Dell Power Solutions special edition

# Personalize Learning

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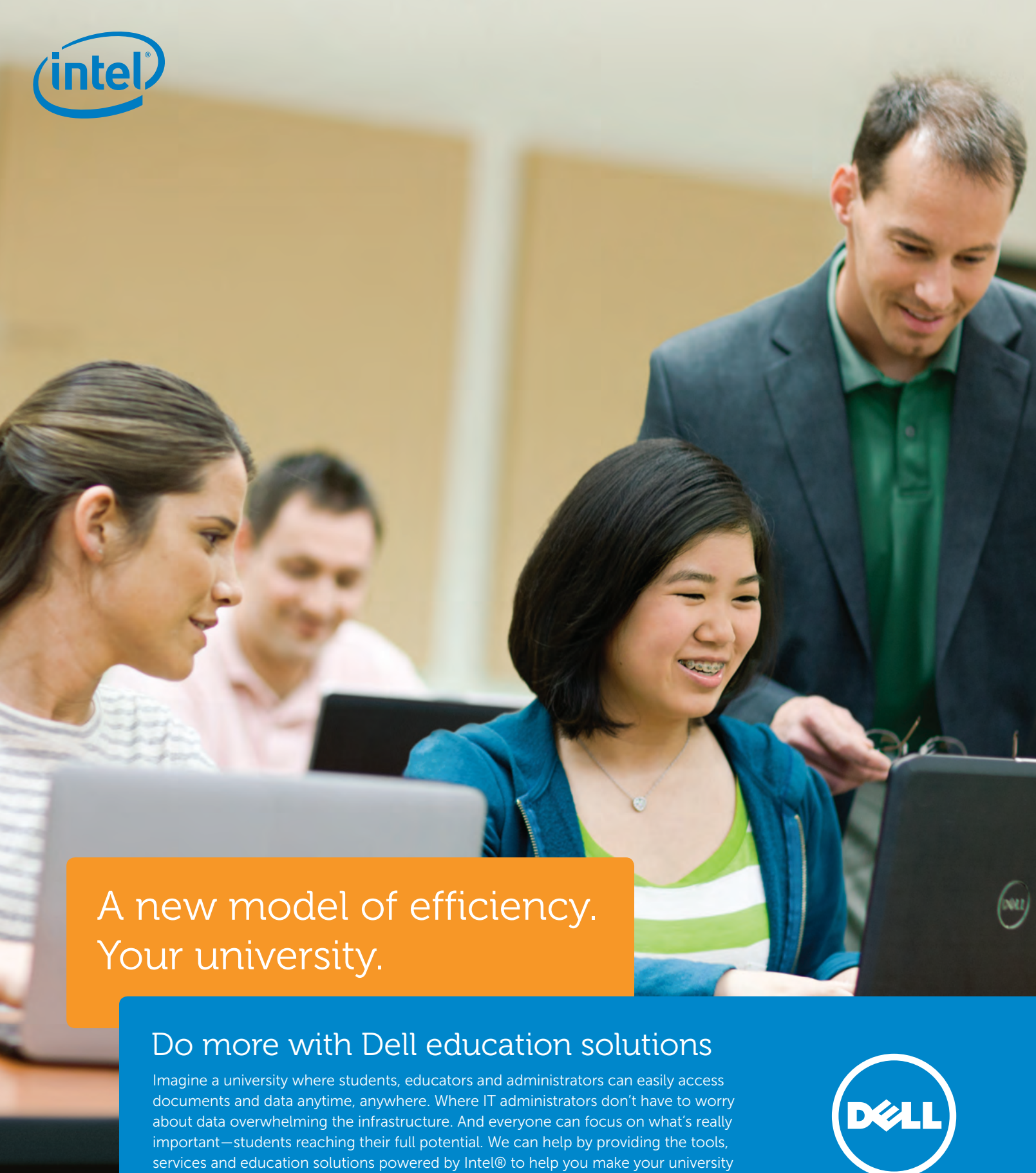
2013 Issue

## Navigating the future

*Educators are discovering imaginative new ways to spark enthusiasm and assess individual outcomes as they prepare students for a changing world*



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# Personalize Learning

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2013 Issue



### Boosting educational outcomes with an immersive learning experience

*By David Fritz*

Students of all ages and abilities love interacting with touch-based devices. The Windows® 8 Pro platform and Dell™ systems with Intel® processors make it easy to incorporate tablets in a laptop- and desktop-based environment to facilitate learning.

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*Personalize Learning* is a special edition of *Dell Power Solutions* (ISSN 2325-6281, print; ISSN 2325-6273, online), which is published quarterly by Dell Inc., *Dell Power Solutions*, One Dell Way, Mail Stop RR3-68, Round Rock, TX 78682, U.S.A. 

2013 Issue
*Personalize Learning*
special edition

DPS-201301-PL



# Boundless opportunities

Last year, our *Next Generation Learning* special edition shared many stories about the potential of technology and device innovations to enable educators to change the way they teach and the way students learn. Today, our *Personalize Learning* special edition is filled with real-life experiences of what can happen when K–12 school districts and universities take big steps toward realizing that potential.

As advanced mobile devices become readily available, educational leaders are taking advantage of the transformative effect technology has to inspire and engage students at every level. Digital content in a variety of rich formats allows teachers to seamlessly blend in-person and online instruction, creating personalized learning environments that meet individual student needs. And now, predictive analytics tools with robust data management help educators and administrators—from kindergarten through graduate school—garner timely insights into student academics, attendance, and behavior to identify problems before they escalate and help students stay on track.

In short, technology helps educators deliver on the ultimate promise of education to excite and motivate. And it is spurring students to collaborate in surprising ways as they navigate together toward a future that is still but a gleam in their eyes.

Dell is excited to work with Intel to develop innovative solutions that enable personalization. The Dell™ Learning Platform (DLP) offers a comprehensive hardware and software blueprint to facilitate blended learning in K–12 environments. The Dell Educational Data Management (EDM) predictive decision support system allows institutions to capture, store, integrate, visualize, and analyze actionable information. And Dell offers versatile, Intel® processor–based mobile devices to meet the needs of digital-age learners.

The vision of technology-enabled education that transforms lives is fast becoming a practical everyday reality. We're inspired by you, the educators, who are contemplating fascinating possibilities that redefine where, when, and how learning happens. And we're especially honored that you've chosen us as your partners in helping to make that vision come true.

Mark Horan
Vice president and general manager,
K–12 education
Dell

John Mullen
Vice president and general manager,
higher education
Dell

# Navigating the future

By Adam Garry and Jon Phillips

By blending rich digital resources, access to computing devices, and unified educational data, school leaders are discovering new strategies for personalized learning that inspire students to reach for the stars in a rapidly changing world.

Every day, the education community is producing new research on cognitive development that shows today's students are wired differently for learning. Along with curriculum strategies to heighten educational relevance, schools can foster creativity and academic achievement by integrating learning resources and device innovations that engage and motivate students. Traditional, one-size-fits-all instruction geared for set daily time periods in K–12 classrooms and college campuses is evolving into flexible, on-demand approaches that are designed to support individual learning styles beyond the classroom walls.

These approaches are reshaping the educational experience by blending in-person instruction, online instruction, and digital content in a wide range of media formats—all accessed through mobile and desktop devices. Transforming the learning environment with anytime, anywhere access also entices students to assume ownership of their education in exciting new ways—opening a world of groundbreaking opportunities for learning and collaboration across cultural and geographical boundaries.

By embracing technology, digital content delivery, and actionable student data, educators can enrich the learning process to meet individual needs. They can also use these resources to proactively determine when additional help may be required to achieve successful outcomes, and students

can use them to define their own learning paths. Technology also expands possibilities for parents, guardians, and other family members to actively participate in student education at both the K–12 and college levels—engaging in more meaningful ways than simply reviewing an online report card, for example.

## Technology framework for innovation

The evolution of data-driven blended learning spurs K–12 school districts, colleges, and universities to assess, plan, and implement a suitable IT infrastructure that seamlessly supports innovative educational approaches and paves the way for personalized learning. Students, educators, and technologies all play pivotal roles in personalized learning:

- **Students** are encouraged to choose their own learning paths and decide how they will show mastery throughout their learning journey.
- **Educators**, along with administrators and district leaders, can analyze data from student information systems and other online sources to deepen insights and help tailor the learning experience.
- **Technologies** including adaptive digital content; innovative instructional tools; and intelligent, powerful, flexible, and standards-based mobile devices allow educators to more easily differentiate instruction that meets individual student needs than they can with traditional tools.

Personalized learning involves a continuum of cohesive resources, integrated devices, intuitive interfaces, actionable data, and professional learning methods. Utilization of the backward design—a curriculum design method that involves setting goals before opting for instructional methods and means of assessment—helps educators to personalize the learning experience.

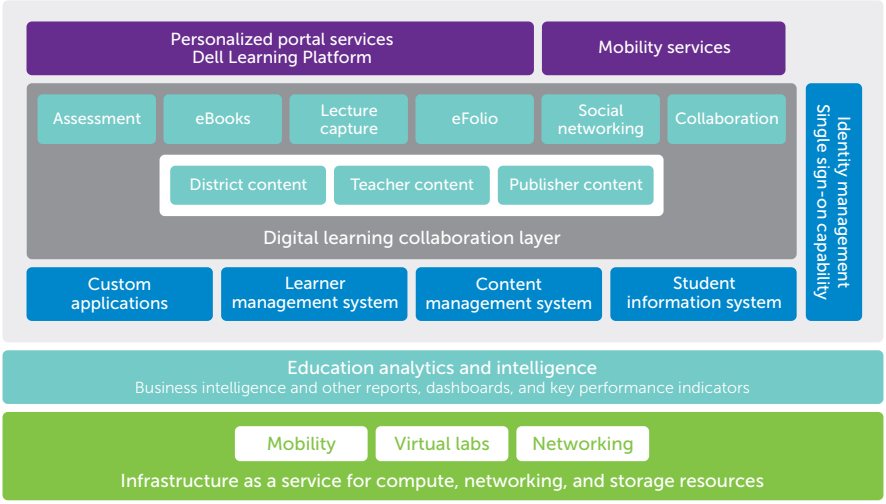


**Figure 1.** The Dell Learning Platform: A Dell and Intel–developed blueprint for advancing innovative educational initiatives

In addition, Dell and Intel have refined an approach to education that is embodied in the Dell™ Learning Platform (DLP) in K–12 and the Dell Educational Data Management (EDM) predictive decision support system. Dell also offers a variety of tablet, laptop, and desktop devices powered by Intel for educational environments. (See the sidebar, "Evolving education.")

