

Determine Your Position on the Scale of Digital Equity

Executive Summary

Providing digital equity to every student is much more important than just giving them the ability to complete homework at home. It's about how to deliver new learning opportunities. Educators have arrived at a crossroads where pedagogy meets network technology. As a district leader, initiatives that enable high-quality digital learning and provide services and support to your instructors for teaching anytime, anywhere on any device, are increasing in importance.

The Learning Counsel 2016 Digital Curriculum Strategy Survey¹ found that even though eighty to ninety percent of schools have network coverage, it's not enough to support the burgeoning use of digital curriculum. Most educators consider the network to still be "unreliable."

This brief examines how schools are facing the problem of digital equity and explores the main considerations for districts as they start their digital transformation.

When the bulk of curriculum budget is shifted from paper-based textbooks to digital resources, teachers and schools are running headlong into a new breed of confusion and barriers.

"Educate and inform the whole mass of the people... They are the only sure reliance for the preservation of our liberty."

— Thomas Jefferson

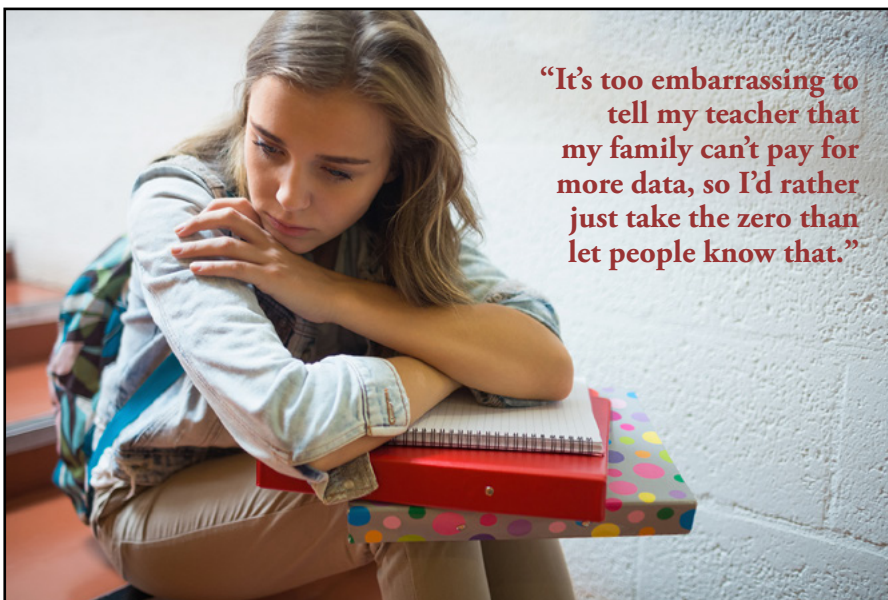
In this Brief

"Enough" used to be just making sure there was some sort of access for everyone, but enough is not enough anymore.

Now that digital content uses full-streaming video and more, a new scale of network infrastructure is emerging.

This brief contains a special Evolving Scale of Digital Equity for schools to evaluate themselves against current and future needs.

Also included are 11 Insider Tips to Achieving Digital Equity.



Per the Survey, top issues preventing a thorough transition to digital learning are *professional development* and *technology training*, such as building teachers' professional skills for folding technology into instructional practices.

One of the "fast moving" issues schools are experiencing as they start leaning heavily on digital content, is that most (eighty percent) have not reorganized their budget accordingly. To successfully transition to digital, schools and districts will need to migrate away from paper textbooks as a trade for their digital content and build-out of technology.

Providing Context to the Digital Equity Issue

The equity conversation has many facets, and every stakeholder plays a part in this digital shift, as demonstrated at Bartholomew Consolidated School Corp. in Columbus, IN. This school district placed 12,000 devices in student hands, from kindergarten to high school. Starting in seventh grade, students take their devices home with them.⁹ That doesn't mean, however, that they always have access to the Internet.

