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Inside:

K-12 transformation
— at any size

Higher education goes
all-in on online learning

Making the case
for innovation in
assessments

**MICHAEL
HORN**

Author, *Disrupting
Class: How Disruptive
Innovation Will
Change the Way
the World Learns*

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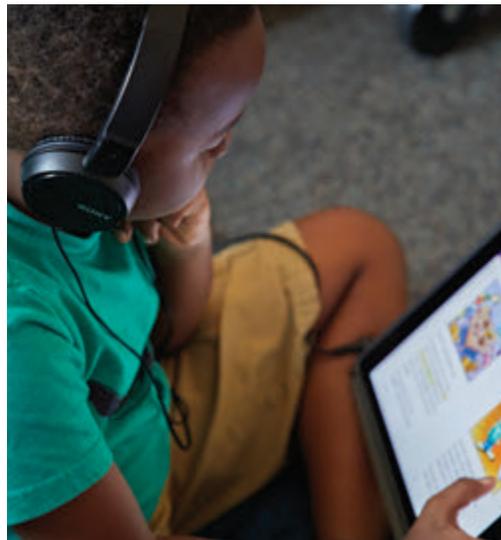
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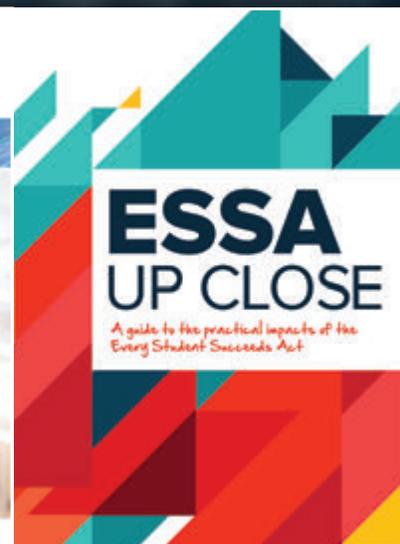
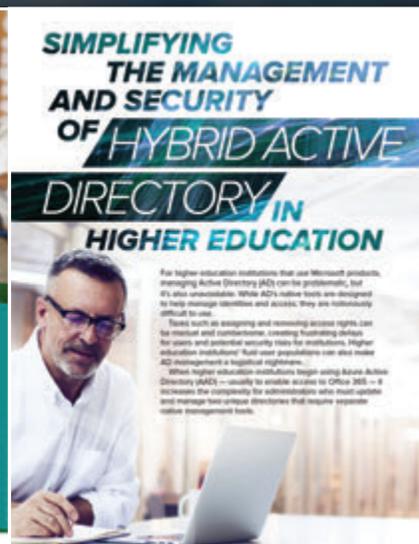
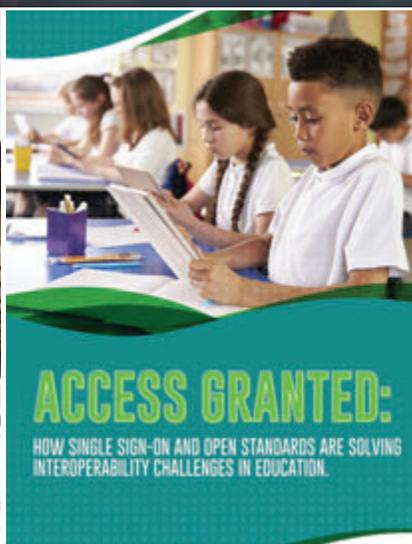


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The definition for disruption is “disturbance or problems that interrupt an event, activity or process.” Ever since *A Nation at Risk* was published in 1983, we’ve been trying to disrupt education. This issue of *Converge* explores a variety of disruptions from instructional disruptions such as blended learning to institutional disruptions like unique mergers and partnerships.

Although several models of disruption have been attempted in K-12, the greatest challenge consistently noted is scale. Our article, “*Disruption at Scale*,” looks at how three different-sized districts have successfully undergone digital transformation. Miami-Dade County Public Schools, Houston Independent School District and Pickerington Local School District in Ohio have each scaled their innovative programs. We share with you their journeys and the lessons they have learned along the way.

Our higher education community is also experiencing a call for disruption. In our winter issue we covered Purdue University’s merger with Kaplan to increase its offerings in online education. In this issue, we highlight other unique partnerships and mergers as higher education institutions compete to serve nontraditional students.

Finally, I had the chance to talk with my friend Michael Horn about where higher education is headed in the near- and long-term future. We’ll also post a podcast of our interview at www.convergemag.com.

I hope you enjoy this issue of *Converge* as much as we enjoyed putting it together for you. Perhaps some of the stories you see on these pages will be transferred to actions on your own campuses this spring!

CENTER FOR
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EDUCATION

The Center for Digital Education is a national research and advisory institute specializing in K-12 and higher education technology trends, policy and funding. The center provides education and industry leaders with decision support and actionable insight to help effectively incorporate new technologies.
www.centerdigitaled.com

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Michael Horn wrote the book on innovation in K-12 classrooms. Now he's making predictions about higher education.

A decade ago, Michael Horn shook the K-12 world awake with his book *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. He envisioned an education environment in which teachers' embrace of technology would radically transform the classroom.

In subsequent years, Horn promoted that vision, first as founder of the Clayton Christensen Institute for Disruptive Innovation — a nonprofit think tank — and more recently as a consultant to a host of organizations in the education technology space, including the Entangled Group, a venture studio focused on the education ecosystem.

Horn has broadened his horizons: These days he is looking beyond K-12 to consider the disruptive impact of technology in higher education. He's excited by what he sees, and optimistic that colleges and universities will soon take even bigger strides in the direction of digital learning.

In a wide-ranging conversation, Dr. Kecia Ray, executive director of the Center for Digital Education (CDE), spoke with Horn about the evolving digital landscape within higher education.

MR. DISR



UPTION

By Adam Stone

Are you seeing more higher education institutions interested in digital transformation?