Dell developed the DLP in collaboration with Intel to offer a comprehensive hardware and software blueprint to facilitate personalized and blended learning capabilities in K–12 environments (see Figure 1).[1] Dell and Intel are exploring similar road maps for K–12 and higher education that utilize approaches designed to meet the needs of all levels of education. The EDM system, also developed in collaboration with Intel, provides an integrated system that enables K–12 and institutions of higher learning to capture, store, integrate, visualize, and analyze actionable data.

## Effective experiences in personalized learning

Blended learning provides the foundation for personalizing the educational experience. By combining in-person and online instruction, and by utilizing rich content from multiple sources in a range of formats, educators can develop lesson plans to suit individual learning styles. For example, some students might collaborate on a project in the classroom while videoconferencing with team members who are studying at home on that particular day. Other students may use interactive software that adapts on the fly to their individual responses.

Recent research and reporting offer insight into how blended learning helps improve student outcomes. In a 2011 study, algebra-ready eighth-grade students attending schools that did not offer Algebra I courses engaged in blended learning by taking an online Algebra I course. In the report from the Institute of Education Sciences, students taking the online Algebra I course outperformed students taking Algebra I in traditional classrooms based on achievement at the end of grade 8.[2]

In another example, Hall County Schools in Georgia undertook an initiative to provide its students and educators with

[1] For more information on the DLP, see "Building blocks for blended learning," by Adam Garry, in *Dell Power Solutions*, 2013 Issue *Personalize Learning* special edition, qrs.ly/32322bd.

[2] "Access to Algebra I: The effects of online mathematics for grade 8 students," Jessica B. Heppen, Kirk Walters, Margaret Clements, Ann-Marie Faria, Cheryl Tobey, Nicholas Sorensen, and Katherine Culp, Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education, NCEE 2012-4021, December 2011, ncee.ed.gov.

## Sparking collaboration

Student excitement can be ignited in a personalized learning environment that enables educators to track individual progress and adjust the curriculum to meet individual needs. View this video to discover how Hall County Schools created an interactive, collaborative learning environment for students and educators.

qrs.ly/l2322bw

a next-generation learning and teaching environment. The environment included personalized and blended learning, and preliminary data indicates that teachers are seeing increased engagement and successful outcomes in student learning.

Higher-education institutions are also looking to implement technology that not only personalizes learning but also helps minimize the expense of attending college. For example, Southern Illinois University (SIU) plans to launch a program that equips incoming freshmen with Dell Latitude™ 10 tablets powered by dual-core Intel® Atom™ processors and running the Windows® 8 platform. The devices are expected to enable access to electronic textbooks, which helps reduce the significant cost often associated with printed textbooks. In addition, mobile access capabilities can extend the learning experience well beyond the lecture hall.[3]

# Evolving education

As providers of leading-edge technology and advanced solutions, Dell and Intel are both committed to working with educators to drive innovation that helps transform education. Both organizations are engaged in collaborative efforts aimed at helping educators transition to blended and personalized learning environments. And each has a long-standing history of delivering personal computer and server technology that is tailored to the needs of education. Recent examples of Dell offerings powered by Intel enable the following key benefits:

- **Highly interactive experience:** The Dell Latitude 10 tablet powered by Intel is designed to take full advantage of the touch-screen capability in the Windows 8 platform.
- **Robust collaboration:** The Dell Latitude 3330 laptop powered by Intel Core™ processors offers Bluetooth® support and optional mobile broadband for versatile connectivity options and rich multimedia features.
- **Flip-and-fold productivity:** The Dell XPS™ 12 Ultrabook™ and tablet system powered by third-generation Intel Core processors provides an innovative form factor that enables students to easily convert it from a laptop to a tablet.

In addition, the Dell Assistive Technology Service, developed in collaboration with Intel, provides access, procurement, implementation, and support services that help students with special needs use personal computers equipped with assistive technology features and options. These devices and innovative tools for learning give students with special needs the opportunity to reach their full potential.

To effectively implement personalized learning, schools need to unlock stored and siloed data, enabling educators to draw upon a cohesive, reliable source of information for timely insights to guide intervention when necessary to help students achieve successful outcomes. As a result, infrastructure that enables the collection, storage, and analysis of data is an important part of personalized learning, and Dell is helping educators develop these capabilities.

For example, Dell Services recently helped the University of Kentucky deploy a predictive analytics platform and develop a student retention analytics model that can be used to analyze and predict the likelihood of graduation for students. Educators and advisors can turn information into action by identifying students who show early signs of needing help and highlighting specific areas of concern. The analytics infrastructure is designed to provide self-service tools, along with the capabilities to review predicted graduation scores and preemptively recommend advisor sessions. Real-time data that is personalized and available to advisors helps students advance in their academic careers and encourages engagement with the university in new, innovative ways.

### Transition to a blended environment

A suitable blended learning environment depends on several factors, including the current IT capabilities of a school district or university, tolerance for changes to the status quo, and overall curriculum strategy.

A comprehensive transition strategy encompasses the following considerations: establishing a vision, building a strong IT infrastructure, and preparing for implementation. This last phase includes instituting a network access model and addressing professional learning requirements. (See the sidebar, "On a

[3] "SIU launches campus-wide tablet initiative," by Christi Mathis, *The Saluki Times*, Southern Illinois University, January 2013, qrs.ly/sd322bt.

## On a mission

Saint Paul Public Schools, an urban district in the Twin Cities of Minnesota, serves a highly diverse student population. Among its 39,000 students, more than 100 different languages and dialects are spoken, and 72 percent of the children are eligible for free and reduced-cost lunches.

While some segments of the student body are successful, other groups have struggled, according to Stephen Hoffman, assistant director for academic innovation and technology integration. "Minnesota is a high-graduation state, but our urban school district is looking at an achievement gap for our students from diverse ethnicities. We have students walking out the door and saying, 'I'm not interested in your education anymore. I'll go someplace else or just drop out.'"

The district considered a different type of educational environment that could enhance learning experiences for the students it was losing. It started developing an individualized approach that stressed personal, blended learning; digitized content; enhanced access to mobile devices; and flexible scheduling.

"We're moving away from schools that start at 7:30 and end at 2, Monday through Friday, with a summer break, where time is constant and learning is the variable," says Hoffman. "We want the opposite: for learning to be constant and time to be the variable. It's about removing barriers that get in the way of student learning."

mission," to discover what motivated one school district to transform its infrastructure in support of a blended learning environment.)

Establishing a vision with strong, specific learning objectives helps educational leaders reevaluate how learning should occur. One creative way in which K–12 school districts can begin this vision is by holding a *visioning day* event that is dedicated to aligning stakeholders. Developing a communication plan helps ensure that the strategy continuously meets the needs of stakeholders throughout the process.

Creating a strong technology infrastructure forms the foundation for an efficient system of blended and personalized learning. Often, an assessment of the existing IT environment is a key first step in identifying inefficiencies and avoiding duplication. The result should produce a road map for infrastructure investments required to help fulfill the vision.

Network access is an important consideration for school districts, colleges, and universities. The IT infrastructure must be able to meet the demands of devices requiring high-speed, Wi-Fi® connectivity. While K–12 schools are working to find the right balance of school-provided device versus bring-your-own-device (BYOD) strategies, many institutions of higher learning are starting from a BYOD perspective. Either way, the network access model must facilitate people and processes as well as technology.

Professional learning should be at the center of the plan to promote understanding and efficiency, helping educators make the most of technology and device innovations and apply best practices to personalized instruction.

### Rich educational outlook

Blended learning environments are particularly well suited to the changing ways in which technology and digital content pervade everyday life. Online instruction, mobile devices, assistive technologies, and other innovations blended with traditional classroom instruction introduce fresh opportunities to build enthusiasm. Personalized learning frees educators to customize curriculums that help make learning come alive for each student rather than implementing one-size-fits-all lesson plans geared for presenting the same content at the same pace to a group of students.

To provide an effective foundation for blended and personalized learning, K–12 school districts, colleges, and universities need to incorporate the requisite IT infrastructure refinements into their curriculum strategy. Dell works extensively with educational organizations worldwide and strategically with Intel and other organizations to develop solutions that help educators put their vision of a rich learning environment into action today. PS

## Authors

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# A vision for change

By Adam Garry and Snow White

The ability to create learning environments that meet the needs of today's students begins with a vision of what learning should look like. Together, educators and IT leaders can transform learning to support blended and personalized environments.

Personalized learning calls for profound changes that recast the educator's role from chief content expert to facilitator of student mastery. By blending conventional classroom instruction, rich online content, and digital data resources, educators encourage self-directed learning by putting students in charge of the time, place, path, and pace of their education.

Technology innovations, from smartphones and tablets to virtualization and cloud computing, have put education on the fast track to personalization. Mobile devices, now a part of everyday life, allow students to interact, collaborate, and develop their creative potential anytime, anywhere. Equally important, the right investments in IT infrastructure and professional learning, reinforced by cohesive best practices, prepare the way for educators to translate their strategic vision for personalized learning into practical reality. Educators moving toward a personalized learning approach can think about the plan suggested here as one possible road map.

## Lead by establishing a vision

Thought leaders are essential in effecting these groundbreaking changes. At all levels, educational and IT leaders need to rally support for the transformation to personalized learning and spark enthusiasm among stakeholders. Everyone committed to making a successful transition can share in the zeal of applying technology to transform learning.