Director of Technology, Mike Jamerson, says "Consider the basic problem of geography." As this long-time technologist and CoSN board member explains, "In our district, seventy-five percent of our households [are located] in a glacial plain where Wi-Fi is possible." But the other twenty-five percent live in a mountain range "that can't be or won't be reached by most telecom carriers because it's not worth it to them to build into those areas."¹⁰

Most districts face comparable challenges, acknowledges Jamerson, noting that if they had all the money they wanted, they could immediately fix the issue. "We could build our own towers. But again, that's a big conversation for all stakeholders. Towers came up eight years ago, and at that time I think the price tag was \$10 million, and it wasn't going to be possible."

As an alternative, Bartholomew has followed the philosophy of "Universal Design for Learning," which guides decisions based on accommodating individual learning needs. "We serve students with their best options, tailored for their best learning style,"

(continued in sidebar, page 3)

Equity is Not Simple

When looking at how schools "go digital," one of the often-overlooked aspects is the actual digital content. On top of whether the student has a device at all, or whether the network is reliable, is this new equity issue – the richness of the content itself. This new dimension intensifies the most intractable barrier in going digital: disparities based on the class of the courseware or digital objects being offered by the school.

Merely having access (including wired or even dial-up), is no longer enough – the software programming and design of the content is of utmost importance. It must also be delivered seamlessly, without the dreaded buffering symbol forcing students to wait.

If students aren't able to become actively engaged in their education with tools that are truly digital, not just digitized, they won't be motivated to learn. Even the most dramatic administrative and operational changes will make little impact if students still perceive the curriculum to be irrelevant, "flat" content that is disconnected from real life. It's important to remember that the problem with student motivation has two faces: students who are underperforming due to problems posed by their economic situation or language hurdles, and students who aren't challenged enough or performing ahead of grade-level standards, causing them to suffer through lessons of content they already know.²

As software behind digital content becomes increasingly sophisticated, full of clickable links, short and long form video, animated gaming, encouraging screen casting or sharing, and student generated content uploads, with the use of embedded intelligent learning engines, it requires bandwidth that dwarfs simple browsing or PDF downloads. To progress to quality digital learning, next generation education networks must be "systematically implemented."

A giant step toward digital learning implementations is to put a solid plan in place for network, and especially wireless, infrastructure. For example, high-speed broadband, an essential element of achieving digital transformation, is not a part of many campuses. According to EducationSuperHighway, in 2015, seventy-seven percent of school districts were meeting the minimum goal of 100 kbps per student, adopted by the Federal Communications Commission (FCC).³ While that's an improvement from the thirty percent of schools that reached the goal in 2013, it still left 21 million students in schools not meeting the FCC minimum.⁴ Likewise, Internet connection affordability is

"We serve students with their best options. If a student needs Wi-Fi and technology, we make sure [he or she] gets it."

*—Mike Jamerson
CTO Bartholomew School Corp (IN)*

showing "significant improvement" according to the latest infrastructure survey from the Consortium for School Networking (CoSN). Almost half (forty-six percent) of respondents reported paying less than \$5 per megabit per second (Mbps) per 1,000 students compared to twenty-seven percent in 2014.⁵

Just a year later, the stakes are being raised. In late 2016, the State Educational Technology Directors Association (SETDA), the source of the original FCC network guidelines, increased its recommended broadband capacity. To support "student-centered learning," SETDA advised medium school districts (around 3,000 students) to have at least 1 gigabit per second (Gbps) per 1,000 users for the 2017-2018 school year, and to triple that by 2020-2021.⁶

To exploit high-speed data connectivity, the hardware and software running in the school district data center, onsite at school locations, and within individual classrooms needs to be brought up to par with an eye to future growth. Both the number of devices (2-7 per student) and the "heavy" bandwidth use of immersive digital courseware needs to be accounted for. That includes wireless access points, switches, firewalls, systems management/control components and related gear.