Higher education is a more open and dynamic space than K-12. It is more of a 'market,' so you have institutions that need to innovate or face an existential crisis, which is quite different from K-12.

A lot of higher education institutions have created online programs in the last few decades. They are also launching competency-based learning programs and looking for other revenue sources. They are using those new programs as opportunities to innovate.

Where do you see the most room for growth?

The obvious choice is industries that struggle to find qualified employees who have the right skills after they graduate. There are huge opportunities in apprenticeships, particularly around digital skills. A lot of the shorter, faster boot camp programs represent areas where higher education institutions could have a big impact.

Where can higher education deliver value in the IT sector?

There is high demand around the digital augmentation of artificial intelligence and robotics, where you still need humans, but those humans need to sit alongside the technology and use it as an amplifier, not be replaced by it. That's where there are huge opportunities for higher education to innovate.

You've mentioned law schools in particular as ripe for change.

The legal landscape has changed dramatically in the last couple of decades, with disruptive innovations hollowing out the bottom end of the legal market. Legal Zoom can easily create a will or a basic contract. People don't need to get a lawyer for these things. There is also technology that has made lawyers more productive, such that



Horn at work in his home office. His forthcoming book looks at students' college-choosing experience.

DAVID KIDD

big law firms don't need to hire as many entry-level attorneys.

As a result, the number of lawyers graduating every year and the number of available jobs is terribly out of whack. Students are figuring that out, and fewer of them are going to law schools and paying expensive tuitions.

How can law schools reinvent?

Law schools can create new growth areas, whether that is non-JD programs that focus at the

intersection of intellectual property and legal questions, marketing and legal questions — things of that nature — or introduce low-cost, competency-based programs.

I think it is only a matter of time before a school launches a blended, competency-based legal program that dramatically lowers the cost of a legal education. They will focus it around how do you be a lawyer, and not just how do you think like a lawyer, which will be



“Colleges and universities are deluding themselves if they don’t think many of their students will be learning in an online or blended format in the future.”

Where do you see higher education heading next?

I think the next wave of innovation will be around mobile learning solutions. I am excited by Smartly, a mobile app that offers a free MBA. Smartly makes money by placing students into jobs — the employer pays them, not the student. The profile of the students using Smartly is astounding — they are equivalent to the GMAT score and the GPA of an MIT Sloan MBA student — and it’s a free program available on a mobile phone.

But how’s the pedagogy?

The learning design is amazing. It’s incredibly engaging, and is a very active experience — students respond to a question every six or seven seconds. Full disclosure, I am on their advisory board. I was so blown away by it and I think it’s just a matter of time before higher education institutions start to use some of these mobile platforms.

Duolingo, which is an app for learning languages, is another good example.

more effective. That will be a huge disruptive threat to those law schools that don’t start innovating now.

What example of digital transformation in higher education do you especially like?

I’m not sure there is any one model or tool. I have obviously been extraordinarily impressed with the work Western Governors University has done over the last 20 years. It serves 100,000 students online,

many of whom are training for nursing and teaching careers, as well as information technology.

I’ve been impressed with how they use faculty and technology in novel combinations to give students unbelievable support and allow them to move through full degree programs faster and cheaper. Oftentimes, those students are also simultaneously earning other credentials and certificates that are not a formal higher education degree.

With the rise of mobile learning, what happens to the residential character of higher education?

I am going to give you two split-personality answers.

On one hand, there are many universities and colleges that are deluding themselves if they don't think many of their students will be learning in an online or blended format in the future. Thirty percent of masters' degrees today are fully online. At least a third of students are taking one fully online course as part of their undergraduate experience. Just the growth of online students has been amazing. Even as there have been 12 straight semesters of declining higher education enrollment overall, online continues to creep up year over year.

But there's a flip side to this?

By the same token, my next book is called *Choosing College* — that's the working title — and we did our “jobs to be done” research, where we talked to several hundred students about their college-choosing experience.

The notion of “jobs to be done” is that people don't hire products or services for their own sake, nor do they conform to the average demographic of how they are supposed to act. They just find themselves in circumstances or situations, trying to make progress, and if you can understand what progress they are trying to make and what the circumstance really is and the constraints, then you can understand what the experiences are that they need to have to really get something done in their lives and make that progress.

And when it comes to choosing a college...?

As we dug into this, literally creating documentaries of how they chose college, what we found is that one of the jobs that people “hire” college to do is to help them have their ideal college experience. It folds back on itself. It is so ingrained in American society that for a certain percentage of us the American dream is synonymous with having that grassy green quad and prestigious campus. So, given the depth of passion and significance of

that “job,” my takeaway is that many students are going to continue to have a residential college experience and that colleges, several hundred or more, will continue to do just fine as largely residential campuses.

So there's a gap: Students want technology, convenience and remote access, but they also want the traditional college experience. Is there also an institutional disconnect?

Professors' incentives are often around research and breaking new ground. Sometimes that aligns very well with a certain subset of students and what they are interested in, but for a lot of students that is not what they are trying to get out of the experience, and there is a misalignment between those two groups.

What challenges does higher education face in addressing these gaps, especially in terms of digital readiness?

Creating short programs that are aligned to industry credentials and needs is complicated and difficult to



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accomplish with a faculty that may be removed from those industries.

There was a Dartmouth professor who left teaching for a year to work as an intern at Google and then returned to Dartmouth, which was enormously helpful for him. He realized that the theoretical constructs of the computer science major were incredibly helpful, but that a lot of the problems around big data and the specific applications of the course were out of date. Sitting inside of Google and looking at the actual problems they grapple with helped him revise his course.

Having those connections to industry is incredibly important. A lot of the practices at Western Governors University and Southern New Hampshire University have business panels informing the majors and the programs. I think that is an important step.