One way to build support is to set aside a *visioning day*—not only to spread excitement for the change, but also to invite feedback and suggestions. Educators, principals, administrators, and other faculty should be welcome along with students and parents or guardians. Participants can engage in conversations within the community and discuss the evolving nature of how students learn and its impact on the school system.

Establishing a vision with strong learning objectives helps educational leaders rethink how learning should occur, and effective communication helps ensure the strategy meets the needs of stakeholders throughout the process. Access to information is essential to meet the needs of today's learners, and a strong infrastructure forms the foundation that enables culling selected resources to personalize learning. For example, given the influx of devices requiring high-speed Wi-Fi® connectivity, K–12 schools, colleges, and universities should be well equipped to meet the demand both securely and reliably.

## Turn the vision into reality

Transforming the existing IT infrastructure into a framework that supports personalized

learning brings the vision to life. Stakeholders can develop a digital content and curriculum strategy, determine the IT infrastructure and network access model, and address professional learning to familiarize educators with the technology.

### Digital content and curriculum

Creating and adopting an integrated learning platform is key to a successful transformation. The learning platform should offer a suite of tools that students, educators, administrators, parents, guardians, and other stakeholders can use to connect with each other and access information. A digital repository is a primary component that stores the district's or institution's digitized curriculum. Master or core classes may be aligned to Common Core State Standards (CCSS) for K–12. Course materials may include educator-created videos, lesson plans, assessment tools, and other digital learning objects—already vetted so that only highly effective educational resources are available. Ensuring these systems can share information is important so that educators and students can personalize learning by using many systems working together.

### IT infrastructure and network access

Educational institutions need to determine how they can ensure that all students have access to digital resources. School districts moving toward a bring-your-own-device (BYOD) model will likely need to provide devices for students who do not have their own. Other districts may elect to provide devices for an entire student group, and many may have a goal to ensure equitable access to the Internet. Higher education, which has traditionally allowed BYOD access, should make sure that the network can handle the increasing complexity inherent in accessing and managing many different devices. Some institutions of higher learning may also be considering supplying devices to all students.

Often, a hybrid access model that may include a mix of these options is adopted. The IT infrastructure must support an access model that enables students who do not have Internet access at home to utilize extended hours at any school in the district as well as wireless hot spots in the community. This approach should allow students to sync their devices before and after school so they can access learning materials offline.

### Professional learning

K–12 school districts and higher education institutions should develop and deliver personalized learning plans for professional growth, just as they provide personalized learning for students. In the same capacity that students need to take ownership of their learning, educators can take ownership of their professional development. School districts, colleges, and universities can develop, plan, personalize, and implement instructional strategies with their staff by establishing a comprehensive, data-driven portfolio of information.

Providing various means of access to this information and opening opportunities through blended learning methods are important for the collaboration necessary to progress toward desired outcomes. Leadership development, coaching and modeling, professional learning communities, training, speaking engagements featuring real-world perspectives, and online resources offer several examples that facilitate sharing, discussion, and collaboration. These strategies enable educational institutions to support measurable, sustainable gains in leadership, teaching, and learning.

## Build on the vision

Assessing the IT environment is an important step in identifying inefficiencies and discovering strategies to help reduce costs. A vendor can provide this assessment, or the district or the institution can provide it. The goal should be to create a road map for procurements that support the vision.

An integrated approach to storage and data management, networking, systems management, and security are common investments to optimize services 24/7 and provide the opportunity to scale. Other considerations can be alternative hosting options such as a cloud computing model, which heightens flexibility at a low cost. For example, managed services may efficiently offload day-to-day management tasks and optimize IT resources.

## Expand the vision

By embracing technology and device innovations, educators can work with IT leaders to drive significant curriculum changes designed to give students the tools they need to prepare for college or careers. The blended learning approach empowers educators to create personalized experiences that excite students about learning—and life—as they head toward successful outcomes that surpass today's imaginings. PS

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# Boosting educational outcomes with an immersive learning experience

By David Fritz

Students of all ages and abilities love interacting with touch-based devices. The Windows® 8 Pro platform and Dell™ systems with Intel® processors make it easy to incorporate tablets in a laptop- and desktop-based environment to facilitate learning.

Schools have rapidly embraced mobile computing platforms to complement desktop devices. And no wonder. The rising popularity of tablets gives educators an opportunity to extend absorbing, go-anywhere experiences that accelerate learning outcomes. Students—especially K–12 learners—enjoy interactive, instant-on, touch-screen displays.

Despite their charm, tablets are better suited to some educational purposes than others. To determine the appropriate types of devices to deploy in a school's computing environment, K–20 institutions must first identify key factors such as desired student learning outcomes and instructional goals. For example, consider young learners in early elementary school who have not developed typing skills. They can benefit from the multitouch, content-consumption features of a tablet when using a math app or an Adobe® Flash®–based learning Web site. Teachers can connect tablets to classroom peripherals such as projectors and document cameras; the tablet's long battery life avoids the need to disrupt valuable classroom time hunting for power cords. And students with special needs can benefit from easy-to-hold tablets that offer the requisite connectivity and software to support an inclusive environment for all learners. They become empowered to engage, communicate, and collaborate using the same devices as their peers.

In contrast, a high school or college student using advanced computer-aided design (CAD) tools in a lab might require a desktop computer with high-end processing performance and graphics. And a university administrator who uses office productivity software but also needs to check e-mail or view presentations on the road may find that a laptop or a convertible tablet–Ultrabook™ form factor offers the desired blend of functionality and flexibility.

Institutions need to also examine the impact of device technology on IT support and overall total cost of ownership (TCO). For example, some tablets are designed as single-person, home-use devices and may lack the security and management capabilities required to support multiple users, enforce school policies, and integrate with existing infrastructures. IT staff may need to find alternate approaches and tools for managing these types of tablets. Moreover, some tablet platforms may require schools to purchase additional software licensing and applications for them to work properly with a school's network.

The release of Windows 8 Pro provides organizations with expanded flexibility and choice when considering touch-based platforms for student, teachers, and administrators. Optimized for touch, the Windows 8 Pro platform enables client

## Inspired design for education

The right tools help personalize learning as well as boost operational and IT efficiency. Dell offers a variety of client devices powered by Intel processors. Running Windows 8 Pro, these devices are designed for a smooth, versatile experience at school, home, and everywhere in between.

Dell Latitude 10 tablet

Dell Latitude 3330 laptop

## Advancing learning productivity

See how students and teachers can enhance educational potential through the agile Windows 8 touch experience on the Dell Latitude 10 tablet's capacitive multitouch HD display.

qrs.ly/sc322b1

devices to be easily integrated into institutional networks, as well as the management infrastructures already in place at many schools. Windows 8–based devices also are designed to work with existing Windows 7 software and peripherals—minimizing the need to invest in new applications or upgrades.

## Combining a rich student experience with institution-grade functionality

Windows 8 Pro offers key functional and IT-related capabilities that make it well suited to power computing devices for education.

### Common user interface across platforms

When deployed across a range of client platforms, Windows 8 Pro offers a user interface that is designed to provide a personalized, consistent digital learning environment. For example, to augment a particular lesson an educator may post content on the school's social network. With Windows 8, students and teachers can view this information through a personalized user interface that is consistent across desktop, laptop, and tablet devices.

The Windows 8 live tile feature facilitates fast, efficient social collaboration by automatically displaying real-time updates to a school's social network, such as a new post regarding a shared project. The live tiles appear on the start screen of Windows 8 devices and even provide a common user interface across the Microsoft® Xbox® video gaming system and Windows Mobile Phone.

### Multitasking between apps

Windows 8 enables users to view and work with apps side-by-side to heighten productivity and personalized learning. End users can run a primary app while snapping a second app so that it appears on the side of the screen.

For example, while viewing an online lecture on a tablet through Skype™ software, students easily can take notes using the Microsoft Word or Microsoft OneNote® application on the same screen. Also, the ability to run multiple applications supports the inclusive nature of the device, allowing students who need specialized accommodations, such as speech-to-text software, to complete projects in class.

### Enhanced search

As social media becomes a common means for teachers and students to communicate both inside and outside the classroom, Windows 8 makes it easy to locate relevant resource materials through the search-within-application feature.

For instance, to augment a science lesson, a teacher posts a video about genetically modified food on a classroom's social collaboration site. A few weeks later, students are asked to write a paper on organic farming. Instead of needing to download the video when it first appeared or flip through multiple postings on the social collaboration site, a student can type in the term "genetically modified food" on a Windows 8 device, which then searches through the apps and live tiles for related content.

### Flexible input

Windows 8 toggles easily between two input modes: an immersive multitouch-based interface and a traditional point-and-click desktop user interface that leverages the tablet productivity dock or a portable tablet keyboard. This flexibility provides a user experience that can be optimized for content creation or content consumption, depending on student and teacher needs.

### Secure access with domain join

To help simplify device management, the domain join capability connects Windows 8 Pro devices to the institutional network through the Microsoft Active Directory® directory service. Domain join also supports a personalized learning environment. For example, in a one-to-many deployment, tablets are shared at different grade levels and for different subjects. Through domain join,

Dell Latitude 6430u Ultrabook

Dell XPS 12 convertible Ultrabook

Dell XPS One 27 all-in-one desktop

a student can sign into a shared tablet and receive a specific set of applications, documents, favorites, and network drives, based on a user profile established in Active Directory. Domain join also allows teachers and administrators to securely access school networks and applications from home.

### Smooth app management

Windows 8 Pro allows IT to install applications directly to a device without going through the Windows Store, leading to efficient and controlled deployment of modern Windows 8 Pro apps. Moreover, Windows 8 Pro devices are designed to be compatible with a district's legacy applications and content, including Adobe Flash media. This compatibility enables districts to protect their investments in digital content. And Windows 8 Pro tablets can be preloaded with existing applications such as Microsoft Office using the licensing model already in place for laptops and desktops.

