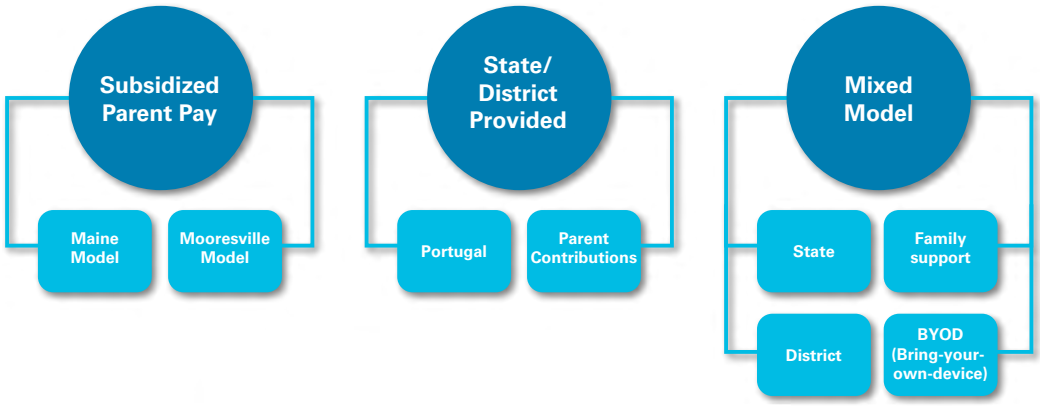
11 L. Gray, N. Thomas, and L. Lewis, L., *Educational Technology in U.S. Public Schools: Fall 2008* (NCES 2010– 034), U.S. Department of Education, National Center for Education Statistics (Washington, DC: U.S. Government Printing Office, 2010). http://nces.ed.gov/pubs2010/2010034.pdf

12 C. Fox, J. Waters, G. Fletcher, G., and D. Levin, *The Broadband Imperative: Recommendations to Address K-12 Education Infrastructure Needs* (Washington, DC: State Educational Technology Directors Association [SETDA], 2012). http://www.setda.org/web/guest/broadbandimperative

13 Federal Communications Commission, Measuring Broadband America (2011). http://www.fcc.gov/measuring-broadband-america#read

14 See for example "2010-2011 Survey Results: The Unique Challenges Facing the IT Professional in K–12 Education" from SchoolDude.com and CoSN. http://www.schooldude.com/assets/whitepapers/ITSurveyRpt-full_unq_face_it_k12-2011.pdf

Three Potential Strategies for Investing in Student Access



There are three historic technology buyers: parents/consumers, school districts, and states.

Beginning with these past practices, this paper describes three potential strategies for investment in student access devices—state and district provided, parent pay, and a mixed model.

Maine is currently the only state to make a line-item budget commitment to personal portable learning devices for students in grades 7 to 12. Other states and the federal government have used grant programs to encourage expanded access. Districts and communities have combined solutions to serve the needs of their own students—ranging from devices fully funded by the school to partially funded options that rely on some financial commitment from families. The growing BYOD trend provides a unique way to augment state and district investment by taking advantage of student-owned devices.

State- and District-Provided Devices: Maine and Mooresville

Maine

The Maine Learning Technology Initiative (MLTI) is designed to support teachers, help more students achieve state standards, and promote economic development. Maine was the first state with a plan to equip all students and teachers in grades 7 to 12 with a laptop computer.[15]

Former governor Angus King sparked the initiative in 2000 by proposing to use a budget surplus to equip each middle school student with a laptop.[16] In the fall of 2001, Maine selected the laptops and the Bill & Melinda Gates Foundation funded leadership training. Teachers received training through a combination of state efforts and contracted services with the provider. In 2009, MLTI expanded into Maine's high schools.[17] As of 2010, the program had served more than 53,000 students and 11,800 teachers.

15 Iowa is another state with a growing population of 1:1 schools. In Iowa, about one-third of school districts have deployed 1:1 laptop initiatives. Most schools in Iowa have gone 1:1 without any special funding or grants. Districts cover the costs of the laptops, and most make some use of equipment leasing and typically charge parents a fee that at least covers the cost of insurance for the device.

16 Maine Learning Technology Initiative website. http://maine.gov/mlti/about/index.shtml

17 D. Connerty-Marin, "Maine Expands Laptops to High School Students," March 11, 2009. http://www.maine.gov/tools/whatsnew/index.php?topic=MLTINews&id=69209&v=Details

Today, more than ten years after the implementation of the program, each seventh and eighth grader, approximately 60 percent of the high school students in Maine public schools, and each seventh- through twelfth-grade teacher has a state-funded laptop. Local schools cover the cost of devices for high school students. In total, the annual cost of the program is approximately $18 million, with approximately $11 million in state funds and $7 million from local school budgets. The cost per student is approximately $242, which includes professional development for teachers, technical support, and repairs.[18] Currently, laptops are leased by the Maine Department of Education and loaned to students who may take them home after parents sign a permission form. [19]

In coordination with the National Association of State Procurement Officers (NASPO), Maine is currently crafting a new request for proposal (RFP) for the next generation of digital learning in Maine that it hopes will yield innovative solutions for any state.[20] The RFP, which seeks solutions for equipment and services, will be issued in December of 2012. The process will end with a contract for the winning provider and will ultimately become available to all 50 NASPO member states.