On the faculty side it can be more challenging. It depends on the university. There are some places that incentivize great teaching and the alignment of teaching to what students will need when they leave. Those

“For all the problems in policy and incentives, teachers and students together can still do some really cool things.”

places are set up for teachers to stay on top of the craft of teaching. But a lot of institutions focus on the research and not the use of technology in teaching.

What do you recommend?

One important step could be for institutions to step back and think through: What are the incentives and what is our purpose? Is tenure mostly about research or are there better ways to think about helping ensure student success after graduation?

That doesn't just mean a job. It could mean civic participation or something else. Be clear about the desired outcomes and decide how to best train and develop faculty members to work toward those.

What are you most excited about in 2018?

I am actually pretty optimistic about the personalization that is increasingly occurring in K-12 education. For example, Summit Learning has a free platform that any school can use for any subject in middle and high school with lots of content and deep projects.

I was skeptical that any district could take that off the shelf, but I went to four or five schools in the New England area last year, across the country from California where Summit is located. In 75 or 80 percent of those schools I was blown away with how teachers were implementing it, talking about what they were doing and the way the students were talking about it.

What was your takeaway?

It gave me a real sense of optimism. For all the problems in policy and

incentives, teachers and students together can still do some really cool things. They get the value of personalization — that is, to give students the right information at the right time, to keep them engaged and motivated, to make learning more efficient and more meaningful. Students get this and they understand the role of technology. There are other examples for sure in districts throughout the country.

Ten years ago, few people could have envisioned the rise of digital education as we've seen it. Looking ahead five years, what lies over the horizon?

It will be more honing of blending learning to move toward personalization and competency-based learning. I am not excited about blended learning for its own sake, but because it unlocks the ability to personalize at scale. It unlocks the possibility of mastery-based learning at scale.

As teachers start to blend or flip their classrooms, they will begin to ask questions. Why am I having students move on when they really don't understand or haven't mastered this foundational concept? Why am I making students do 50 problems on double-digit addition when they have clearly mastered this? Why am I not letting students apply these concepts in a more real-world context?

As they ask those questions, we will advance this field forward in some pretty exciting ways. 🌱

“I have been impressed with how (Western Governor's University) uses faculty and technology in novel combinations to give students unbelievable support.”



K-12 DISTRICTS TURN TO THE CLOUD FOR BACK-OFFICE MODERNIZATION

“WE NO LONGER WANTED TO BE IN THE BUSINESS OF OWNING AND MAINTAINING OUR OWN DATA CENTERS. WE WANT TO BE IN THE BUSINESS OF EDUCATING.”

Pam Willingham, Project Manager of ERP and SIS,
Volusia County Schools, Florida

Volusia County isn't alone. Increasingly, districts across the country — including Shelby County Schools in Memphis, Tennessee — are turning to cloud solutions to modernize their back-office processes. Cloud solutions can create tremendous efficiencies that free up time, money, infrastructure and other resources so districts can focus on providing a world-class education to students. Crucial to the success of these back-office transformations is the involvement of a trusted cloud implementation firm like CherryRoad Technologies Inc., an Oracle platinum-level consulting partner with more than 25 years of experience in modernizing, optimizing and managing complex back-office processes and technologies for school districts, higher education institutions, and state and local organizations.

VOLUSIA COUNTY SCHOOLS: REDUCING TCO AND IMPROVING BUSINESS PROCESSES

Volusia County Schools in Florida serves approximately 65,000 K-12 students. Over the years, it has run its legacy data center and back-office applications on premises, meaning it had to invest in and maintain the data center, upgrade it as needed, manage disaster recovery and more. When it came time to modernize the back office, the district considered, and then rejected, an on-premise solution. Technology had gotten in the way of servicing the users.

Instead, the district decided to move to a cloud-based Oracle solution, supported by CherryRoad, that provides a wide range of business capabilities while enabling unified visibility and control.

“Volusia carefully considered the total cost of ownership (TCO),” says Willingham, who oversees the district’s enterprise resource planning (ERP) and student information system (SIS) implementations. “We looked at a five-year model for TCO. The upfront cost of an implementation of this size, with world-class software like Oracle’s, is sizable, but it was important to do it right to position the district for the long run.”

The district found it could save money overall by transferring data center costs (e.g., personnel, maintenance, power, cooling, and rack and floor space) to the cloud vendor instead of operating infrastructure in house.

Another decisive factor was Oracle’s Platinum Partner CherryRoad and its implementation methodology.

“With CherryRoad’s methodology, we liked the idea that we would have a prototype early, that we would get our hands dirty early, and that the process would be iterative,” says Willingham. “The other reason we selected CherryRoad was due to its public sector experience.”

Using the solution, Volusia County Schools expects to:

- Secure data access so district leaders and staff can make informed decisions regardless of their location or device
- Support data-driven decision-making
- Implement employee self-service (e.g., to change contact information in benefits and payroll applications)
- Standardize purchasing and other business processes
- Eliminate duplicate data entry for purchase orders, payroll and other processes
- Obtain a single, consistent version of the truth
- Streamline workflows for grants, projects, budgets and other processes that have historically been paper-based

“CLOUD APPLICATIONS ALLOW K-12 ORGANIZATIONS TO BRING ACCOUNTABILITY AND MODERN ERP PRACTICES TO THE BACK OFFICE, LETTING SCHOOLS GET BACK TO THEIR CORE MISSION OF EDUCATION.”

Larry Hymson, Executive Vice President, Client Services, CherryRoad

NAVIGATING CHANGE THE EASY WAY

Back-office modernization can be a huge undertaking. Many school districts find the complexity and sheer scope of such a change requires the assistance of a consulting firm with demonstrated expertise. Both Volusia County Schools and Shelby County Schools chose CherryRoad to support them in their transformation after being impressed with its cloud-oriented methodology, processes and training; its full range of services; and its long-term support. CherryRoad has worked with numerous K-12 districts for more than 25 years and has been recognized as Oracle's Public Sector Innovation Partner of the Year.