## Opening a world of personalized learning

Dell offers a range of mobile and desktop client devices that enable K–12 schools and universities to take advantage of Windows 8 and choose the technology appropriate for the desired educational outcome. (For more information, see the sidebar, "Ready, set, go!")

Tablets are designed primarily for content consumption, delivering an engaging touch-screen experience for interactive learning. The Dell Latitude™ 10 tablet—powered by the Intel® Atom™ processor Z2760—features a Corning Gorilla Glass multitouch display in a reinforced magnesium alloy frame for enhanced durability in demanding school environments. Latitude 10 tablets are designed to boot in seconds, so students can quickly get ready to learn. They also feature a long battery life that minimizes time between recharges and helps prevent interruptions in class. The Latitude 10 expands to a traditional desktop setup with an optional productivity dock. Four USB ports allow quick connections to a USB memory key, printer, document camera, assistive technology peripheral, or other device.

Lightweight, durable, and compact, Ultrabook systems are a portable choice for content creation and collaboration capabilities. Featuring a 14-inch display, the Latitude 6430u Ultrabook—powered by Intel Core™ i3, i5, or i7 processors—provides the power and features of a traditional laptop in a sleek form factor. This Ultrabook model has been MIL-STD 810G tested for rugged durability. In addition, optional Intel vPro™ technology enables advanced management and remote troubleshooting capabilities for school IT departments. Intel Rapid Start Technology is designed to bring the Ultrabook from deep sleep to fully awake in less than 7 seconds, providing an ultraresponsive experience.

Laptops offer agile performance as well as mobility. The Latitude 3330 laptop with Intel Core i3, i5, or i7 processors is a cost-effective, business-class device that is designed for advanced manageability, supportability, and security. The Latitude 3330 features a 13.3-inch HD display, which exceeds the minimum screen-size guidelines for Common Core State Standards, as well as a full-size keyboard that together are well suited for content creation.

Combining the interactivity of a tablet and the power of a laptop is the Dell XPS™ 12 convertible Ultrabook with Intel Core i5 or i7 processors. It features an innovative flip-hinge design for smooth conversion into either tablet or laptop mode. Convertible tablets such as the Dell XPS 12 are an excellent platform for note-taking and classroom evaluations as well as intuitive content browsing.

Desktop computers shine in laboratories and classrooms where students need high-end graphics and/or powerful processing for complex software. The Dell XPS One 27 all-in-one desktop with Intel Core i5 or i7 processors offers exceptional performance and audio and graphics capabilities. With a 27-inch Wide Quad HD (WQHD) screen, the XPS One 27 is well suited for specialty applications such as video and sound editing.

Using the same Windows 8 platform, Dell client devices for education offer a familiar user interface and can be managed using common tools and expertise—enhancing the end-user experience while streamlining IT management. This common platform enables schools and universities to easily augment the learning environment with touch-enabled devices such as the Dell Latitude 10 tablet. By matching client device types to specific educational objectives, organizations can heighten learning productivity and keep IT operations efficient. PS

## Ready, set, go!

When they're not in use, mobile devices such as laptops, Ultrabook systems, and tablets need a protected location where they can charge and be ready to go. The Dell Mobile Computing cart is designed to securely store, charge, and transport mobile devices. It provides easy mobility to share devices between classrooms and configurable shelving to accommodate a variety of form factors.

A managed version of the cart offers the ability to remotely manage laptops and Ultrabook systems. For example, Wake-on-LAN functionality allows administrators to program laptops and Ultrabook systems to wake up at a specified time, such as 15 minutes before the start of the school day. The managed-cart option also enables software updates to be delivered remotely while the devices are locked up and charging.

## Author

**David Fritz** is an end-user computing strategist for Dell working on solutions for educational and state and local government organizations.

## Learn more

**Dell Latitude 10 tablet:**
qrs.ly/4c322b3

Hall County Schools

# Building blocks for blended learning

A Georgia public school district shares its blueprint for using the Dell™ Learning Platform to engage students through a transformative blended and personalized learning model.

Blended and personalized learning makes it possible to restyle today's K–12 classroom into the cutting-edge digital environment required for student success in college and the global workforce beyond. The blended learning model combines in-person and online instruction to extend and expand the learning process beyond a traditional classroom's time and space confines. In this environment, students can access formal and informal learning opportunities 24/7, as well as take advantage of social and collaborative tools.

A blended learning environment is an important part of the foundation for personalized learning, which allows students to actively take responsibility for their own learning. Personalized learning focuses on individual preference in how students learn and how they demonstrate that learning. Teacher guidance and technology are both key to the customization of resources and efficient pacing required for successful learning outcomes.

## Harnessing technology to augment learning potential

The Dell Learning Platform, developed in collaboration with Intel, enables a blended and personalized learning model by helping simplify both information and learning management. The platform is one of several solutions built through the commitment of Dell and Intel to work with education communities around the world. This collaboration delivers transformative technology and educational resources designed to enrich the teaching and learning experience.

## Making it personal

Dell, with ongoing support from Intel, continues to enhance core capabilities of the Dell Learning Platform with features such as digital portfolios and extended opportunities for personalization.

Digital portfolios, also known as e-portfolios, let students collect, organize, and show evidence of their work at various stages by digitizing and archiving it in a single repository. E-portfolios encourage students to take responsibility for their own learning because they can trace and reflect on their progress and build a plan for going forward. The e-portfolios also allow students to receive feedback on submitted work, as well as serve as resumes to help students advance into college and career opportunities.

Enhanced personalization capabilities allow students checking their assignments on the Dell Learning Platform to access resources that best fit their learning modalities and preferences. For instance, when working through a unit on simple machines, students might click on the state academic standards for that topic, and choose 7 of 15 resources available. They can then drag and drop these resources onto their individualized learning path screens, which go to the teacher for approval.

Other platform features address school-specific needs from access and safety standpoints. For example, the single sign-on (SSO) capability helps simplify access, allowing learners to maximize time on tasks and minimize the need for IT support. And from an administrator's perspective, identity management capabilities that work with existing school applications ease concerns about interoperability issues and compliance with the Family Educational Rights and Privacy Act (FERPA), Children's Internet Protection Act (CIPA), and other directives protecting student privacy.

The Dell Learning Platform integrates such commonly disparate elements as the student information system, grade book, digital content resources, and applications into a single interface. This interface is optimized for desktops, tablets, and mobile devices to support a range of blended learning models, including a bring-your-own-device (BYOD) strategy. Dell integration and deployment services can customize the learning platform for a district's specific requirements, applications, and content.

The Dell Learning Platform plays a pivotal role in personalized learning environments as the hub for communication, management, and content for education stakeholders. Role-based dashboards customize screen views and features for end users. Students can access course syllabi, daily work, quizzes, projects, collaboration tools, and other personalized elements relevant to their classes. They can also utilize e-portfolios to track and show their learning over time. (For more information, see the sidebar, "Making it personal.")

Teachers can stay organized and respond to students in a timely manner with grade book, assignment posting, and progress report features, among other capabilities. And administrator dashboards provide a broad perspective of student progress across classrooms and subjects—allowing them to acknowledge student and teacher accomplishments and connect with colleagues in other locations.

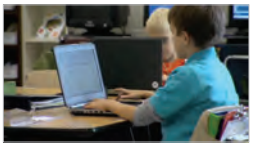
### Pioneering a blended learning environment

When Hall County Schools in Georgia made the decision three years ago to transition from a traditional classroom environment to a blended learning model, the change was to a great extent inspired by students. The district realized that its student population was using personal electronic devices to consume and produce information outside of school in ways that were very different from what was happening inside of school. The district ultimately recognized that instead of banning personal devices, it needed to embrace them as a key piece of the learning environment. "The message from students was clear: the world has changed, and so have we," says Will Schofield, superintendent of the 32-school, 26,000-student K–12 district.

The vision Hall County education stakeholders agreed on was a personalized approach to learning that is asynchronous, individualized, and student-centered, says Aaron Turpin, Hall County's executive director of technology. In 2009, Hall County Schools, with help from Dell and Intel, developed HallConnect, a version of the Dell Learning Platform that was customized to the district's specific needs. Offered as an opt-in model, Hall County's blended learning program grew from 12 teachers to 350 in just three years. Turpin says results have been nothing short of "phenomenal."

### Engaging in self-directed learning

Evidence of such stellar results can be seen in the sixth-grade language arts classroom of Teri Lance, who teaches at Hall County's C. W. Davis Middle School. Since employing the blended learning model and integrating HallConnect, Lance's students have



## A matter of course

Hall County Schools created an interactive and collaborative learning environment for students and educators with HallConnect. View how students benefit from a personalized learning experience where educators can track an individual's progress and adjust the curriculum as needed.

qrs.ly/9d322au

demonstrated increased proficiency in language arts on the Georgia Performance Standards (GPS) state test—from around 85 percent to 100 percent.

Lance credits this student achievement to a high level of engagement, variety, and choice in learning, as well as easy progress monitoring. Through HallConnect, students receive deeply personalized instruction tailored to their specific learning strengths, interests, and skill levels. For example, students may gain knowledge through a teacher during class or from an e-mail exchange, or they may use the platform to explore a Web site or read a book.

The learning platform also makes it easy for students to track and redo assignments and tests to raise their grades—key to encouraging mastery of learning. Brianna, a student in Lance's class, says the color-coded progress-monitoring system, which includes assignment and test due dates, really helps her stay organized. And Lance says the self-pacing facilitated by the blended model inspires student engagement and independent task completion, freeing her to work with struggling learners who need one-on-one attention.

HallConnect also enables independent, self-directed learning by allowing students to collaborate with peers and access study materials anytime, anywhere. For a unit on verbs, says Brianna, the teacher posts students' journal notes, which they can review as many times as they like before retaking the test. Brianna says she also checks her assignments and grades on weekends if she's been out sick or hasn't had time during homeroom.