Mooresville

Six years ago, the Mooresville Graded School District (MGSD) in North Carolina began the digital learning shift by placing laptop carts in high-school English classrooms and interactive whiteboards in primary-school classrooms. With the expansion of the program in 2009–2010, the district began phasing in laptops across grades 4 to 12.[21]

Dr. Mark Edwards, Mooresville Superintendent, believes all districts can make a digital conversion by establishing priorities, aligning resources, thoughtfully repurposing funds, and looking for cost efficiencies as well as productivity gains.[22] For Mooresville, the cost of hardware, software, digital content, professional development, and backpacks is $1,000 per student per year, based on 200 days a year and a four-year hardware lease. Put another way, the cost to provide every student with this digital learning experience was only $1.25 per student per day. (See special implementation section written by Dr. Mark Edwards on page 12.)

Mooresville demonstrates that the access challenge can be solved by thoughtfully reviewing and reallocating resources. As of 2012, the district ranked 100th out of 115 school districts in North Carolina in per-pupil expenditures, spending less than $7,420 per student—far less than the national average.

Edwards is confident that a similar approach to digital conversion is within reach for every school district. “I don’t know too many districts in the U.S. who could not copy our model and make it happen for kids,” he said. “Engage the community. Focus foundation requests on improving resources for your digital community.” The focus and alignment with instruction is delivering results. Mooresville has the second highest state graduation rate, at 91 percent, and the third highest set of assessment results in the state. Even more impressive is that 92 percent of their special education third graders scored “proficient” on the state math exam.

18 B. Washuk, “10 years after laptops come to Maine schools, educators say technology levels playing field for students,” *Sun Journal*, March 20, 2011. http://m.sunjournal.com/state/story/988012

19 Sample parent agreement form available at http://www.msad70.org/MLTILapt/Parent.pdf.

20 Maine Learning Technology Initiative Feedback website.. http://maine121.info

21 Mooresville Digital Conversion website: Academic Success. http://www5.mgsd.k12.nc.us/staffsites/digitalconversion/Digital_Conversion//Academic_Success.html

22 Mooresville Digital Conversion website: Technology Plan 2009–2013. http://www5.mgsd.k12.nc.us/staffsites/digitalconversion/Digital_Conversion//Technology_Plan.html

Subsidized Parent-Pay Model: Portugal and Various Parent Contributions

A second strategy is subsidized parent purchases of access devices based on a sliding scale for parent contributions. This would involve a state or district consortia using collective purchasing power to secure attractive pricing and subsidizing device sales to parents. This approach will be more prevalent in European and Asian countries, which have a history of parent-purchased textbooks. Turkey and India will subsidize the widespread adoption of low-cost, parent-purchased tablet computers. Like Portugal's 1:1 program, this could be done on a sliding scale with free devices for low-income students.[23]

Portugal

Mario Franco, President of Portugal's FCM-Foundation for Mobile Communications, leads one of the world's largest and most impressive education technology initiatives, the Magellan Initiative. In 2007, the sale of 3G licenses created a windfall for the government that Prime Minister Jose Socrates used to boost Portugal's lagging educational performance. He said he wanted Portuguese schools to be "at the front line of technological change."[24]

While Portugal funded the Magellan Initiative through spectrum sales, a revenue source not readily available to most states or districts, the example is worth highlighting to show the power of leveraging state purchasing to expand and improve access, especially for families with the greatest economic need.[25]

Writing in the Huffington Post in 2009, Don Tapscott recounted, "Portugal launched the biggest program in the world to equip every child in the country with a laptop and access to the web and the world of collaborative learning."[26] Tapscott explained how the Magellan Initiative works: "If you're a teacher or a student, you can buy a laptop for €150 (U.S. $184). You also get a discounted rate for broadband Internet access—wired or wireless. Low income students get an even bigger discount, and connected laptops are free or virtually free for the poorest kids. For the youngest students in grades one to four, the laptop/Internet access deal is even cheaper—50 Euros for those who can pay; free for those who can't."

The Magellan Initiative provides subsidized or free Intel-powered netbooks for elementary students. The computers are assembled in Portugal and feature an 8.9-inch screen, a webcam, and wi-fi in either a clamshell or touch slate version.[27] The Magellan Initiative complements Portugal's e-Escola project, which provides Windows notebooks and Internet access to secondary teachers and students. The UN reports an introductory price of €150 (U.S. $184) although "students from low-income households receive the laptop for free, but they have to pay for the broadband service subscription. The laptops are sold through telecommunication operators, which offer a €5 discount off the monthly broadband price, with reduced monthly fees for low-income students."[28]

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23 T. Vander Ark, "Portugal's 1:1 Initiative Propels PISA Improvement," *Getting Smart*, March 9, 2012. http://gettingsmart.com/blog/2012/03/portugals-11-initiative-propels-pisa-improvement

24 The Portugal News Online, "Gov't commits 400m Euros to equip schools with IT," April 10, 2008. http://www.theportugalnews.com/cgi-bin/article.pl?id=979-23

25 Initiatives in Argentina and Uruguay provide similar examples of a national commitment to expanding 1:1 access in order to address broader social issues such as poverty. http://www.cosn.org/Portals/7/docs/Community%20International/Opening_Doors_with_ICT-2011.pdf

26 D. Tapscott, "Note to President Obama: Want to Fix the Schools? Look to Portugal!" *Huffington Post*, June 24, 2009. http://www.huffingtonpost.com/don-tapscott/note-to-president-obama-w_b_220198.html

27 Additional specs available online at: http://www.mymagalhaes.com.

28 UN International Telecommunication Union, "Connect A School, Connect A Community Case Study: Portugal." http://connectaschool.org/en/schools/connectivity/devices/section_5.5/case_studies/Portugal

Parent Contributions

Schools that wish to expand access to devices through parent contributions have a number of options, such as adding a technology or device fee, leveraging bulk-purchasing power to develop lease or purchase programs for families, or encouraging students to bring their own devices. The contribution from parents can range from assuming the full cost of the device purchase, as is expected in many private school settings, to parents paying only a small user fee to cover school-owned devices.