Willingham with Volusia County Schools speaks to the value of working with CherryRoad: "We have 8,000 employees and are changing virtually every process in the district. CherryRoad's change management experts understand the complexity of the transition and the emotions associated with that. They have been great at educating change agents at every school."

By working with the right partner and using cloud-based solutions, districts of any size can catapult their back-office organizations into the 21st century and position themselves for the future. The following best practices will further set up districts for success:

- ✔ **Define business processes.** Knowing how and why departments do things will help a district identify opportunities for improvement and lay the groundwork for drafting an RFP.
- ✔ **Identify staffing needs early.** Determine needs for the project (business leads as well as technical leads), and identify their current responsibilities and how their roles will be filled while they are on the project.
- ✔ **Include business SMEs.** Identify subject matter experts (SMEs) in the departments where business processes occur and involve them in the project so they understand what they're getting and can champion the project with other faculty and staff.
- ✔ **Seek budgeting help.** Modernization requires a long-term financial plan. The Council of the Great City Schools (CGCS), the Government Finance Officers Association (GFOA) and other organizations can supply guidance on how to sustain projects over time.
- ✔ **Address data protection.** Be prepared to show how sensitive data will be protected and how the district will comply with government regulations related to financial information, health care records, student privacy and more.

SHELBY COUNTY SCHOOLS: ACCELERATING DEPLOYMENT, REDUCING RISK AND LAYING A FOUNDATION FOR THE FUTURE

Founded in 1867, Shelby County Schools in Tennessee has grown to serve 110,000 students in 49 schools. Four years ago, the district merged with Memphis City Schools, intensifying the need to modernize its legacy back-office system, which did not have the functionality or resources to support the larger, more complex district.

As the first step toward transformation, the district is working with CherryRoad to implement cloud-based financial and human capital management (HCM) applications running on an Oracle cloud infrastructure. The Oracle solution will allow the district to roll everything out incrementally, putting less demand on IT and minimizing disruption and risk.

Oracle's state-of-the-art infrastructure provides storage, processing, scaling, security and integration capabilities that the district would not be able to achieve on its own. Applications run faster, are more secure and seamlessly integrate. And the district can easily expand its solution set over time. Ultimately, the district's solution will incorporate transportation, procurement, contracting and other applications.

"The goal is to get as many of our business operations into that single system as possible. Doing so will turn us into a very efficient organization — with new capabilities and opportunities," says John Williams, CIO for the district.

Another important advantage of a cloud-based solution is that it will help the district address IT staffing challenges.

"It's difficult to keep the skill level that you need in the district, especially in an area that is competitive for workers. We can't offer the salaries that skilled staff can get in the private sector," says Williams.

With a cloud-based system, the vendor — not the IT team — handles updates and upgrades.

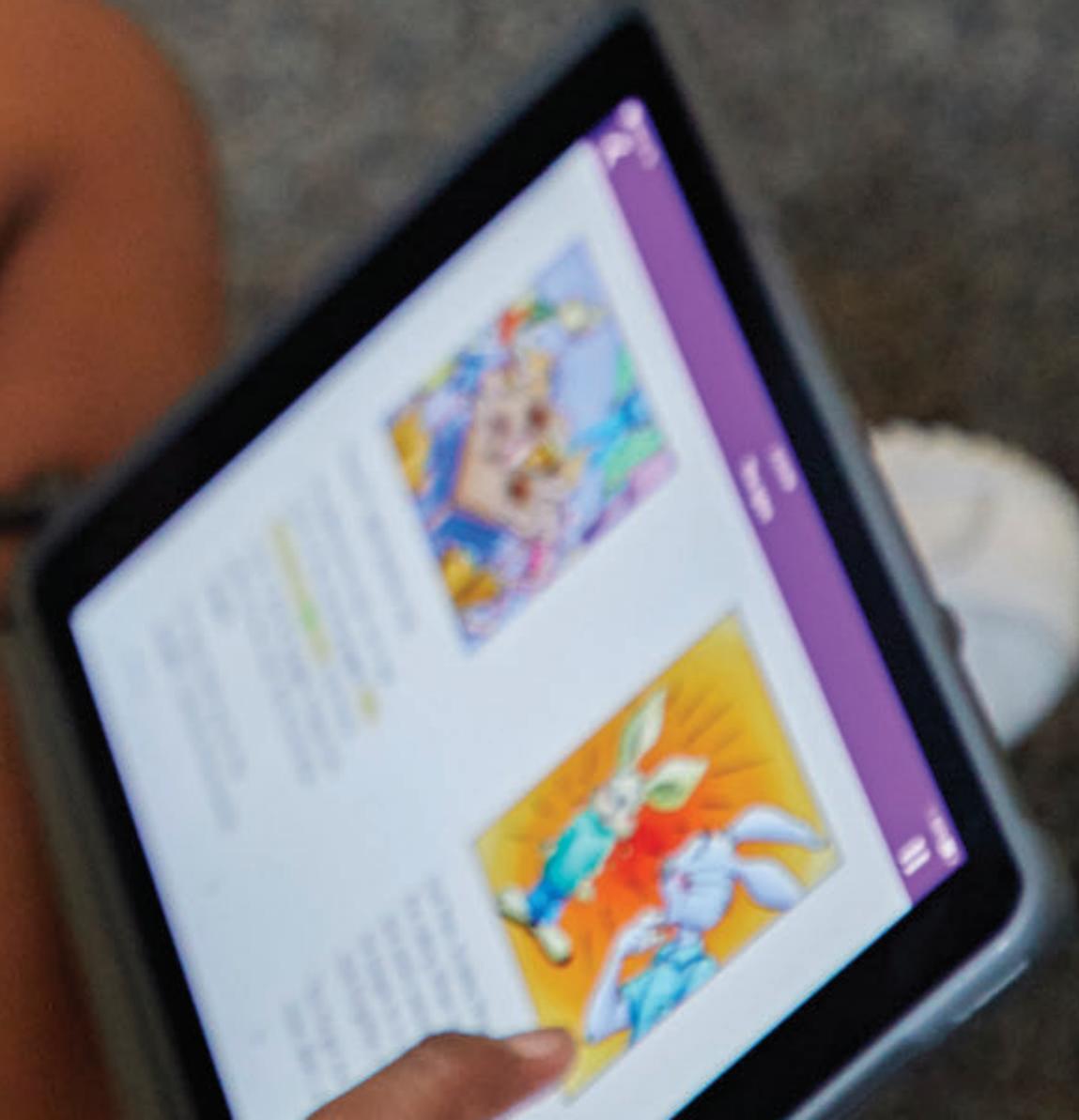
"Not having to deal with that at the school level takes a lot of pressure off the IT team," says Williams. "We have also been able to leverage our implementation partner CherryRoad's deep bench of experienced K-12 consultants to supply additional staffing resources as needed."