### Building college and global workplace skills

The district is rolling out curriculum to meet the Common Core State Standards in English language arts and math and tapping into what Turpin terms "the collective genius" of its teachers to develop master courses in these areas. These courses are posted on HallConnect for download and customization by teachers.

Spanish class teacher Wes Vonier says HallConnect helps students develop interpersonal communications and presentation skills, which the standards identify as key to foreign language mastery. For example, through HallConnect and its software resources, students can craft and upload audio and video presentations.

Chestatee High School senior Ashlee says she and other members of the school's extracurricular book club use HallConnect to create book trailers through a process involving storyboards and animation software. The book club meets only once a month, but HallConnect allows students to collaborate with each other and their advisor, as well as access instructional resources, as they create the trailers. Other students can watch the book trailers on their smartphones by scanning QR (Quick Response) codes attached to books in the media center.

Another example is a middle school project in which math students created apps designed to help students review academic standards for state tests. Meanwhile, language arts students developed a plan for marketing the apps—with all collaboration done remotely. "This is exactly how the world works today," says Turpin. "Seventh-grade students are doing what corporate America, what Fortune 500 companies are doing."

### Transforming into a new world of teaching and learning

Hall County's blended learning model facilitates connections among teachers, enabling sharing and collaboration with colleagues down the hallway, across the district, or around the world. Through HallConnect, Hall County educators can access staff development materials to learn anytime, anywhere, and participate in the professional communities most interesting to them—creating the same ongoing culture of learning for teachers as for students.

Turpin today sees "a hum, a buzz of learning," with students working in cooperative groups; gathering and manipulating information to gain and create knowledge; and using high-order, inquiry-based methods to "discover the why, the how, not just the what."

Disciplinary referrals have dropped since personal devices, once forbidden, have become central to the learning environment. In addition to embracing a BYOD policy, Hall County supplies mobile devices, such as Dell Latitude™ E5430 laptops powered by Intel® Core™ i3, i5, or i7 processors, that are shared by students throughout a school. No longer required to power down, students in Hall County Schools are now learning and interacting in the same way both inside and outside the classroom. PS

## Learn more

Dell Learning Platform for K–12:
dell.com/k12/learningplatforms

# Deepening relevance and broadening reach in higher education

By Jon Phillips

The move to personalized and blended learning promises to revolutionize higher education and spur aspiring students to realize their dreams. Getting it right requires attention to some key IT fundamentals.

With many students seeking a nontraditional path to complete degrees, colleges and universities are finding innovative avenues for delivering individualized and blended learning experiences. Technology is helping schools extend their reach and boost the relevance of learning for each student, while fostering collaboration between educators and students across the globe.

Institutions have incorporated distance learning technologies to offer online classes, along with the ability to earn degrees online. Also, growing numbers of people are taking massive open online courses (MOOCs), which offer free Web-based classes to participants who typically do not expect to earn class credits. MOOCs create an opportunity for education CIOs and IT leaders to reexamine their institutions' positions on content, course delivery, and the total cost of an education.

To support students whether they are learning on campus or through MOOCs, colleges and universities are using technology that blends off- and on-campus instruction and interaction for an augmented, individual learning experience. In a personalized and blended learning scenario, an educator may reserve classroom time for interaction with students, and lectures may be delivered as Web-accessible online videos. For example, a professor could post a videotaped lecture that students can retrieve and watch at their own pace on their personal devices before class. The next day, the professor pulls together all students—both in person and online—for the interactive portion of the learning experience, including a live question-and-answer session and group work.

This infusion of technology into the learning environment allows students to use the digital tools that are already prevalent in their personal lives. Students increasingly expect to be able to access educational resources through their own devices, such as tablets, smartphones, and laptops.

## IT implications for higher education

To realize these possibilities, IT leaders in higher-education settings need an approach that integrates core education applications, digital learning resources, and actionable data. Several key IT factors must be considered when developing a learning stack that delivers a personalized and blended learning experience:

- **Data management:** Integration of data and metadata from disparate learning applications gives school leaders a comprehensive, report-driven view of educational efforts and enables them to develop meaningful predictive analytics. Timely access to unified educational data allows schools to personalize instruction and assist student counseling programs.
- **Interoperability:** Multiple learning tools and services together with single sign-on methodologies help ensure a seamless, easy-to-manage experience. The learning stack should include support for MOOC platforms.
- **Security and compliance:** Access to learning applications and data is controlled in data centers that support educational governance, security, and compliance requirements; these data centers can be on premises or in a cloud environment.

A major component of the learning stack is a digitized curriculum repository, which is largely built by the educators. Course materials might include educational videos and other digital learning objects, as well as lesson plans and assessment tools. Lecture-capture video recording equipment is essential for building the repository.

Because MOOCs provide open content, educational CIOs and IT leaders must focus on how content is developed and delivered within a community that believes information should be free. Moreover, MOOC platforms are not expressly intended to provide academic credit, so institutions must devise, test, and evaluate methods to award traditional academic credit for a student's successful performance in a MOOC.

## A potent mix

A personalized and blended educational model helps deliver learning services that are tailored to individual student needs. Best practices for developing a learning stack that incorporates MOOCs to maximize personalized learning experiences include the following:

- Determine how MOOC content that is made available through participating universities, organizations, and individuals will be reviewed for potential incorporation into existing higher-education course offerings and systems.
- Identify where the advantages of a new platform can be applied within the current educational ecosystem.
- Find out if the institution accepts MOOC completion documents for credit.
- Closely follow the development of external testing organizations, as well as existing institutional College-Level Examination Program (CLEP) test offerings.
- Be prepared to make necessary changes to existing e-learning instruction, and invest in any modifications necessary to remain competitive.

As educational technology leaders, Dell and Intel work together to deliver solutions that help colleges and universities establish their vision. Flexible, open, and standards-based technologies from Dell and Intel can be adapted into an integrated learning platform centered on each institution's requirements and existing educational applications and content. This platform must provide simple but secure access to underlying information and back-end core functions for professors, students, administrators, and IT personnel. In addition, the platform should present students with an easy-to-use interface that offers social learning opportunities and personalized content—sparking educational experiences that prepare them for the next step in their lives. PS

## Author

**Jon Phillips** is managing director of strategy and solutions for Dell Services Global Education. He has 20 years of experience as a strategy consultant serving primary (K–12), postsecondary, and higher education markets.

## Learn more

**Dell higher education insights:**
dell.com/hied/insights

**Dell higher education:**
dell.com/hied

# Predictive analytics: On track for a brighter tomorrow

Educators and administrators collect valuable information electronically but need an effective way to analyze it to enhance instruction and operational efficiency. Learn how predictive analytics enables two institutions to help students stay on track.

Enterprising K–12 school districts and institutions of higher learning across the United States are turning toward predictive analytics to help students flourish, particularly at-risk learners who may be struggling. Although educational institutions have developed outstanding ideas about how to tackle challenges such as performance, attendance, and graduation rates, few had the technology to harness, consolidate, and analyze available data—let alone a convenient, effective way to draw actionable insight from the data. That situation is changing with the availability of decision support systems based on predictive models to help drive successful teaching and learning outcomes.

Robust data management and predictive insight solutions from Dell and Intel are delivering results today, as seen by Dr. Jamie Wilson, superintendent of Denton Independent School District in Texas, and Dr. Vince Kellen, senior vice provost for Academic Planning, Analytics, and Technologies for the University of Kentucky. (For more information, see the sidebar, "Empowering successful student outcomes.") Join these leaders in discussion to discover how they are helping boost the effectiveness of what happens in the classroom. At the same time, they are working to deliver on the vision of a system that follows students from kindergarten through higher education and ensures nobody falls through the cracks.

"We can monitor student progress and respond to whatever developmental needs students may have, without delay. Now, not only can our teachers access data faster, they also can access data that is much richer than ever before."

—Dr. Jamie Wilson
Superintendent, Denton Independent School District
February 2013

### What driving forces led to a predictive analytics solution?

**Dr. Jamie Wilson:** Our main challenge was one that relates to many K–12 school districts: a lot of data, and an inability to turn it into something useful. In other words, we collected great information about student performance and attendance, but we lacked a way to consolidate it and get it to the right people at the right time. If we can spot trends quickly—or even predict them—then we can act on them quickly.

In addition to performance and attendance, a lot of variables help us understand how to help students succeed. Economics, family history, language spoken at home—all of these factors tell us important information. But we didn't have a way to consolidate, analyze, and act on that information.

**Dr. Vince Kellen:** At the university level, we have some of the same concerns. But when students fall off track in college, they're more likely to just drop out. Retention at this level is a complex issue, because it also involves things like family readiness, financial means, and student confusion about what fields they want to study and what careers they want to pursue. It's really important for us to understand these factors and how they help predict successful outcomes, because acquisition of students is far more costly than retention.

### How can clear insight into students lead to successful outcomes?

**Wilson:** Our goal is get our graduation rate up to 100 percent. To make that happen, we need the ability to spot early warning signs and place students in the right classroom situations. We don't want to wait for our students to fail. If our teachers know right away who's on track, who's off track, and how they need to adjust their approach, then they can make a difference. We've always had the data. It's just that nobody could ever get to it fast enough to make the biggest possible difference.

For example, in the past, if a teacher wanted to know how a student from a non-English-speaking home was performing on certain benchmarks, the teacher would request a report from our district's data and assessment coordinator. Compiling that data manually usually took between four and six days; meanwhile, the teacher would be waiting for that data to inform his or her instruction. By getting that data immediately, the teacher can quickly determine what's working and what's not working—while there's still time to take action.

**Kellen:** The situation is similar for us. We know that if we have some of those same abilities to spot early warning signs in performance, we'll be able to make the right changes to keep students on track. At the university level, though, we don't just want

"We want to provide students with personalized tips and reminders to help them succeed. Also, if we can provide faculty, staff, and administrators with student feedback, then those people are in a position to make better decisions. These kinds of insights are key to helping students graduate at a faster rate than they had been."