What Inequity Looks Like

The Learning Counsel survey sites that seventy-eight percent of students have access to a device for some significant portion of the school day, either with a full 1:1 (one device for one student), bring-your-own-device, laptop carts or a mix of these. Schools are now finding that "sharing" doesn't work as well when devices are used between multiple students, or randomly accessed. According to the Consortium for School Networking's (CoSN) report, fewer than a tenth of school systems reported that all students have access to "non-shared devices at home or in the community." The first inequity is on campus, and due to the adoption of better learning software, it is driving a new kind of inequity that reflects back on the need to ensure uniform device access and higher bandwidth.

Another type of inequity lies in student's inability to access the network outside of school. Just forty-two percent of district technology leaders ranked lack of broadband outside of school as a "very high priority." Two-thirds (sixty-three percent) of respondents have no strategy for providing off-campus connectivity to students. While that is an improvement over previous years, the Learning Counsel survey report noted, "The vast majority of school systems are not yet providing leadership on digital equity."

However, even where broadband exists, there is an issue of how education is delivered over the Internet, with homework and remedial learning turning entirely digital. A recent study by the FCC examined the state of Internet access nation-wide, and as reported by Ars Technica, "millions are still living life in the slow lane" of at-home Internet service.⁷ "While the FCC defines broadband as download speeds of 25Mbps, about 47.5 million home or business Internet connections provided speeds below that threshold," and many, the article noted, "aren't anywhere close to modern."⁸ ■

(continued from sidebar, page 2)

says Jamerson. "When it comes to off-campus Wi-Fi, we're still evaluating the best solution to support students and families who are underserved and lack resources."

The teachers also play their part, always pushing us "for more and better," says Jamerson. "They are incredibly creative and want great courseware and tools. We're always playing catch-up in that regard."

Students also help to come up with solutions themselves. "When you vest them with responsibility, they can surprise you," Jamerson notes. One high student, for example, undertook a project in which he identified free Wi-Fi hotspots across the city and district. "He documented this and then produced a map of every spot where students could get online." Now the map is publicly available on the district website.

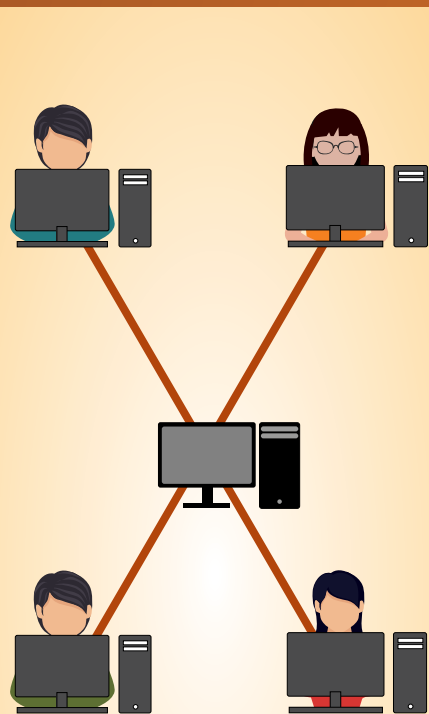
That kind of innovative approach gives students options for reaching the learning management system at all times. "It's especially important for a district like ours that has snow days," asserts Jamerson. "We need to make it possible to keep school delivery going. Now we no longer need to cancel school. It's held on our LMS online."

Said Jamerson, "While digital equity at its best might be full Wi-Fi coverage and what people call a smart city grid to efficiently manage all information and community systems,¹¹ [until we get there] we are working to solve it in many ways."

EVOLVING SCALE OF DIGITAL EQUITY

In many ways, the connectivity and access to the internet has transformed education at all levels. The ability for students to access learning materials online as well as for instructors to share lessons and collaborate has revolutionized teaching and learning. Where education used to be concentrated in school buildings, it can now be accessed by millions of people (almost) anywhere.