Lastly, a cloud-based system promotes consistency, security and productivity by ensuring every office in the district is working with the most current software and with constantly improved functionality.



Disruption at SCALE

K-12 districts large and small show that by taking risks, they can reap big rewards.



K-12 education is often seen as resistant to change. Whether that's a fair characterization or not, the history of school reform is littered with initiatives that began with great promise, only to wither on the vine. In districts of all sizes, even implementing programs and technology that have been successful elsewhere has often proven difficult.

But change — even disruptive change — is possible. The following three districts transformed teaching, learning and technology at scale — by putting tens of thousands of devices in the hands of students, by taking on the textbook industry and by creating an urgency for change. Their deliberate strategies to drive disruption offer lessons for districts and their leaders everywhere.

In Miami-Dade, 1-to-1 at Scale

Officials at Miami-Dade County Public Schools knew they wanted to move to 1-to-1 technology. But with 365,000 students — Miami-Dade is the fourth-largest public school system in the nation — doing so meant avoiding the pitfalls that plagued other large districts with similar initiatives.

“Superintendent Alberto Carvalho believed this program could be transformational for children,” says Marie Izquierdo, the district’s chief academic officer. “We agreed with him, but we were very deliberate in the way we proceeded, bearing in mind the lack of success of

others who had gone before us.”

By 2014, 100 percent of Miami-Dade’s schools had access to high-speed wireless internet — three years ahead of schedule. Today, the district has issued 154,000 devices to students at all grade levels. In school, students learn from more than 11,000 interactive whiteboards — installed in every classroom over the course of one summer. According to Izquierdo, the district has the largest Wi-Fi footprint in the country, covering more than 45 million square feet.

“It has been transformational in how teachers work and teach,” Izquierdo says. “It’s now ubiquitous.”

Among Miami-Dade’s strategies:

1 Focusing on the ends, not the means. Despite providing more than 150,000 devices to students over the past several years, Izquierdo says the devices were never the district’s key focus.

“One of the pitfalls some of our colleague districts that have attempted this at scale faced was focusing efforts around the device itself,” Izquierdo says.

Instead, Miami-Dade emphasized what she calls the “ABCs of digital convergence” — first identifying digital applications that fit the district’s instructional vision, then ensuring bandwidth and connectivity across the district’s nearly 400 schools. Only then, Izquierdo says, did the district focus on “d” — the actual devices.

Instead of deploying a single device across the entire district, Miami-Dade conducted focus groups and studies for different age groups, ultimately deciding to deploy carts with laptops for elementary students. The district provides middle and high school students with tablets to take home.

2 Leveraging multiple funding sources. The district announced its initiative after a confluence of events made paying for such a widescale investment in technology feasible. A \$1.2 billion bond initiative for school renovations approved by voters in 2012 included \$100 million for technology overhauls. Around the same time, the Florida legislature made it possible for districts to spend up to half of their textbook funds on digital materials and required students to take at least one online course, freeing up funding for digital applications. A district Race to the Top grant also allowed Miami-Dade to incorporate digital instruction into middle school math. The ongoing shift to digital assessments also incentivized the district to invest in student devices, prompting the district school board to take out a \$6 million loan to lease them from suppliers.



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MARIE IZQUIERDO

“We were very deliberate in the way we proceeded (with our digital convergence plan), bearing in mind the lack of success of others who had gone before us.”

— Marie Izquierdo,
Chief Academic Officer,
Miami-Dade County
Public Schools

3 Scaffolding rollouts. The first year the district focused on middle school math, deploying 10,000 devices across 49 middle schools. The following year, 50,000 devices were deployed. Along with the redesigned iPrep math program, the content focus began with civics in middle school and world history in high school.

“Social studies was the driver because that was where the strongest digital applications were at the time,” Izquierdo says.

Subsequent rollouts to additional subjects have followed as the digital applications to support them have matured.

4 Finding ways to close gaps. Whether they’re called “homework gaps” or “digital deserts,” most districts have students who don’t

have access to the internet at home. Through its participation in Sprint’s 1Million Project, every ninth-grade student who qualifies for free or reduced-price meals at school received a smartphone capable of serving as an internet hotspot. Additionally, the district issued 500 take-home laptops to the families of pre-K students whose parents attended three training sessions at school.

5 Engaging teachers. Miami-Dade also ensured its emphasis on useful applications, not just the technology that houses them, extended to teachers. Along with focusing on practical uses of the new whiteboards in each classroom, the district partnered with Facebook to implement a workplace-focused version of the social network. Teachers use the network, called M-DCPS Workplace, to communicate in real time, share resources and best practices, and even livestream lessons to other classrooms in the district.

Together, these strategies helped ensure not only the successful deployment of 1-to-1 technology, but also the emerging blended and personalized learning models that have made the investment worthwhile.

“It was a perfect storm, but in a good way,” Izquierdo says.

In Houston, a Line in the Sand

In 2013, Houston Independent School District (HISD) went to its textbook vendors and drew what Lenny Schad calls “a line in the sand.”