—Dr. Vince Kellen
Senior vice provost, University of Kentucky
February 2013

# Empowering successful student outcomes

Dell™ Education Data Management (EDM), developed in collaboration with Intel, is a predictive decision support system that enables educational institutions to develop actionable insights from data. With Dell EDM, institutions can track student information over multiple years and across multiple schools.

Denton Independent School District implemented a Dell EDM system that is based on Microsoft® SharePoint® collaboration and Microsoft SQL Server® database software. This data warehousing and predictive analytics system aggregates millions of performance data points on more than 25,000 students from disparate software systems to help the district improve student learning and increase retention. Teachers and administrators at each campus can view different dashboards that are customized with the information they need to see.

The University of Kentucky turned to Dell Services for help in deploying a Dell EDM system driven by SAP® HANA™ database software. SAP HANA provides a foundation for the university's student retention analytics model, which runs on Dell PowerEdge™ R910 servers powered by the Intel® Xeon® processor E7 family.

The high-speed, in-memory, real-time performance of SAP HANA enables the University of Kentucky to quickly analyze and predict the likelihood of student graduation. Proactive, timely feedback on student performance allows faculty and staff to intervene early with at-risk students and to help improve overall student engagement.

to gather data on students. We want to involve them in the process. For example, we want to provide students with feedback on their academic progress and give them some personalized tips and reminders to help them succeed. Also, if we can provide faculty, staff, and administrators with student feedback, then those people are in a position to make better decisions—adjust their styles, modify course content, design new programs, things like that. We feel these kinds of insights are key to helping students graduate at a faster rate than they had been.

### What about the budgetary impact?

**Wilson:** School funding from the state of Texas is based on student attendance. Not only are students with poor attendance at risk themselves, but they also bring down the level of resources that we have to help other students be successful. The budget for our school system is right at US$200 million, and it's based upon a weighted average daily attendance. So even if we increase our attendance by 1 percent—a very conservative goal—that represents US$2 million in additional funding.

**Kellen:** The budgetary impact, that's a good question. We did have to spend some money to get the project started. But we constructed our business model such that the project pays for itself. Down the road, we also hope that our education data management (EDM) solution contributes to improvements in student retention. That can translate into positive budget impact as more students choose to continue their education. Every 1 percent increase in retention can generate over US$1 million in yearly revenue.

### How has the picture changed since implementation?

**Wilson:** Our EDM system tracks each student's data between schools and over multiple years. We can monitor student progress and respond to whatever

developmental needs students may have, without delay. Now, not only can our teachers access data faster, they also can access data that is much richer than ever before. They don't have to rely on standardized test scores that come out just once a year. They can actually incorporate their own assessments. So we can do assessments every three weeks if we need to. That tells us in a much clearer way what's working and what's not so we can course-correct immediately.

We even have dashboards for each school campus and color-coded alerts next to each student's name. A yellow alert represents the predictive analytics working, and it tells us something's not right and that we need to dig deeper to fix it. Our teachers work as hard and as long as it takes to get the job done. And now, we're enabling them to work much smarter.

**Kellen:** We went live pretty recently, but we already have a lot of excitement around the project. We initially brought in a panel of students to give us feedback on early prototypes and concepts, so we feel that we've created something that's going to work well for everybody.

We're working on a mobile application that will give students information about themselves, their academic progress, and tips—sort of like a mobile academic health record. Students can also give us feedback to help ensure we're meeting their needs.

The second component is an advisor tool set, which gives advisors access to student information so they can better determine how to help individual students. It also provides them with automatic alerts when the analytics determine that individual students need help. What's already in place is a system that slices and dices student data to determine what we call a *K score*. The K score tells us how engaged a student is with us, and we're continuing to hone the system to make it more powerful and sophisticated.

We're also looking to the future with Dell, SAP, and some other partners to apply advanced analytics to the e-learning environment. If software can adjust to individual learners dynamically and personalize teaching, then we can help our distance-learning students be even more successful.

### How can collaboration through predictive analytics spur student success across K–20?

**Wilson:** It's difficult to have longitudinal systems when the systems don't communicate with each other. So that linkage must come first. But the possibilities are huge. We're collecting this data beginning when students are in third grade. And if we can track performance in higher education, then trace it back to performance in K–12, we can be more successful in identifying students who are at risk early. In other words, if we can understand why some students don't succeed at the university level, we can look back at their K–12 experience and see what happened there. We're beginning to build relationships with local universities to create models to make this idea a reality.

**Kellen:** In Kentucky, we have a longitudinal database that collects data for K–20, and that data is starting to be shared across the educational community in the state. It is critical to the future, because some problems seen in higher education may have manifested earlier downstream in K–12. By working together, we may be able to address these problems earlier, and then they won't exist by the time kids get to university. PS

## Learn more

Dell Education Data Management:
dell.com/edm

Dell SAP HANA solution:
qrs.ly/12322b7

# Empowering independence

By Kelli Hodges

Technology helps make learning accessible to students with special needs. It opens doors to education, employment, and more. The Dell Assistive Technology Service, developed in collaboration with Intel, encourages people to reach their full potential.

Assistive technology comes in many different forms. It encompasses anything that enables students with special needs to unlock individual learning potential and excel in education, life, and career. Assistive technology is any technology that empowers an individual in their daily lives, and the right assistive technology opens doors to achieving student outcomes. It also creates fresh opportunities for inclusive educational experiences, heightens independence, and sparks communication, collaboration, and self-expression.

Technology continues to change rapidly, and device innovations are enabling educators to unlock far-reaching opportunities for students to engage and interact in personalized learning environments. For example, students can enrich their individual learning experiences by using touch-enabled devices including Dell™ Latitude™ 10 tablets powered by Intel® Atom™ processors and running Windows 8 Pro.[1] (See the sidebar, "Abundant learning opportunities.") Assistive technology software for note taking, speech to text, video captioning, audio screen reading, braille display, and more enhance the learning experience for individuals with physical, vision, speech, hearing, and other special needs.

## Expediting evaluation and delivery

Expediency is essential when procuring, implementing, and supporting assistive technology, but the process can be complex and time-consuming. It requires concentrated research to match technologies with defined needs, the time necessary for integration, and a robust support system. The Dell Assistive Technology Service, developed in collaboration with Intel, provides customized assistive technology configuration, procurement, integration, and support services.

Access is promoted through the Dell Assistive Technology Configuration portal, developed in partnership with Electronic Vision Access Solutions (EVAS). It offers a single point of entry to access and procure assistive technology and is designed to align leading-edge hardware and software to the needs of individual learners. After selecting options through the portal, the Dell Assistive Technology Service automatically procures and installs items, checks the installation for successful operation, and delivers prestaged systems ready for use.

The portal's time-saving process is particularly important for organizations such as TERI, Inc. Based in Oceanside, California, TERI serves K–12 students and adults with autism, special developmental needs, and learning challenges. Technology is at the heart of personalized learning at TERI. Students use laptops, tablets, and even smartphones

[1] To learn more about touch-enabled Latitude 10 tablets and other devices, see "Boosting educational outcomes with an immersive learning experience," by David Fritz, in *Dell Power Solutions*, 2013 Issue *Personalize Learning* special edition, qrs.ly/f435hzd.

with assistive features to help learn social skills and express themselves. TERI and other organizations often do not have the resources to identify every single vendor and find the most suitable assistive technology for each student with special needs. As a result, the Dell Assistive Technology Configuration portal expedites procurement, freeing staff for projects focusing on the education of individual learners.

Achieving efficiency and personalization to optimize assistive technology for every individual with special needs can be challenging for service providers such as the Rocky Mountain Human Services (RMHS) rehabilitation center in Colorado Springs, Colorado. RMHS serves more than 6,000 individuals with special cognitive needs. It helps improve the lives of individuals by providing assistive devices such as communication boards that enable individuals incapable of speaking to communicate and build relationships.

Dell also works with institutions of higher learning to help simplify assistive technology procurements. The Michigan State University (MSU) Resource Center for Persons with Disabilities (RCPD) leverages configuration, prestaging, and deployment services through the Dell Assistive Technology Service. Dell works with specialists in the university's rehabilitation center to select, customize, and procure assistive technology for students who can purchase the turnkey solutions at the campus bookstore.

## Streamlining integration into existing IT framework

Integrating assistive technology can be as complex and time-consuming as configuration and procurement. Multiple boxes delivered to a location and the technology's installation and setup for the intended recipient can be challenging. In particular, many procurements for students with special needs occur outside the IT domain. As a result, integration complexities may arise for the IT team, caused by procurement from multiple vendors or configurations incompatible with existing infrastructure. For example, a college that needs to keep a computer lab running 24/7, such as MSU's RCPD, must be able to integrate assistive technology without taking the network down.

The Dell Assistive Technology Service enables seamless integration and implementation of an assistive technology. Dell experts install and configure the hardware and software, and then check the configuration to help ensure proper operation within the existing IT infrastructure. The goal is an out-of-box experience—end users unpack the technology, plug it in, and go.

## Benefiting from specialized support services

The Dell Assistive Technology Service offers support for assistive technology through a variety of services. A dedicated project manager can work with educators to procure and implement assistive technology and provide ongoing professional learning. Live chat, telephone, or e-mail support is available, and specialists provide product comparisons and preinstalled tools and resources that facilitate technical support, including restoring a device or technology to its original configuration.

This ongoing support is particularly important for RMHS, which often sends devices home with individual learners. If something goes wrong, a specialist can look at the RMHS-supplied device at its remote location and return it to optimum working condition.