Public schools and districts looking to go 1:1 with financial support from parents can look to the example of private schools, which have long histories of parent-purchase programs.[29] In private schools like Palmer Trinity School and Bishop O'Dowd High School, school leaders have found a way to offer the best in technology to students at a reasonable monthly rate because leasing spreads the total cost of the device over several years of student use. Schools or districts considering a parent-pay model can adjust the lease/purchase rate on a sliding scale according to income to accommodate the needs of individual families.

Beverly High School in Massachusetts provides an example of a public high school inspired by the parent-pay model found more often in the private school setting. Students at Beverly are required to use MacBooks each day. Laptops can be leased for $336 per year or $28 per month installments. At the end of the four-year lease, students can purchase their laptops for $1. Students who do not purchase or lease the MacBook from the school have access to school-owned computers during the day. Financial assistance for lease and purchase is available for families who qualify.[30]

While expecting families to cover the cost of student devices may not be a realistic expectation for all schools (e.g., those with high populations of students on free or reduced-price lunch or districts already challenged by contentious community relationships due to school levies and tax battles), the majority of 1:1 school districts programs that provide free devices to students supplement the state and district investment with parent technology fees or "user fees."

Sales-Tax Holidays

Holidays from state sales taxes are another way to encourage devices purchases and reduce cost for families. In 2011, 16 states offered sales-tax holidays for back-to-school purchases for between two and seven days. So far, six states (Alabama, Georgia, Missouri, New Mexico, South Carolina, Tennessee) have announced sales tax holidays specifically for the purchase of computers during periods throughout the month of August 2012.

Source: http://www.salestaxinstitute.com/resources/tax-holidays

29 Public schools considering a fully parent-pay model should consider the example of California's Fullerton School District, which reached an agreement with the American Civil Liberties Union in 2006 after parents filed complaints over mandatory purchase of devices. http://fsd.k12.ca.us/tms/1to1/legal/files/Press_Release_ACLU_042606.pdf

30 Beverly High School 1:1 Technology Initiative website. https://my.bhsonline.org/groups/bhstechnologyinitiative

This practice dates back to some of the digital pioneer school districts that went 1:1 in the mid-1990s through Microsoft's Anywhere Anytime Learning Initiative. Beginning in 1995, about a dozen districts launched parent-pay programs that charged monthly user fees for laptops with technology scholarships for economically disadvantaged students.

User fees are often part of the financing solution for state and district device programs as well. For example, as part of the family laptop agreement in Maine, districts require a small technology fee of $30 from each student. The technology fee covers theft, fire, power surge, natural disasters, and accidental (non-negligent) damage of the laptop both at home and at school.[31] Similarly, Mooresville Graded School District charges a $50 per year user fee that can be paid in installments by students who need payment assistance.[32]

As state and district leaders work to determine what access approach will best serve the needs of their students, user fees can be dialed up or down and combined with other strategies to create mixed models.

A Parent-Purchase Model: Palmer Trinity School

Since 1999, students at Palmer Trinity School in Florida have participated in a Wireless 1:1 Program that requires parents to lease or purchase a common device from the school.

Palmer Trinity leaders cite flexibility, customization, collaboration, personalization, performance, and efficiency among reasons for going 1:1 and believe high student access to devices will better prepare their graduates.

Beginning in 2006, Palmer Trinity students transitioned from laptops to tablets. Today, all students in grades 6 to 11 are required to either purchase or lease the Lenovo ThinkPad Tablet from the school. The tablet comes preloaded with software and is covered by a three-year warranty. Parents may pay in full ($1,000) or authorize their credit cards to be billed in scheduled monthly increments of $65 for 20 months (which includes an additional $275 for the Accidental Damage Plan). At the end of the two-year lease, families have the option to purchase the laptop for $200. Parents must attend a mandatory 90-minute laptop-training workshop with their students before the school year begins.

Information retrieved from Palmer Trinity School Laptop Initiative website http://www.palmertrinity.org/laptop

31 Maine School Administrative District 70 Laptop Take-Home Permission Form. http://www.msad70.org/MLTILapt/Parent.pdf

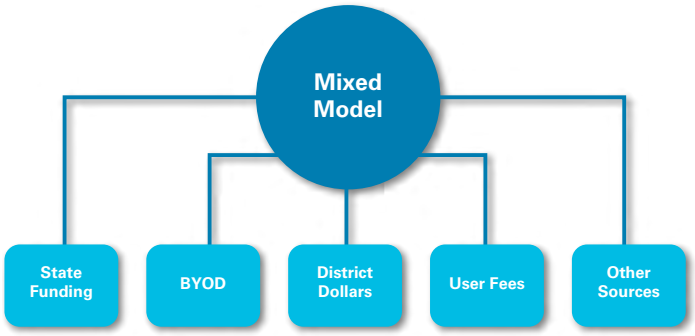
32 Mooresville Graded School District Parent/Guardian and Student Guide for Student Laptop Usage Fee. http://www5.mgsd.k12.nc.us/staffsites/digitalconversion/Digital_Conversion//Usage_Fee.html

Mixed Models

The diversity of characteristics among U.S. schools necessitates the formulation of student access strategies that can be tailored to the unique needs of individual districts.