After implementing a district-wide learning management system (LMS), HISD made the decision to stop purchasing textbooks — itself a bold move, but one made more so by the limited availability of digital materials for all subjects and grade levels at the time.

“(We told our textbook vendors), ‘You need to send us your content digitally, but you also have to adopt interoperability standards,’” says Schad, the district’s chief information technology officer.

More specifically, the district wanted digital materials — not only the textbook content, but also related videos, links to materials on the internet and other resources — packaged in what’s called the Common Cartridge, a set of specifications built on top of a standards platform called Learning Tools Interoperability, or LTI.

Common standards were key to ensuring material and resources from different providers could be used interchangeably in the LMS and aligned with curriculum and standards. However, implementing them had not been attempted on such a large scale before. With a roadmap in place to provide every high school student in the district with a laptop, the timing was critical.



LENNY SCHAD

“(We told our textbook vendors), ‘You need to send us your content digitally, but you also have to adopt interoperability standards.’”

— Lenny Schad,
Chief Information
Technology Officer,
Houston Independent
School District

“If it was true digital transformation, it had to be more than giving kids a laptop,” Schad says. “It had to focus on providing real content digitally, and we needed a digital ecosystem to house that content.”

That imperative changed how HISD worked with publishers, according to Schad.

“It had to be in that format, or we weren’t going to purchase it,” Schad says. “There was some skepticism initially — [publishers] had been hearing for years that digital content was the wave of the future. It wasn’t until we sent out the letters saying this is the new normal for HISD that they really recognized [print] was not going to be an option.”

Among HISD’s strategies:

1 Leverage. It didn’t hurt that HISD is one of the largest districts in the country, and that because of its own size, the state of Texas has a significant influence on the K-12 textbook market. Other large districts joined HISD in demanding digital resources, and to publishers’ credit, Schad says, “they stepped up to the plate.”

The district played hardball at first with the largest content

providers that provided the bulk of its resources. Now that standards and expectations are in place, HISD requires other content providers to at least have interoperability in their roadmaps, even if digital resources aren’t immediately available.

2 Collaboration. For several years, HISD worked with large publishers and the developer of its LMS on refining the interoperability standards and ensuring they worked in practice.

“It was a very iterative process and very productive, with a lot of back and forth,” Schad says. “All these players were coming to the table, checking their egos at the door and really trying to come up with solutions that work.”

3 Change management. HISD’s strategy to implement digital textbooks and its LMS involved more than training and communication, Schad says. By focusing on the “why” of the initiative, he says HISD was able to “take into the account the emotional side of these big change initiatives.”

“When you talk about teachers changing the way they instruct, that’s very personal and emotional,”

“If it was true digital transformation, it had to be more than giving kids a laptop. It had to focus on providing real content digitally, and we needed a digital ecosystem to house that content.”

— Lenny Schad

he says. “When you talk about students not having textbooks, that’s very personal and emotional — even when they’ve grown up in a digital environment, they may not want the textbook pulled away.”

Cross-functional teams led the initiative. They were empowered by senior buy-in and supported — but not led — by the district’s technology staff.

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FACEBOOK.COM/HOUSTON INDEPENDENT SCHOOL DISTRICT



Data Security in the Cloud:

Myth vs. Reality

Four reasons why student and district information can be safer with a reputable public cloud provider than with an on-premises solution.

If you ask K-12 school district leaders what keeps them up at night, there's a good chance data security would rank high on their list — and with good reason. Verizon's 2017 Data Breach Investigations Report noted 455 cybersecurity incidents in education in 2016, with 73 confirmed data disclosures.¹

So how can school districts protect their data? Many districts find the answer to be cloud computing — the on-demand delivery of compute power, database storage, applications, and other IT resources through internet-based services. Although some K-12 leaders are apprehensive about moving data and applications to the cloud, this model offers numerous benefits, including security safeguards that district-operated facilities rarely can match. According to Gartner, “the security posture of major cloud providers is as good as or better than most enterprise data centers and security should no longer be considered a primary inhibitor to the adoption of public cloud services.”²

While education leaders are smart to be concerned about data security, their fears about moving to the cloud are often based on myth rather than reality. Information hosted in a district or school data center on a server that educators can see and touch may seem inherently safer, but that is not necessarily true.

This paper addresses some common myths about moving to the cloud, shares real-life examples of how the cloud helps securely support innovative learning models, and offers guidance on what to look for when selecting a cloud provider.

Let's consider some of the myths and realities surrounding cloud computing in education.

MYTH #1: Moving to the cloud puts our student and employee information at risk.

REALITY: Reputable public cloud providers build data center and network architectures to meet the requirements of the most security-sensitive organizations.

In a recent Center for Digital Education (CDE) survey of 215 education leaders, 60 percent of K-12 respondents said confidentiality of student information is one of their top concerns.³ What many educators don't realize is that data centers operated by public cloud providers offer added security when compared to district data centers using off-the-shelf hardware that can be compromised.

A cloud provider gives K-12 districts access to the same security tools used by some of the most advanced IT operations. Cloud providers are information security experts; their business models depend on protecting customer data. For example, with the Amazon Web Services (AWS) Cloud, robust security isolations are employed to keep data safe and accessible only to the right individuals. This includes physical data center security, separation of the network, isolation of server hardware, and isolation of storage. Built-in identity and access management tools permit employees to access information and services that are appropriate for their jobs,

and bar access in other cases. A security-conscious cloud service provider also offers tools that can detect common and emerging security vulnerabilities and address them automatically.

MYTH #2: Moving to the cloud increases our risk of data loss.

REALITY: A cloud provider can allow school districts to replicate data in multiple locations, providing business continuity that enables school districts to quickly and easily recover from disruptive incidents.

Earthquakes, floods, tornadoes, and other natural disasters can put data at risk when it's stored on premises. But the risks of storing data on premises don't always stem from a severe event, such as a natural disaster. Something as seemingly innocuous as a broken air conditioner can wreak havoc by overheating on-premises servers.