Stage 1: Wired Only



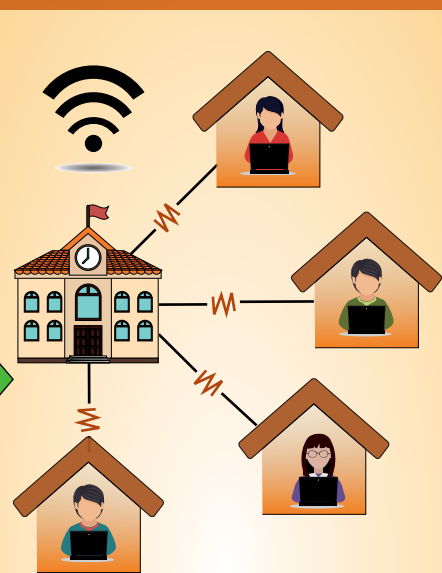
- Classroom or lab- centric
- Slow downloads with mass users
- Typically inhibited media access to small files/PDFs
- Limited based on # of users
- Some network crashes
- "Big pipe" focus (T-1 lines, etc.)
- Wired or dial-Up

Stage 2: Wireless Access Points



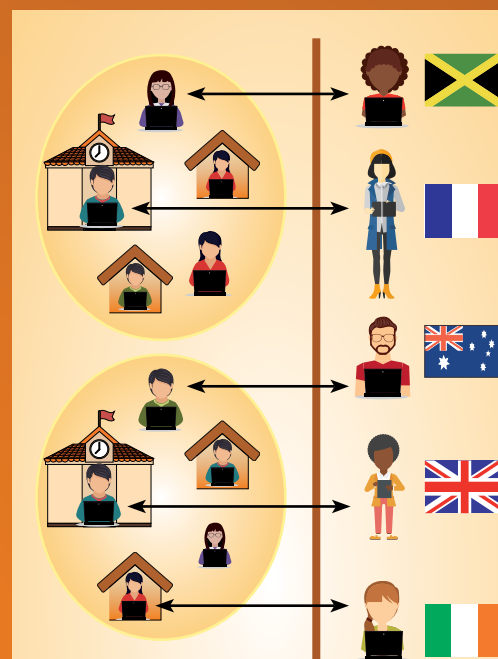
- All Access / "First-In" faster
- Teacher-centric classrooms only
- Limits on surfing and streaming (Filter blocks on YouTube/video)
- Interactive E-Books
- Links with flat content
- Simple downloads
- Google Docs/Office 365
- Wi-Fi at 2.4 GHz on 802.11b/g
- Unreliable/Lots of network crashes

Stage 3: Institution-wide Wireless/Remote



- Teacher-centric & common areas
- Some streaming
- More Courseware & denser files
- Supplemental learning objects used
- Remote access
- Video/everyone streaming
- Multi-devices
- Digital Collections, Skype, any gaming learning
- WiFi 2.4 GHz on 802.11b/g/n
- More access points

Stage 4: Social/Community Wide



- Access supports beyond institution to social community. Greater density comes into play
- Parental and industry access
- Infrequent multi-modal and remote users
- Uninterrupted video streaming and conferencing
- Remote collaborators in other schools and nations
- Wi-Fi at 5 GHz on 802.11n/ac Wave 1

Stage 5: High Density Net Ecosystem



- Web 3.0. Internet of Things. Access supports virtual teaching—special subjects and many devices/ objects
- Always-on high frequency multi-modal video streaming
- Dense courseware and animation graphics creation
- "Binge-On" Invisible Net Ecosystem
- Extra-Limital Learning
- Sophisticated internal and visitor access
- Uber connectivity—multi-device/objects
- Wi-Fi at 5 GHz on 802.11ac Wave 2 ↑

80% Of schools cite they can deliver common area access. This is where most schools stand today

5 Billion Households with school-aged children do not have access to the internet

75% Of school systems surveyed do not have any off-campus strategies for providing connectivity to students at home and after school

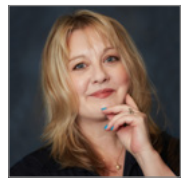
80% Of schools cite institution-wide network but it is inadequate for burgeoning use of digital curriculum

"Unreliable" Opinion of most instructors surveyed about their Networks

Sources: Learning Counsel Digital Curriculum Strategy Survey and Assessment Tool 2016; Pew Research Center, 2014



The Learning Counsel helps our subscribing 170,000+ education professionals in the K12 and Higher Ed sector gain context on the shift to digital curriculum. Our mission is to help districts and schools reach real transformation through strategies for digital content & curriculum. Through consulting services and research, to events, custom publishing and online editorial, the Learning Counsel provides dynamic and diverse opportunities for private and public-sector leaders to collaborate for positive change.