## Brightening outcomes for all learners

Individuals with special needs are empowered to communicate and collaborate through assistive technology that promotes independence. The Dell Assistive Technology Service, developed in collaboration with Intel, enables comprehensive, customized configuration of assistive technology through a Web-based portal, with options for on-premises integration and support services. K–12 schools, institutions of higher learning, and rehabilitation agencies can deploy Dell-supported assistive technology to help transform the lives of individuals with special needs. PS

# Abundant learning opportunities

As part of the transformation to blended and personalized learning environments, schools at all levels are evaluating options for providing access to resources that help students with special needs make the most of their educational experiences. Mobility- and touch-optimized Dell Latitude 10 tablets powered by Intel Atom processors and running Windows 8 Pro offer a robust feature set. A USB port supports accessibility devices such as a head mouse, alternative keyboards, and optical character recognition (OCR) cameras. Instant on, picture password, live tiles, and advanced mobility features help students stay connected, access communication tools, and enhance their productivity.

Multitasking capabilities allow multiple applications to run simultaneously. Students can use a screen reader with text or magnify an object, and Windows 8 Pro runs legacy applications and emulates a Windows 7 experience—important considerations for individuals with special needs who depend on familiar tools. Students can also use accessibility options such as an onscreen keyboard, magnifier, speech recognition, and text in the Ease of Use Center available in Microsoft® Windows® operating systems.

## Author

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# Achieving district readiness for online assessments

By Michael Droe and Donna Boivin

K–12 districts are gearing up for online assessments, whether driven by Common Core Standards or state mandates. To effectively establish and sustain readiness, leaders must consider processes and people along with district policy and technology.

To support student learning and establish individualized benchmarks, online assessments are being designed to help teachers and administrators determine the necessary curriculum, technology, processes, and infrastructure. A key driver of online assessments is the Common Core State Standards (CCSS), which communicate expectations for proficiency in mathematics and English language arts at different grade levels. The U.S. Department of Education has awarded grants to several multistate consortia to develop these assessments, slated to begin administration in the 2014–2015 school year.

These consortia are releasing guidelines and minimum requirements to help schools establish infrastructure for online assessments that are aligned with the CCSS. The guidelines detail specifications for new and legacy equipment, as well as accommodations for students with special needs.

While all guidelines and specifications have not been finalized, districts in states adopting the CCSS should start preparing now to meet the defined timelines. Other districts may need to move to online testing as required by their own states. Common challenges districts face include ensuring adequate network capacity and capability for accessing the test environment, providing sufficient access to and security for the student assessment devices, and understanding which devices and peripherals meet testing requirements.

For example, some districts with noncentralized environments may have a mix of managed and unmanaged switches incorrectly connected throughout the network. Or in environments with different switch speeds, multiple network collisions or bottlenecks may occur—resulting in the test environment working fine in one classroom but not in another. With a need for consistency in test administration, such network variances have the potential to negatively impact testing performance.

To meet online assessment requirements, districts must plan to refresh policies, standardize classroom environments, and support a large increase of devices—all while optimizing total cost of ownership. For a successful transition to online assessments, seamless integration of technology, processes, and people is essential (see Figure 1).

## Building a sustainable environment

A smoothly running online assessment environment requires reliable tools and equipment, such as client access devices and peripherals; wired and wireless network access and distribution capabilities; security policy enforcement tools to help prevent cheating; and security, reporting, and asset discovery management tools to maintain the student assessment devices. For example, the desktop environment needs to meet the minimum operating specifications for online assessments, and the number and capacity of student assessment devices must meet a school's requirements. Furthermore, districts must address the assistive technology requirements of students with special needs.

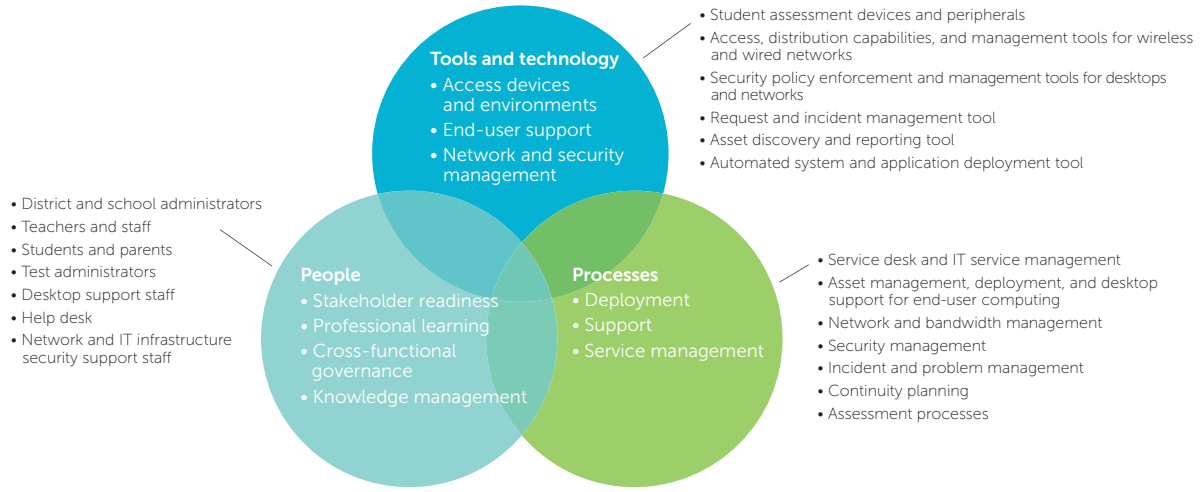


**Figure 1.** Essential components for establishing readiness

Understanding and preparing for the expected increase in network utilization and management is crucial to success. During testing, assessment traffic must be prioritized without affecting other essential organizational demands. Moreover, network and desktop security is essential to a testing environment, and districts must be prepared to implement security policies specific to online assessment activities. This includes the ability to lock down the system so students are unable to access other sites and tools during testing. Districts also must manage security exposures related to the Web browser and operating system. For effective remote monitoring and management of the assessment environment, IT can leverage security and manageability capabilities that are built into hardware, even when the computer is powered off or not functioning properly.

Processes such as device deployment, desktop support, and service management must be clearly defined and established. Organizations should develop and adopt best practices for deploying student assessment devices and for updating and patching them to prepare for assessments. An evaluation of service management practices includes looking at how incidents are reported and addressed with the goal of keeping the testing environment operational. Organizations should also create effective contingency plans for assessment environments that may be compromised by unexpected disturbances.

Equally important is the readiness of the people involved in the assessment and support processes, including those who manage assets and resources and help ensure that processes are repeatable and fit within institutional practices. Districts must determine whether adequate staff—for example, test administrators, help-desk personnel, network staff, desktop support staff, and security experts—is in place and receiving sufficient professional training. Besides launching and supporting the online assessments, they should also help sustain the environment as its impact on student learning expands.

## Getting ready

The Dell Common Core Readiness Assessment service is designed to identify a district's overall maturity to launch, support, and sustain an effective assessment environment, and to scale according to the enrollment of the organization. Assessment includes site visitations to physical buildings and an analysis of the logical core of the network, as well as evaluation of the actual testing environment with respect to capabilities and capacities. Dell performs a detailed gap analysis to identify needs and then presents a solution matrix that fills the gaps with preestablished, validated solutions.

Dell offers end-to-end, field-tested solutions that meet the specifications for online assessments as outlined by the Partnership for Assessment of Readiness for College and Careers and the Smarter Balanced Assessment Consortium, including a full range of laptops, desktops, and tablets powered by Intel® processors. Dell also helps ensure that districts have the necessary infrastructure components and support processes in place to keep operations running smoothly during testing, such as network and system management tools, security solutions, and deployment and support services.

In this way, districts can determine how to effectively promote online assessments not only as a measurement tool that complies with state mandates, but also as an instrument that helps guide instruction, boost student learning, and drive achievement. PS

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# Integrating equal network access for anywhere, anytime learning

An open, automated, and scalable distributed networking strategy helps meet reliability and security needs for curriculums designed to personalize learning with a mix of traditional classroom instruction, innovative technology, and online experience.

Mobile devices, digital content, online assessments, social collaboration, and the increasing use of virtualization and cloud computing are all part of an exciting, technology-enabled transformation in today's learning environments. The adoption of these technologies paves the way to accessible, student-centered learning. And it is key to meeting the demands of personalized learning curriculums as educators prepare today's digital-age students for college and careers. But first, school leaders must address networking requirements to ensure that a suitable network infrastructure is in place to support and scale personalized learning environments.

Traditionally, networks have been viewed as rigid *pipes* that move data from server to client, one point to another. An emerging approach to networking, however, is an intelligent, optimized, and application-aware fabric that adapts to dynamic workloads and automates management; data traffic travels from server to server, and may go from one point to many other points. This approach is part of a broad networking strategy that encompasses the following elements:

- **Open standards and interfaces:** By avoiding vendor and proprietary technology lock-in, open standards and interfaces enable organizations to augment network infrastructure, ease management, and allocate resources as a package across complex physical and virtual computing environments.
- **Automation:** Operational and IT staff efficiency can be enhanced by automating mission-critical processes such as the configuration of network switches and network monitoring.
- **Cost-effective scalability:** The capability to scale with a predictable financial model enables organizations to achieve the broad coverage, seamless operation, and easy management needed to facilitate growth.

## Network strategies to accelerate learning opportunities

While the era of digital learning has virtually unlimited potential to heighten educational relevance and creativity, school leaders need to address several IT challenges to help realize that potential. Advanced networking strategies are crucial in accomplishing that goal.

### Bandwidth demands

As end users turn to the network to perform increasingly data-intensive tasks, the thirst for bandwidth is rapidly becoming a significant issue for schools and educational institutions. This problem is compounded by the many forms of digital, multimedia content that is generated and the degree to which students

and other end users move around campus. If an institution's network does not have enough bandwidth to support the types of applications its end users wish to use, the entire network may grind to a halt.

To meet the rigors of bandwidth demands, networking strategies should incorporate comprehensive, end-to-end advances such as virtualization that embrace the cost-effective distribution of resources in a reduced footprint. Strategies should also enable flexibility in quality of service by allowing IT administrators to prioritize network traffic and manage traffic flow.