Most states and districts will deploy mixed methods that blend elements of state, district, parent, and student contributions in combination with practices that leverage existing financial resources and reallocate dollars inside current budgets.

Mixed-model components may include different combinations of state funding, district dollars, parent user fees, reallocation of existing dollars, scholarship units, and existing student devices.



Charlottesville, Virginia, provides an example of a mixed model. Its recently launched 1:1 tablet initiative is called Blended Learning to Advance Student Thinking, or BLAST.[33] The $2.4 million project was funded by a combination of state technology funds, redeployed instructional materials funds, and a leasing plan.

There has also been a huge growth in low-cost and free digital learning resources and services for interacting, publishing, collaborating, editing, creating content, sharing lessons, and tutoring. Savings in these areas can free up resources for reinvestment in student devices and more value-added digital learning services.

33 T. Vander Ark, "Charlottesville chooses Windows tablets," *Getting Smart*, April 30, 2012. http://gettingsmart.com/blog/2012/04/charlottesville-chooses-windows-tablets

Building on existing assets with BYOD

Students come to school every day with smartphones, tablets, e-readers, iPods, laptops, and more, but they are often forced to keep these tools in their pockets, backpacks, and lockers—or risk disciplinary action. Forward-thinking teachers and school leaders are realizing that student tech tools should be seen as assets rather than liabilities, and they are leveraging these devices with bring-your-own-device (BYOD) and bring-your-own-technology (BYOT) policies that improve access by building on the existing resource of student-owned devices.

Jill Hobson is the Director of Instructional Technology of Forsyth County Schools in suburban Atlanta.[34] A few years ago, Hobson and a group of Forsyth teachers piloted BYOD and convinced the school board to update their Acceptable Use Policy to allow students to bring their own laptops, phones, and tablets to school—and put them to use.

Speaking to a group of superintendents in Atlanta, Hobson said, "You're already BYOT but you won't admit it." She was referring to the fact that, despite policies to the contrary, most students bring their own technology to school, but we ask them to power down and pretend they don't. Every school is a BYOT school, but only a few acknowledge and leverage the fact.

34 Forsyth County Schools website. http://www.forsyth.k12.ga.us

A BYOD Story: Forsyth County, Georgia

A group of six trailblazers at South Forsyth High School and 40 teachers across the county began implementing BYOT in 2009. By the start of the 2010–2011 school year, 44 percent of certified staff were participating as students used smartphones, iPads, laptops, and tablets for podcasts, apps, photo journals, surveys, calendars, notes, quick responses, and research. Forsyth has enough laptops on carts, with some available for checkout, to provide devices for students who don't have them.

School board policy allows students to connect to the district network via the secure wireless connection provided by the school system, but all access must be in accordance with their acceptable use policy (see Appendix B). Students are only permitted to access the Internet via the district's secure wireless connection access (but the policy acknowledges that some phones and tablets on data plans may circumvent that rule).

Director of Instructional Technology Jill Hobson describes the stages of implementation initiated by BYOT policy change: a philosophical change within the pilot classrooms during the first year spread to instructional adaptations in the second year and finally to widespread acceptance by year three.

Hobson advises school leaders considering BYOD to begin with a survey of existing student-owned devices and an information session for families.

Hobson said when you acknowledge BYOD, you can have a "screens up" portion of a class when students can use their devices and a "screens down" portion, which helps avoid texting under the desk when you'd rather have students focused on the topic at hand.[35] She notes that although there are many ways for students to integrate technology into their learning, there will also be times when you want students to power down and work without their devices.

BYOD will improve student access, but it won't necessarily close the digital divide without a good plan. To ensure that every student has a device, BYOD should be combined with school-provided devices available for checkout and take-home use (with a parent-signed acceptable use form). BYOD schools with wide income disparities should seek to reduce any stigma associated with a school-provided device and should promote periods of group work and peer-to-peer learning. Security and cyber-bullying policies should be clearly spelled out in acceptable use guidelines as well.[36]

School districts can also partner with parents and providers through services that provide devices for kids that come school-ready with parental controls, ability to block calls and texts during school hours, and customizable web filtering.[37] Since parents sign up as the customers, there is no cost to the school for services like these.

Implementation Questions

State Questions

Has a reliable access survey been completed for every school?

Is there a statewide purchasing program to secure bulk-purchase discounts for schools?

What is the feasibility of developing a matching program with a combination of state-appropriated and district funds?

Can the state provide flexibility in the use of textbook and instructional resource funds to support the purchase of digital devices and content?

District Questions

What are your digital-conversion planning objectives and how will they support implementing the Common Core and preparing for the new college- and career-ready assessments?

Have you developed a phased plan for improved access that incorporates textbook and open resources savings?

What resources can be reallocated to support deployment? What savings can be secured through adoption of digital resources?

Have you supported adoption of blended learning models that leverage teacher talent?

35 Forsyth County Schools BYOT website. http://www.forsyth.k12.ga.us/sfhs/byot

36 See Appendix B for resources related to BYOD policies and practices.

37 One example of this service is *Kajeet for Education*. http://www.kajeet.com/education

Implementing and Sustaining High-Access Environments

As states and districts plan to expand access, we expect to see approaches to implementation that combine mixed strategies—reallocation of existing funds, new policies that leverage student-owned devices, collaborative purchasing, state incentives, and more. Employing diverse funding strategies will help ensure long-term sustainability of initiatives, rather than relying too heavily on a one-time or unstable source that has the potential to disappear.