Because major cloud providers operate multiple, geographically dispersed data centers, they can offer greater durability and redundancy than what individual school districts can build into their own facilities. A cloud provider can also assist districts with disaster recovery and data resiliency. For instance, AWS provides infrastructure to store important data that is designed for durability of 99.999999999% of objects. Data is redundantly stored across multiple facilities and devices in each facility so it can be securely and cost-effectively recovered, even during large-scale disasters.

MYTH #3: Maintaining compliance with federal and state regulations will be harder in the public cloud.

REALITY: Many cloud providers offer built-in support that makes regulatory compliance easier in the cloud.

More than a quarter of K-12 CDE survey respondents reported auditing their data compliance management

A Safer Place for Student Data

Idaho Digital Learning (IDL) is a state-sponsored, online school that helps students throughout Idaho access flexible courses that accommodate their schedules and learning styles.

In 2013, an expired lease forced IDL to move student data from a state-of-the-art data center to a new location with fewer security measures.

"The new location didn't have a generator; it didn't have common access card credentials; and it didn't have PIN codes," says William Dembi, infrastructure specialist for IDL. "It was basically a server behind a locked door — that's it."

Security was an issue, and one of the key resources IDL wanted to protect was its home-grown student information system (SIS). After reviewing their options, school leaders eventually decided to migrate their entire on-premises infrastructure to the AWS Cloud, including their SIS. According to Dembi, the security benefits were immediate.

MORE SECURITY RESOURCES

With their SIS hosted in the cloud, Dembi says IDL leaders are much more confident in the security of their system and the data it stores — especially when it comes to FERPA compliance.

"Compliance is obviously extremely important to us. We don't want any sort of student information divulged," he says. The cloud's robust security measures — coupled with the confidence that they are complying with all privacy-related mandates — puts Dembi and his colleagues at ease about their data.

"It's an economy-of-scale thing," he says. "At IDL, our core competencies are providing great education and great experiences for students — not security. It just makes sense to have the people who focus on security and have more resources to handle that part of the puzzle while we handle making sure students get the best education. Now, we have our data with people who specialize in data security and who have the tools to protect it better than we can."



“Our biggest concern was making sure we keep our students’ data secure — and we’ve done that with our move to the AWS Cloud.”

- William Dembi, Infrastructure Specialist, IDL

BETTER REDUNDANCY

“Redundancy is also amazing in the cloud,” says Dembi. A couple of years ago a squirrel chewed through IDL’s fiber line, knocking out the on-premises internet over the weekend. But with their infrastructure now stored in AWS, students and staff weren’t affected.

“The benefit of the cloud was we didn’t even know anything happened until we came back on Monday. Students could still access their digital resources and digital learning because that data wasn’t stored on premises,” says Dembi.

Moving to AWS also simplified IT management. Dembi and his colleagues now have the time to be proactive, rather than reactive, when it comes to IT issues.

“Since moving to the cloud, we don’t have to worry about the physical security of our data stored in the cloud because it’s handled by AWS,” he says.

UNDERSTAND YOUR NEEDS

For education leaders who worry about moving to the cloud, Dembi says the most important thing is to take a step back and ask yourself what issues you are trying to address. Is it compliance, redundancy, protecting student data, or something else?

“Analyze the wants and needs you have with your infrastructure and processes, then see if the cloud matches up. In our experience, it matched up perfectly,” says Dembi. “Now our data is secure. We don’t have to worry about the physical security of it. We don’t have to worry about someone forgetting the firewall patch on our on-premises network. Our biggest concern was making sure we keep our students’ data secure — and we’ve done that with our move to the AWS Cloud.”

processes semi-annually or annually, and 46 percent do not know how often they conduct compliance audits. On the other hand, many major cloud providers conduct regular, independent security audits to aid compliance with multiple U.S. and international security regulations. Although districts retain ultimate responsibility for complying with security laws and regulations, many cloud providers offer tools and frameworks that help customers meet security standards. In fact, almost 40 percent of survey respondents said cloud technology had a positive effect on their compliance with federal requirements.

MYTH #4: Moving to the cloud is too complicated and difficult.

REALITY: Districts have a range of options for moving to the cloud. Migration can be approached incrementally or all at once. And expert help is always available if needed.

Most districts start by moving one core workload into the cloud, such as their website or learning management system. As they become more comfortable with the technology and begin to see the benefits of this shift, they progressively move more of their infrastructure to the cloud independently, or with support from external parties.

Once districts assess their needs to determine what they want to move to the cloud, they can proceed in the following ways:

- Use the district IT department to move workloads into the cloud.**
This option works best for districts with in-house expertise. It provides the most choice and flexibility to design and build solutions based on district needs. K-12 districts that choose this path should look for a cloud provider that offers upfront technical advice and support for migrations.
- Work with a consulting partner.**
For districts wanting expert guidance in their move to the cloud, this is a good option. A capable and certified consulting partner will understand and follow security protocols and best practices. They work closely with cloud service providers and can guide districts through the discovery, planning, migration, and operations stages.
- Leverage a SaaS provider.**
Software-as-a-Service (SaaS) is another path to the cloud, whereby the SaaS provider hosts software and applications for districts on its servers in the cloud. Districts pay for this service on a subscription basis without managing the backend technology associated with the applications.

A SECURE FOUNDATION FOR INNOVATION

Protecting student data is a fundamental requirement for companies that support K-12 education. That’s why Clever, a software service that makes it easier for schools to send student information to web and mobile-learning apps, chose to launch its service in the AWS Cloud in 2012.

Clever now serves 90 of the top 100 K-12 public school districts across the U.S., managing sensitive information including student names, contacts, and other personal data.

The AWS Cloud helps Clever protect student data, aid compliance with FERPA, and scale its services during peak usage times in the school year — all things that would be difficult if the company had to build and maintain its own IT infrastructure.