LeiLani Cauthen
CEO & Publisher

A Research Publisher and Media personality for 20 years, LeiLani conducts national research on digital curriculum trends and spend. She is well versed in the digital content universe, software development, the adoption process, school coverage models, and helping define this century's real change to teaching and learning.



Dr. David Kafitz
VP School Relations,
Digital Transition
Specialist

Expert and charismatic change-agent helping schools move forward with a well-reasoned strategy for digital content and curriculum, professional development and IT strategy, David is a former Superintendent, Director of Technology Services, Principal, and Teacher in North Carolina Public Schools.

the Learning Counsel

3636 Auburn Boulevard
Sacramento, CA 95821 888.611.7709
www.thelearningcounsel.com
© 2017 the Learning Counsel. All rights reserved.

11 Insider Tips to Achieving Digital Equity

- 1. Know the Scale and Where You're Headed.** If you've planned to stick with textbooks and banned computing devices, go in peace, my friend. Although, there might be crowds of glazed-eye zombie students, or those who arrive with pitchforks at your front doors in open revolt. Therefore, there is a chance you want to conform to new digital ways. To understand where you are, and where you need to go, read this paper and accompanying infographic.
- 2. Confront the Digital Equity Issue by Talking About It.** If you suspect that some students have limited access to computing devices or Internet at home, talk to them. Can every student be expected to update his or her digital portfolio outside of school? It's best to ask this through an informal and non-embarrassing method, such as "If I assign online homework, are you able to access it all the time? I know some of you stay with friends or other family after school, who might not have Internet access. Please see me after class if anything might inhibit you from accessing your homework online." This gives students a safe space to address the issue without bring embarrassed in front of classmates.
- 3. Plan for Outlandish Online Traffic.** As Bryant Wong, CTO at Summit Public Schools, recalls of his school system's 1:1 program, "When a teacher decided, 'I want all of my students to do this one thing at the same time,' everything just fell apart. Our server choked and crashed. After that, we did the math. We figured out how much bandwidth we needed to support any situation." That became a "teachable" moment for his IT organization: "You have to plan for the extreme, not for what is going to happen normally, day-to-day."¹²
- 4. Set High Expectations for Wi-Fi.** People today already believe Wi-Fi should be as reliable as carrot sticks in the cafeteria and lights in the classroom – but it isn't in most schools. The only way to transition to digital is to make networks so reliable that teachers and students have the confidence to do their work with a positive result. Sure, an unexpected military exercise that includes radio frequency could take out certain Wi-Fi signals – such as what happened in Lawrence Public Schools (KS) – or a wayward backhoe can slice a fiber cable. However, with high expectations being delivered on for most situations, you have the potential for transformative results.
- 5. Don't Be Fooled.** There are a ton of not-quite-as-good devices and network hardware on the market. You can confidently plan for resiliency at every stage of your infrastructure design—by choosing reasonably priced devices and best-of-breed network components that offer clear technical advantages. But to be safe, keep extra access points around in case one goes out and run a secondary link to an alternative Internet Service Provider (ISP).
- 6. Continue Pushing the Budget Changeover.** Move funding away from paper and textbooks and into digital. Per findings from the Learning

Counsel Survey, the market "flipped" in 2016. An estimated \$2 billion shifted to over-arching district-level spend on digital curriculum, when it was previously being left to random teacher and school-level discrete spending. The same study showed that eighty percent of school resource budgets are still going towards paper textbooks – so districts, in the majority, while starting to "go digital," are spending billions on traditional paper and pencil learning. This is the "squeeze" every school feels right now — the dual-track of spending on resources. Spending on learning content is, typically, the second highest spend area after employees for schools, so, as billions more gets shifted, the entire market will see a change in digital content quality and a scale of network demand unlike any other industry.