The Bottom Line

While fiscal considerations are certainly not the only reason for shifting to online and blended environments, research has indicated that the move from traditional to high-access environments can produce significant cost savings for states and districts.

In 2010, Project RED conducted the first large-scale national study to identify and prioritize the factors that make some U.S. K-12 technology implementations perform dramatically better than others. Researchers merged the findings from nearly 1,000 schools to identify a replicable design for technology integration and to create implementation tools based on this research.

Project RED, housed at the One-to-One Institute, offers tools to guide decision makers through everything from accessing readiness to measuring impact.[38] Among these, Project RED researchers designed tools for funding the move to high-access environments by identifying 14 specific areas where costs can be reduced in order to free up dollars for reinvesting in other areas, such as technology infrastructure and devices. While not all districts may be able to generate savings in all 14 areas, the 1:1 Cost Savings Calculator Tool can help districts to prioritize areas and determine a strategy accordingly.[39]

Project RED research shows an average cost of moving from a traditional 3:1 classroom to a 1:1 classroom of $298 per student per year, with potential savings of more than $400 per student per year.[40] Areas with the potential to generate direct savings include moving to digital materials and online assessments, reducing print and copying budgets, and moving professional development online. Additional savings are more indirect, such as reductions in the cost of post-secondary remediation.

While the cost for 1:1 implementation can vary widely based on purchasing decisions, research from Project RED formed the basis for the FCC report that determined that switching to devices from traditional tools like printed textbooks could save schools as much as $3 billion a year.[41] This figure was based upon an assumption of a $250 device estimate, amortized over four years. (See Appendix A for Project RED's Implementation Cost Comparison, which shows the nationally averaged technology implementation costs for a traditional school setting versus a high-access school setting.)

38 The Project RED Readiness Tool is available for download at http://projectred.org/resource-materials/red-tools/Implementation-Tools/Readiness-Tool.

39 The Project RED Cost Savings Calculator Tool is available for download at http://projectred.org/resource-materials/red-tools/Implementation-Tools/11-Cost-Savings-Calculator.

40 T. Vander Ark, "Project RED paves the digital learning path," *Education Week Vander Ark on Innovation*, August 4, 2012. http://blogs.edweek.org/edweek/on_innovation/2012/08/project_red_paves_the_digital_learning_path.html

41 FCC Commission, "FCC Chairman and Ed Sec Discuss Digital Textbooks With EdTech Leaders," March 29, 2012. http://www.fcc.gov/document/fcc-chairman-and-ed-sec-discuss-digital-textbooks-edtech-leaders

Financing a Successful 1:1 Digital Initiative

Dr. Mark Edwards, Superintendent, Mooresville Graded School District

1:1 digital initiatives have the ability to transform an educational system. Without a well-planned financial strategy, however, most 1:1 initiatives will fail. When planning to fund this type of major endeavor, decision makers must consider three integral parts: 1) infrastructure and network, 2) computer purchase or lease, and 3) software.

First, a strong infrastructure and network must be present to handle the computers and ultimately the software that will be utilized in the educational environment. Each district will have a certain amount of infrastructure already in place to provide the usual and customary services. Additional components consist of wired or wireless networking as well as the servers necessary to support the computers and software. Funds for this aspect of a 1:1 initiative can be provided from current expense accounts, capital outlay accounts, new construction accounts, or grants.

There are also a variety of options available for funding the computer purchase / lease program and needed software. These funds could also come from a current expense account, capital outlay account, new construction account, grants, or programmatic state and federal funds.

During the planning phase of a 1:1 initiative, the amount of capital needed may seem unfeasible. As you begin the process of implementing the initiative, however, you will find spending for items such as textbooks, workbooks, maps, globes, calculators, and reference books will decrease as these items will all be part of the digital world that all students will have access to. Also, do not forget to look at specific program resources such as for CTE or Exceptional Children when determining funds that may be available to support the program. Finally, there are many grants available that you may be eligible for; however, review grant applications carefully to ensure they don't fund a specific type or brand of equipment used that may be different from that being used by your system.

While it may be hard to wrap your mind around the cost of such an initiative, the cost can easily be reduced to a format that makes it more readily understood and accepted. Take the total cost for each computer and divide it by the useful life (four years). Divide this number by the 200 days the computer is available to the student for unlimited use. This figure—your daily cost—is much more manageable.

As you can see, for around $1.00 per day, you can provide your students with 21st-century tools that will produce improvements in attendance, test scores, and student engagement. That is PRICELESS!

Another aspect of a 1:1 initiative that will need to be addressed is staffing. With a 1:1 initiative, technology staffing will need to be increased; however, a much larger digital program can be managed with even a small increase in staffing. Each school will need a help desk with a person who can manage day-to-day issues with the laptops including minor repairs. The help desk position can be funded through the elimination of other positions that will no longer be needed once the laptops are distributed, such as a computer lab position.

With any technology, repairs will need to be made. Funding for needed repairs comes from the insurance fee charged to students. Mooresville Graded School District chose to be self-insured rather than purchase a policy for repairs. While the insurance fee is minimal, it is effective since the financial commitment puts some responsibility on the student to take care of the machine. While every student is charged the insurance fee to pick up his or her laptop, district understands that the insurance fee may place an undue burden on some families. Therefore, the Mooresville Graded School District Foundation for Excellence in Education has established an annual fundraiser to provide the funds needed to support those families.