### Secure access

Considering that networks in schools and institutions of higher learning have a long history of being open, access is always a complex situation in educational environments. Providing secure access can be a significant challenge because many campuses are often running multiple operating systems on multiple servers, and each OS has its own distinctive security challenges. IT staff must ensure that end users who access the network are using approved security protocols and that data is kept private and safe. They also must make sure that as end users come onto the network from different locations, using different devices, each gets only the access that he or she has been assigned.

To help secure the access layer and manage access control, networking strategies should include an open standards–based, software-driven framework that facilitates IT efficiency and workload intelligence. Increased automation is at the heart of this framework, which IT administrators can leverage to automatically monitor and manage a variety of key network functions, including access control, in real time.

### Compliance requirements

A big influx of devices accessing the network also can engender compliance hurdles. School districts need to adhere to regulations such as the Children's Internet Protection Act (CIPA), which mandates that harmful Internet sites be restricted from students under the age of 18. They also need to comply with the Family Educational Rights and Privacy Act (FERPA), which helps protect students' personal data.

Higher education institutions face regulatory requirements as well, including the Health Insurance Portability and Accountability Act (HIPAA), which mandates the protection of personal, identifiable information. Educational institutions that are not in compliance with such regulations risk being fined and could face serious legal headaches. Advanced networking strategies help institutions comply with regulations through features such as the automatic provisioning of access rights, so that only specified end users are granted access to certain information.

### Growing complexity

Particularly for mobility, complexity is prompting comprehensive changes for many educational organizations. The growing demand for anytime, anywhere network access has expanded to include the use of personal mobile devices such as laptops, tablets, smartphones, e-readers, and more. And with more organizations espousing a bring-your-own-device (BYOD) philosophy, network administrators must be ready to support a slew of different devices. (See the sidebar, "Managing mobile device access.")

Automation helps IT staff tackle the problem of increased complexity. Administrators can preestablish policies for disparate devices with different operating systems, and enforce those policies in any number of ways. They also can securely provision additional devices and quickly identify and resolve problems as they arise. Through automation, helping ensure access to network resources or the use of antivirus and peer-to-peer applications becomes a process that can be maintained without much interaction by the end user or IT.

## Managing mobile device access

Many K–12 school districts, colleges, and universities have adopted or are considering bring-your-own-device (BYOD) programs. Well-planned BYOD implementations should automatically perform basic management and security processes such as the following:

- **Automated checks:** Performing checks automatically through persistent and dissolvable agents is important because administrative management is usually up to the student or end user in a BYOD environment. A dissolvable agent performs a specific, temporary process; it downloads automatically when an end user logs in, and removes all traces of itself when the process completes or the end user logs out.
- **Periodic inspections:** Routine inspections are critical to help ensure up-to-date antivirus, antispyware, and antimalware software.
- **Regular scans:** Device scans including USB storage, peer-to-peer applications, and services such as Skype™ and BitTorrent should be conducted regularly.
- **Control options:** Comprehensive management includes options for protected network access, manual and autoremediation through directed URLs, and other safeguards.

# Orchestrating network innovations

Because schools and campuses often require dynamic control of virtual servers, desktops, and applications, Dell offers an open networking framework to help maximize IT efficiency and workload intelligence. Dell™ Networking Solutions provides offerings designed to virtualize, automate, and orchestrate networking functions and services, addressing a wide range of traditional, virtual, and cloud environments with a comprehensive portfolio of wired and wireless networking solutions.

Feature-rich, cost-effective campus switching and wireless solutions as well as high-performance 10 Gigabit Ethernet (10GbE) and 40 Gigabit Ethernet (40GbE) networking fabrics in data centers can be tailored to fit specific campus networking needs. Comprehensive approaches help mobilize end users, desktops, and devices securely wherever they may be on the network to help meet fast-paced educational demands. Throughout the network, Dell adds easy-to-use management tools and a complement of professional services to help save time and simplify complex tasks cost-effectively.

### Funding limitations

Constrained budgets present a considerable challenge throughout K–12 education and beyond. Sometimes a lack of funding may put network upgrades on hold because of the impression that they are cost prohibitive.

One way many K–12 school districts upgrade a network cost-effectively is to leverage funds available through the federally sponsored E-Rate program, which provides discounts to help schools and libraries purchase telecommunications services, Internet access, and networking equipment. Funding opportunities are also available for higher education institutions. Private grants and contributions are among other preferred options for obtaining funding at the higher education level.

## Educational benefits of distributed networking

In addition to helping educational institutions overcome fundamental IT challenges, advanced distributed networking approaches yield the following benefits:

- Helping secure anywhere, anytime access enhances student and end-user productivity.
- Managing policies and end-user devices in an automated fashion provides consistent policy application across the network, freeing human resources for strategic tasks.
- Streamlining the network helps optimize operational efficiency and throughput for enhanced learning experiences.
- Utilizing advanced services, including scoping and training, helps reduce operating expenses.

Moreover, an innovative distributed networking strategy is designed to deliver additional benefits in the wireless realm. Managing devices with access points helps improve security, and taking the time to integrate devices at the outset typically translates into efficient management and reduced troubleshooting later. Embracing the 802.11n standard, for example, facilitates enhanced density and capacity, and it supports a fresh crop of multiradio, high-speed devices.

Open standards for distributed networking also provide academic institutions and organizations more flexibility than closed or proprietary environments. And the ability to scale easily with cost-effective switching elements enables organizations to pay as they grow instead of investing in unnecessary procurements up front. This promising approach to networking offers an evolutionary path that allows school leaders to build out educational infrastructures over time. (For information on the Dell approach to this networking paradigm, see the sidebar, "Orchestrating network innovations.")

## Expanded educational horizons

Many educational institutions have been operating within the confines of an inflexible networking framework. Now, dynamic, distributed networking capabilities enable data to flow to different points around the network. This flexible approach allows educators, administrators, and students to access the digital resources they need on demand.

This advanced approach to distributed networking helps streamline operations, increase efficiency, and reduce IT costs. It also enables educational institutions to scale their digital foundations flexibly and cost-effectively as the need arises, taking advantage of continuing technology innovations to enhance personalized learning outcomes. PS

*Permission to use the content and research for this article from the Dell-sponsored thought-leadership paper, "Facilitating anywhere, anytime learning," was granted by the Center for Digital Education (CDE), a national research and advisory institute specializing in K–12 and higher education technology trends, policy, and funding.*

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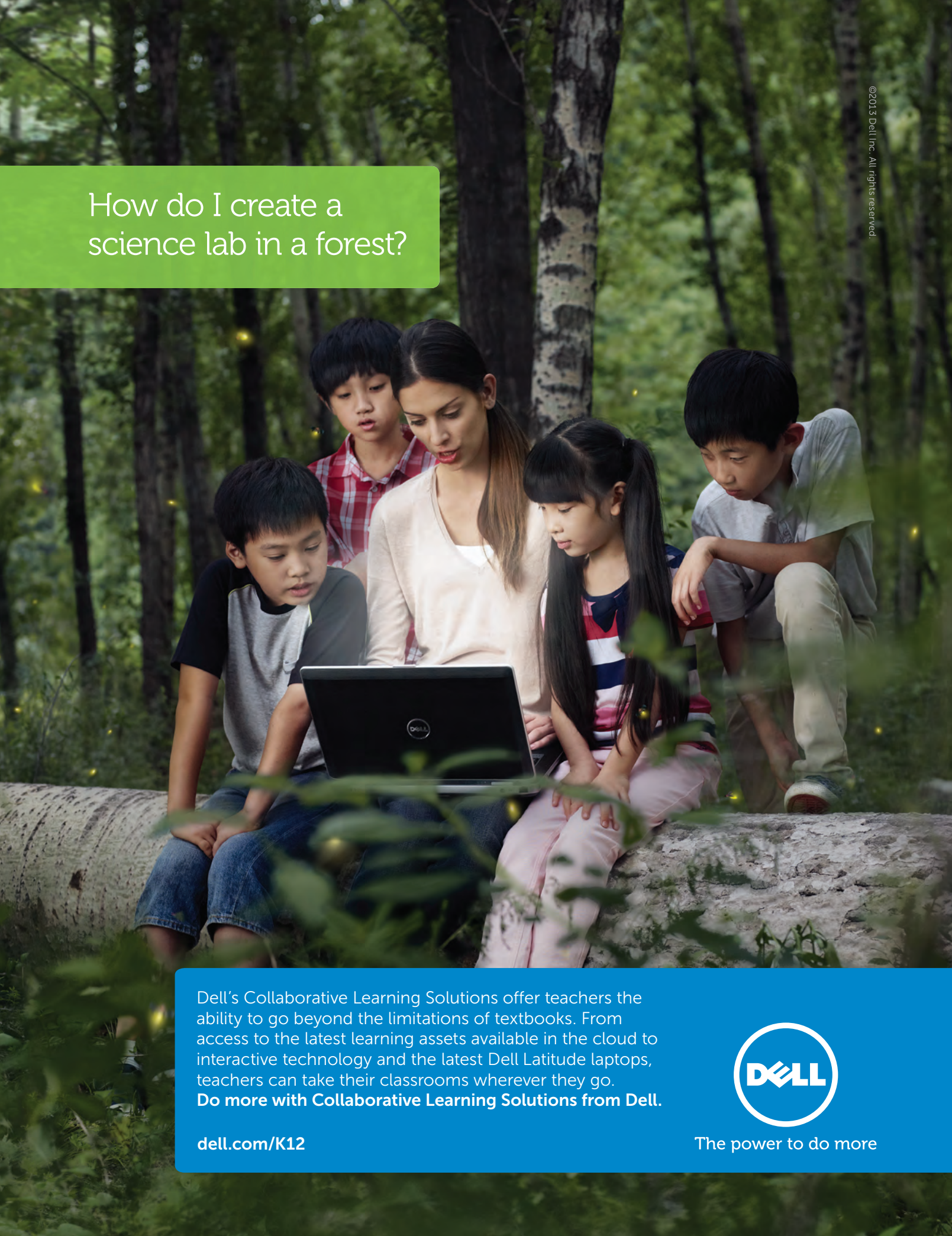
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