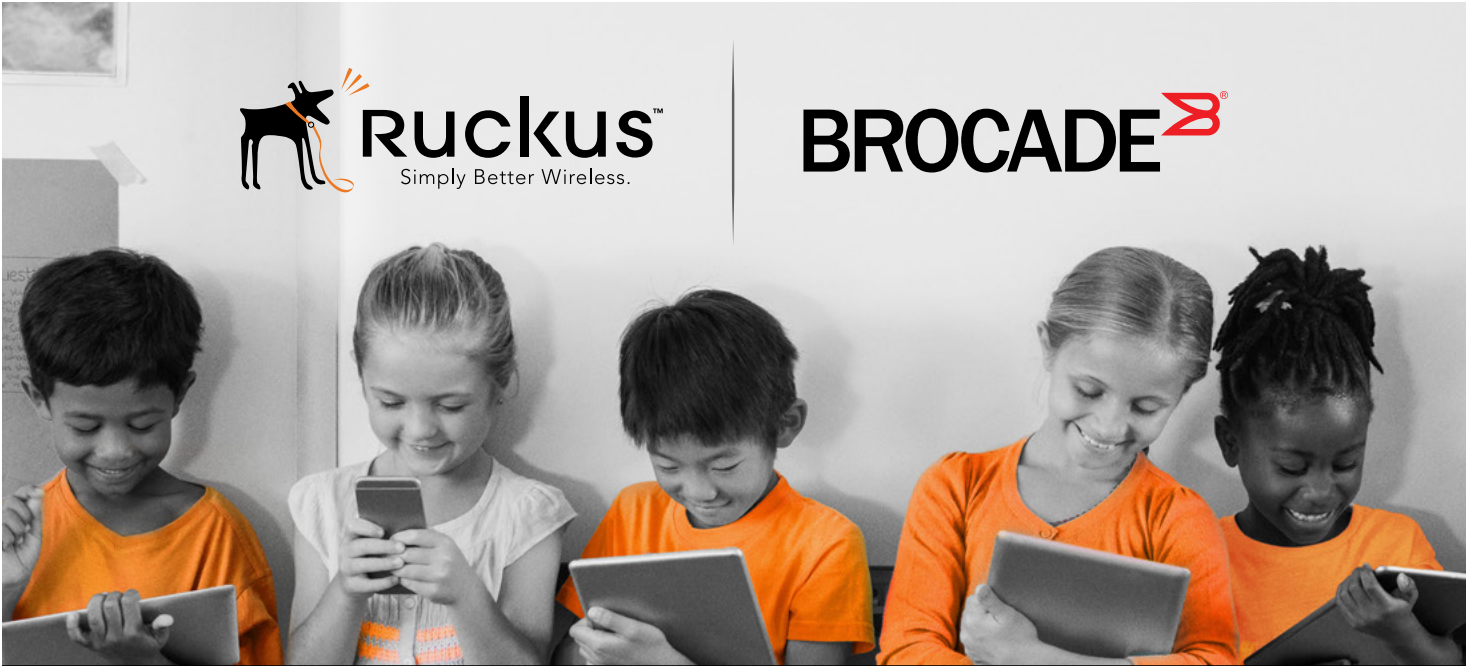
- 7. Claim your Cash.** Federal funding by the *Every Student Succeeds Act* (ESSA) in 2016 was sadly under-claimed by many schools, and E-rate is still a major program to pay for and expand networks, especially Wi-Fi.¹³
- 8. Create Adult Play-Time.** Allow for digital access to take root by giving teachers time to learn to use digital courseware, systems and develop learning objects into lesson plans. Professional development training is nice, but it's increasingly important to mandate or at least provide device and software "play time". Figuring out how to use digital content can be complex, and modern software should help by building these tools into the navigation.
- 9. Plan for Discovery Learning.** Most jobs today contain some research responsibilities, including everything from travel planning to bio-engineering articles to the latest research about Industry markets. In K-12 learning, Internet browsing to discover and differentiate valid-source research about any subject has mostly been a province of teachers. But more schools are seeing it as a critical work skill that students must learn and do.
- 10. Get Very Serious about Security and Privacy.** Although nine out of ten respondents to the Learning Counsel survey said their districts have a student data privacy policy in place, that doesn't mean the policies are followed. Frequently, the terms and conditions of products related to data usage are so complex, few people are willing to spend time trying to understand them. For example, most schools have cited less than forty percent of their online traffic uses any sort of encryption – and most it contains private student data. Survey respondents also showed a lack of understanding of third-party algorithm use on their data. CoSN offers a "Protecting Privacy" toolkit" and online training courses.¹⁴
- 11. Choose Vendors that Can Act as Consultative Partners.** You're in the business of education, not in the business of making devices, software, or running networks. Therefore, when you go out to bid, seek companies with experience in the industry that are willing to go the extra mile to understand your district's unique needs and work hand-in-hand on-site with you. That's the best way to ensure you don't get a cookie-cutter solution, but one that's custom-designed for your district. For example, "pay-as-you-grow" programs allow a school system to start out with what's needed today, and expand as demand requires. ■