Buying vs. Leasing

Districts are not well equipped to make productivity-enhancing capital expenditures. They can float a long-term bond to build or remodel a school, but there's often no facility for making short-lived asset purchases like technology. Some wealthier districts can add a technology levy, but most schools and districts make haphazard use of grants, programmatic funding, and end-of-year surpluses. Erratic purchasing patterns lead to different computer and software combinations with no plan for regular updating.

Leasing offers the opportunity to manage an asset category like instructional technology more rationally. The Consortium for School Networking (CoSN) suggests that leasing be considered as a means for sustaining refresh schedules—and shifting from every six or seven years to every three or four years.[42] Providers are also exploring new subscription-based models where a device, content, and even Internet access are bundled together in a per student monthly subscription plan.

Leasing levels out the annual expenditure of student and teacher laptops. It's usually easier for a district to include a regular lease payment in an annual budget than to plan for large expenditures every four years. Leasing adds a finance charge, which increases the total costs. Improving refresh schedules may also yield increases. However, the benefits of hardware/software standardization may offset the higher cost of leasing.

42 See for example CoSN's "Mastering the Moment" white paper, available for download to CoSN members.

Leveraging State Incentives in South Dakota

Spearfish Schools was one of 20 pilot districts that took advantage of South Dakota's Classroom Connections Project in 2006–2007. The program provided a one-time incentive for districts to go 1:1 with a $1 match from the state for every $2 that districts spent on devices and technology infrastructure. This one-time state match incentivized the initial participation of districts that now fund device purchases from district-operated budgets.

Today, every student and teacher at Spearfish High School is equipped with the same "fully loaded" device that is purchased for $1,100 with dollars from the district's capital outlay fund. Parents are not required to make a financial contribution, and about 75 percent of parents purchase the optional $25 device insurance.

Students and teachers get new devices every three years. Since 2007, Spearfish has purchased new devices twice, with a new set of touchscreen tablets on their way for 2012–2013.

Among the advantages to Spearfish's 1:1 environment, Principal Steve Morford cited both student and teacher satisfaction. He stated that everyone from student teachers to 35-year veterans appreciates the opportunities that the technogically rich learning environment provides. Mr. Morford believes the 1:1 program is one reason why the district continues to attract the best teacher talent year after year.

Spearfish South Dakota provides a good example of the way states can use incentive participation to set increased student access into motion.

Information based on June 2012 telephone interview with Dr. Steve Morford.

Overall, plummeting device prices and open software resources are making the shift to digital much more affordable. Today's devices are available for around $500 and utilize open resources. The combination is more powerful than loaded laptops costing $1,500 just three years ago—and they are available for lease for about $20 per month.

Schools considering the 1:1 use of $500 laptops can make the full shift using leasing or phase in a purchase plan over three years. A district that has the discipline to phase in a technology plan and manage an annual refresh program will save money by purchasing rather than leasing. On the other hand, leasing can facilitate whole-school or district-wide implementation and certainty on the refresh schedule.

With leasing, it is important to predict whether the equipment will be purchased or returned at the end of the lease. It will be cheaper to accept a '"fair market value" buyout at the end of the lease, but if parents are likely to buy laptops it is often better to have a defined purchase price to avoid confusion. If a district is considering leasing, it's always a good idea to compare rates, lease terms, fees, and options available from various banks, equipment vendors, and leasing companies.

Power of Partnerships

As districts develop their own plans, they might consider the creation of "access partnerships" for bulk purchasing and knowledge sharing. Access partnerships can also include a matching grant program.[43] For example, a state chief who wants to use a device with a total expenditure of $200 per student and teacher per year may propose a combined budget that includes a state contribution (for example, $75 per student); a matching district contribution from a reallocation of technology, instructional materials, assessment, professional development, and staffing budgets; and a parent contribution of $75 (with scholarships averaging about $50 per student).

While Portugal funded the Magellan Initiative with a one-time spectrum sale, the Portuguese example of providing subsidized devices to families is still available to U.S. states and districts, and a partnership could be coordinated by a nonprofit or foundation instead of a state. A nonprofit working with a state department of education could administer an inexpensive or free program that districts could join by making a small contribution and asking parents to pay an annual user fee.

Educational Goals

State and district leaders must carefully weigh educational goals as they make purchasing decisions. For example, if writing is a district priority, devices with full-sized keyboards or the additional purchase of tablet keyboards may be preferred. Technical support should be considered in district purchase decisions. Web appliances make it easy to continually and virtually update the computing environment.[44]

43 For more information on cooperative purchasing, see NASPO's "Strength in Numbers: An Introduction to Cooperative Procurements." http://www.naspo.org/documents/Cooperative_Purchasing0410update.pdf

44 T. Vander Ark, "Charlottesville chooses Windows tablets," *Getting Smart*, April 30, 2012. http://gettingsmart.com/blog/2012/04/charlottesville-chooses-windows-tablets

Because most states are in the process of planning for the shift to online testing, districts should consult with their state education agencies. Both state testing consortia (PARCC and Smarter Balanced) plan to use online assessments and have established device guidelines including size, speed, and resolution. Smarter Balanced and PARCC recommend that new device purchases meet minimum specifications:

- Device Types: Desktops, laptops, netbooks, thin clients, tablets
- Processor: 1 GHz or faster
- Minimum RAM: 1 GB
- Display: 9.5 inches or greater at a resolution of 1,024 x 768 or greater
- Operating System: Mac OS X 10.7, Windows 7, Linux (Ubuntu 11.10 or Fedora 16), Chrome (no version specified), iOS (no version specified), Android 4.0
- Connectivity: Wired or wireless, with Internet access

Conclusion

All students need access to a high-quality education. In 2012 and beyond, that means universal and equitable access to the best technologies to personalize and customize learning. As policymakers and educational stakeholders work toward achieving this goal, we expect to see an array of funding solutions—ranging from devices purchased on the state, district, or school level to those purchased through a combination of existing dollars, reallocated funds, student devices, and parent dollars.

Increases in the availability of affordable devices, quality digital content, and productive school models require that states and districts plan the shift to digital learning now. The introduction of online assessment over the next three years further necessitates generating a plan and taking action now.

The most important driver in devices should be high quality content. Most schools currently have a mix of print and technology-based learning resources, most of which is not aligned with each other much less the new demands created by the Common Core. Making a commitment to shift to high quality digital instructional materials can save money, extend access, improve engagement, and most importantly, improve student success.

Historically, the cost of devices and issues of connectivity have created a gap in the opportunity to learn. Today, for the cost of a few print textbooks, a student can have a devices that allows them to access thousands of books, new online content and multimedia resources, and cutting edge services that personalize their learning. Tapping the potential of open educational resources can produce additional savings for reinvestment into other instructional priorities, resources, and content.

State leadership is imperative right now, not in five or ten years. Governors, chiefs, legislators, and education technology directors in every state need to lead statewide conversations about access options. A combination of access strategies can and should be deployed over the next three years to ensure that every American student has full-time access to high-quality learning opportunities.

Policymakers and educational leaders have a number of funding options available when considering how to expand student access to high-quality devices. Beginning with an assessment of current access, leaders can begin to develop a strategy that is tailored to the needs of the learners in their care.[45] The Louisiana Department of Education's recent launch of the Technology Footprint provides an example of a state that is taking district evaluation of access seriously. By utilizing these tools, districts and schools get a report that provides a current view of capabilities to compare against technology requirements that will fully support online assessments, Common Core, and digital resources.[46]

Yet, simply funding the shift to high-access environments isn't enough. Policymakers must go the additional step to plan for sustainability of these environments to ensure devices are updated on an ongoing basis. Funds can be reallocated to help offset costs and savings from discount programs such as the E-rate can help with affordability. These strategies would be substantially aided by a weighted portable funding system that reflects student risk factors and follows the student to the best learning option, a recommendation included in Digital Learning Now! essential elements.

In addition to national and state leadership, local leaders must have a full-scale implementation strategy that begins and ends not with devices, but with student learning. Without a detailed plan for the utilization of technology to personalize and extend learning in new and meaningful ways, dollars spent putting these tools in the hands of students and teachers will be wasted.

Karen Cator, Director of the Office of Educational Technology at the U.S. Department of Education, agrees. When recently asked, "What device and who pays?" Cator said, "Don't get too hung up on devices; they come and go."[47] Cator's comment reminds us that the focus of the digital movement must remain squarely on the big picture of improved learning opportunities for students. While devices are important, we should not get too distracted by the devices and tools themselves. The value comes from the content and experiences that devices allow students to access.

> **Device acquisition must be part of a much broader conversation around personalizing educational opportunities that allow for deeper learning.**

Device acquisition must be part of a much broader conversation around personalizing educational opportunities that allow for deeper learning. Expanded access is just one component of what must be a larger movement to personal digital learning that considers instant feedback from online assessments, innovative digital tools to capture and share data, competency-based models of progression through content, and new student funding mechanisms that allow for dollars to follow the student to the course level.

45 Gregory & Denby Associates provides a useful self-assessment tool that measures readiness for personalized learning, available for free download at http://www.gregorydenby.com

46 http://www.louisianaschools.net/footprint

47 T, Vander Ark, "Conclusions from The Ohio Digital Learning Summit," *Getting Smart*, May 17, 2012. http://gettingsmart.com/blog/2012/05/conclusions-from-the-ohio-digital-learning-summit

Appendix A

Implementation Cost Comparison

What is the cost to move to a 1:1 environment?

Project RED
REVOLUTIONIZING EDUCATION

Traditional Classroom (3:1 Ratio)		1:1 Classroom (1:1 Ratio)	
HARDWARE			
$1,000	Cost of student computer with 4-year warranty	$900	Cost of student computer with 4-year warranty
$1,100	Cost of teacher computer with 4 -year warranty	$1,100	Cost of teacher computer with 4 -year warranty
$7,600	Total cost of 1 printer per classroom plus 2 for common areas (20 b/w lasers and 2 color lasers)	$9,200	Total cost of 1 printer per classroom plus 4 for common areas (20 b/w laser printers and 4 color laser printers)
$202,100	Total cost over 4 years	$509,200	Total cost over 4 years
$101	Cost per student per year	$255	Cost per student per year
SERVERS, ROUTER, FIREWALL, AND RELATED SOFTWARE			
$25,000	Cost of servers, router, firewall and software	$50,000	Cost of servers, router, firewall and software
$13	Cost per student per year	$25	Cost per student per year
ANNUALIZED SOFTWARE COSTS			
$50	Cost per student per year for instructional software	$50	Cost per student per year for instructional software
$13	Cost of productivity tools per student computer	$40	Cost of productivity tools per student computer
$25	Cost for LMS, assessment software, etc.	$25	Cost for LMS, assessment software, etc.
$8	Installation and customization costs per student	$13	Installation and customization costs per student
$96	Cost per student per year	$128	Cost per student per year
WIRELESS NETWORK			
$2,000	Cost per classroom/common area, includes POE	$3,000	Cost per classroom/common area, includes POE
$50,000	Total infrastructure	$75,000	Total infrastructure
$14	Cost per student per year	$22	Cost per student per year
TELECOM			
	10 Kilobits/sec/student average		*50 Kilobits/sec/student average*
$75	Cost per megabit at 5 megabit/second rate	$50	Cost per megabit at 25 megabit/second rate
$225	Cost per month	$1,250	Cost per month
$2,250	Cost per year (10 months)	$12,500	Cost per year (10 months)
$5	Cost per student per year	$25	Cost per student per year
TECH SUPPORT (0.25 dedicated tech support person, presumes 4-year hardware warranty)			
	0.25 dedicated tech support person		*0.5 dedicated tech support person*
$75,000	Cost of tech support person plus overhead	$75,000	Cost of tech support person plus overhead
$38	Cost per student per year	$75	Cost per student per year
PROFESSIONAL DEVELOPMENT			
	0.25 trainer year 1, 0.125 trainer years 2-4		*0.50 trainer year 1, 0.25 trainer years 2-4*
$100,000	Cost of PD person, fully burdened	$100,000	Cost of PD person, fully burdened
$62,500	Total cost	$125,000	Total cost
$31	Cost per student per year	$63	Cost per student per year
$298 Total cost per student per year		**$593**	**Total cost per student per year**