Stretch your capacity
plan to accommodate
outlandish online
traffic.

Sources

- "2016 Digital Curriculum Strategy Survey and Assessment Tool," The Learning Counsel, <http://thelearningcounsel.com/2016-survey>
- "How Can So Many Students Be Invisible? Large Percentages of American Students Perform Above Grade Level," Johns Hopkins School of Education, <http://edpolicy.education.jhu.edu/wordpress/?p=153>
- "2015 State of the States," EducationSuperHighway.org, <http://stateofthestates.educationsuperhighway.org/>
- "The Education Technology Value Chain: Implications and Policy Options," THE Journal, <https://thejournal.com/Articles/2016/08/11/The-Education-Technology-Value-Chain-Implications-and-Policy-Options.aspx?p=1>
- "2016 Annual Infrastructure Survey," CoSN, <http://cosn.org/Infrastructure2016>
- "The Broadband Imperative II: Equitable Access for Learning," SETDA, <http://www.setda.org/priorities/equity-of-access/broadband-imperativeii-2016/>
- "Millions in US still living life in Internet slow lane," Ars Technica, <http://arstechnica.com/information-technology/2016/12/millions-in-us-still-living-life-in-internet-slow-lane/>
- Lifeline Program for Low-Income Consumers, FCC, <https://www.fcc.gov/general/lifeline-program-low-income-consumers>
- Based on a Learning Counsel phone interview
- Based on a Learning Counsel phone interview
- "Gartner Predicts Fifty Percent of Citizens in Large Cities Will Share Personal Data With Smart City Programs by 2019," Gartner, <http://www.gartner.com/newsroom/id/3545018>
- Based on a Learning Counsel phone interview
- "ESSA: <https://www2.ed.gov/policy/elsec/leg/essa/index.html>
- Protecting Privacy, CoSN, <http://cosn.org/focus-areas/leadership-vision/protecting-privacy>

Underwriter for this Brief



ELEVATE THE CLASSROOM EXPERIENCE

A fast and reliable network is now a basic utility like electricity and heat, delivering a critical component of the student experience. Don't let your campus network become a roadblock—invest in a wired & wireless network that supports future ready technologies with a campus network that delivers K-12 proven performance, reliability and scale.

STAY ELEVATED WITH RUCKUS' WIRED AND WIRELESS SOLUTIONS



Broadband & Network Capacity

Ruckus offers wireless and wired networks with scalable capacity to meet the demands of digital learning rollouts, on campus or district-wide.



Student Data Privacy

Ruckus primary education solutions can provide secure device authentication, user policy definitions, safe mobile computing environments, and encrypted communication to Student Information Systems.



Digital Learning Transition

Ruckus solutions provide a continuous, non-stop wired and wireless networked learning environment that adapts to the needs of instructional technology applications and its users.

GET ELEVATED! To learn more view our infographic: <http://bit.ly/2k5Wjra>
and visit our website: ruckuswireless.com/solutions/primary-education

#RuckusElevate