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N.B. Costs for most areas listed above have decreased approximately 15% since the time of publication. The only area of substantial increase is in Internet Access due to increased usage.

Appendix B: BYOD/BYOT Resources

Case Studies & Profiles

Consortium for School Networking (CoSN)
Student Mobile Learning Devices: A Summary of Two District Case Studies
http://access4ed.net/sites/default/files/tco-voicasestudysummary.pdf

Forsyth County Schools BYOT Video Tour
https://fcschoolsga.eduvision.tv/default.aspx?q=3SfVi13wT7SmZEIpTemLWg%3D%3D

Forsyth County Schools NBC News Video Profile
http://www.msnbc.msn.com/id/3032619/ns/NBCNightlyNews/#47315431

Acceptable Use Policy Resources

Consortium for School Networking (CoSN)
Acceptable Use Policies in a Web 2.0 and Mobile Era
http://www.cosn.org/Portals/7/docs/Web%202.0/Acceptable%20Use%20Policies%20Web%2020%20Mobile%20Era.pdf

Forsyth County Schools BYOT Acceptable Use Policy
http://www.forsyth.k12.ga.us/page/830

Forsyth County Schools BYOT Acceptable Use Policy Guidelines Video
http://www.forsyth.k12.ga.us/page/830

New Canaan Public Schools Acceptable Use Policy
http://www2.newcanaan.k12.ct.us/education/dept/dept.php?sectiondetailid=4632&

Oak Hills Acceptable Use Policy Development Framework
http://ohlsd.org/portfolio/byod-developing-an-acceptable-use-policy

St. Marys City Schools BYOT Manual
http://www.smriders.net/assets/pdf/BYOT-FAQ-Manualv2.pdf

Tips and Tools

Epic-Ed National Online Community of Practice Exploring Digital Conversion
https://www.epiced.org

Forsyth County Schools BYOT Resource Page
http://www.forsyth.k12.ga.us/page/824

Oak Hills School District Portfolio of BYOD Resources
http://ohlsd.org/portfolio/topics/byod

Project RED Resources and Implementation Tools
http://projectred.org/resource-materials.html

Shelly Sanchez Terrell's 50+ Tips and Resources for Getting Started with Mobile Learning
http://dl.dropbox.com/u/9520920/Effective%20Mobile%20Learning.pdf

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John Bailey serves as the Executive Director of Digital Learning Now, a national initiative of the Foundation for Excellence in Education that works with policymakers and innovators to accelerate the adoption of new models of education. John previously served at the White House as Special Assistant to the President for Domestic Policy during the Bush administration and was the Deputy Policy Director for the U.S. Secretary of Commerce here he worked on innovation policy. John's experience also includes working at the Bill and Melinda Gates Foundation where he built a portfolio of advocacy grants to advance college and career ready policies. He served as the nation's second Director of Educational Technology and has been a formal or informal advisor to three Presidential campaigns. He is on the Board of Directors for the Data Quality Campaign and serves on the regional board for the social innovation fund Indego Africa. He also serves a Sr. Advisor to Whiteboard Advisors which provides strategic consulting for investors, philanthropies, and entrepreneurs.

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Carri is the Director of Policy and Research at Getting Smart. With a background in both policy and practice, she has taught in classrooms from elementary schools to college campuses. Carri has served as an online educator since 2005 in a fully-online Master's program in Educational Leadership and has authored several pieces on the future of education. She co-edited the book *Building a 21st Century U.S. Education System* with Bob Wehling, published by NCTAF. Carri has been actively involved in supporting education policy efforts to advance digital and blended learning opportunities as a consultant to state and national organizations, including KnowledgeWorks. She holds a M.Ed. in Educational Administration and an Ed.D. in Urban Educational Leadership.

Tom Vander Ark

Author and Executive Editor, Getting Smart

Tom is author of *Getting Smart: How Digital Learning is Changing the World* and Executive Editor of GettingSmart.com. Tom is also a partner in Learn Capital, a venture capital firm investing in learning content, platforms, and services with the goal of transforming educational engagement, access, and effectiveness. Previously he served as President of the X PRIZE Foundation and was the Executive Director of Education for the Bill & Melinda Gates Foundation. Tom was the first business executive to serve as public school superintendent in Washington State. Tom is a director of the International Association for K-12 Online Learning (iNACOL) and several other nonprofits.