“These are the high-level challenges of building any system that talks across the internet,” says Alex Smolen, Clever’s lead security engineer. “All you need to do is look at tech news to see that even large companies fail to do this properly. So, for Clever it’s really core to our promise to districts to ensure that we follow industry best practices around security — that’s why we chose to work with AWS who can provide that expertise.”

HOW SAFE IS YOUR DATA RIGHT NOW?

Answering these questions can help you assess your district's security posture and show where gaps may exist.

✓ ARE DATA AUDITS ON YOUR RADAR?

- Do you know if your data has changed?
- Do you know who changed it, when, and from where?

✓ DO YOU KNOW WHERE YOUR DATA IS STORED?

- Is it secure?
- Can you simulate recovery from a total facility loss?

✓ ARE YOU ADDRESSING THE RISKS ASSOCIATED WITH DIGITAL CONTENT AND ONLINE TEACHING TOOLS?

- Can you confirm least privilege with third parties?
- Can you automatically rotate secrets for access credentials?

✓ DOES YOUR STAFF ACTIVELY TEST YOUR INFRASTRUCTURE FOR FAILURE?

- If you're encrypting your data, are you confirming your key material is backed up and you can recover from a total loss?
- In a total loss, how long can you afford to be offline? Can your staff accurately reproduce your current environment on an all new infrastructure?
- Have you tested your full recovery process and do you do so frequently or as staff changes?

✓ HAS YOUR STAFF BEEN PROPERLY TRAINED TO KEEP DATA SECURE?

- Are you auditing and responding in real time when policy is not followed?
- Do you have the expertise to deploy a data-loss prevention technology?

CONCLUSION

As threats ranging from hackers to natural disasters continue to endanger sensitive student information, data security and compliance remains a top concern in education. Moving to a public cloud provider can be an effective and easier-than-expected approach for school districts to access the security expertise they need without making major capital investments.

This Includes:

- Ongoing support from data security experts
- Improved data compliance with federal standards
- Increased data security
- Disaster protection
- Redundancy

Working with a reliable cloud provider that can deliver these benefits will help districts share the burden of data security with experts who can guide and support their efforts.



Amazon Web Services (AWS) Worldwide Public Sector helps government, education, and nonprofit customers deploy cloud services to reduce costs, drive efficiencies, and increase innovation across the globe. With AWS, you only pay for what you use, with no up-front physical infrastructure expenses or long-term commitments.

aws.amazon.com/education/K12-primary-ed/

ENDNOTES

1. <http://www.verizonenterprise.com/verizon-insights-lab/dbir/2017/>
2. <https://www.gartner.com/smarterwithgartner/is-the-cloud-secure/>
3. The Center for Digital Education surveyed 102 K-12 and 113 higher education leaders in early 2017. Unless otherwise indicated, all data is a result of this survey.

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“The core group understood why and how decisions were being made and worked to defend them,” Schad says.

As a result, the LMS and digital content represent a solid foundation on which to continue building, according to Schad. “Digital transformation is a journey,” he says. “We have laid those building blocks in the right order so we can continue to build on a foundation that is really solid.”

In Ohio, Starting from Scratch

Smaller districts face different — but equally challenging — issues when undergoing transformation. In Ohio, the 10,300-student Pickerington Local School District opted to start from scratch after assessing its existing technology.

When Brian Seymour became the district’s director of instructional technology in 2014 after starting as a teacher there more than a decade earlier, Pickerington students shared iPad carts and the district’s computer lab was consistently overbooked. Equally important, the district had no clear roadmap for technology use, which prompted Seymour to focus on building consensus around Pickerington’s technology needs and the purpose behind them.

“The first step I wanted to take was to create a rather robust technology plan that led us through the next few years,” he says.

Today, Pickerington is the largest district in Ohio to go fully 1-to-1 — from preschool through 12th grade. More importantly, it is shifting to a personalized learning focus as part of a four-year plan that goes beyond the technology that drives it. Seymour calls the approach “tradigital learning” — a combination of traditional teaching methodologies, new digital resources such as virtual reality technology and more relevant learning opportunities, including a planned K-12 computer science pathway and a high school IT pathway that provides an opportunity to earn an associate degree before graduating.

“We’re not there yet,” Seymour says, “but we’re well on our way.”

Among Pickerington’s strategies:

1 Focusing on the big picture. To develop a technology plan, the district created seven different committees to determine how it should use technology going forward. However, the discussion quickly broadened.

“What it ended up being was not so much just a look at our technology, but more of an examination of teaching and learning in general, and the ways in which we could use technology as a foot in the door to transform traditional education by using more modern-day strategies and techniques,” Seymour says.

That broader focus led to the decision to begin the preK-12 1-to-1 initiative, and the school board, which initially envisioned the rollout to be staggered over six years, ultimately provided funding to accelerate it to 14 months. The process also led to a second four-year plan focused on personalized learning.

2 Addressing the “why.” The initiative faced resistance from teachers, in particular those

concerned about classroom management and the appropriate use of technology, according to Seymour. But the bigger challenge, he says, was finding a reason for urgency. The district was academically successful in terms of its test scores and graduation rate, so Seymour and other district officials focused discussions around a different question — were they really preparing kids for the future?

“That became our focus,” Seymour says. “I think we need to look past the data we usually use to measure a school district. A great majority of that is content that students won’t ever use unless that content is specific to their job. We need to measure some of those other skills — the digital skills, the soft skills, the creativity, the communication, the collaboration-type skills that we’re getting from teaching and learning this way.”

Looking at technology in that way helped overcome resistance.

“We know technology has a huge impact on almost every single job that’s available out there,” Seymour says. “So if we train kids properly and give them the experiences they need in high school, they’re going to be far better prepared when they go into college or a career.” ◉



DAVID BALL, PUBLIC RELATIONS DIRECTOR, PICKERINGTON LOCAL SCHOOL DISTRICT



A Shifting LANDSCAPE

To hear some observers tell it, the future of higher education increasingly hinges on students who have never set foot on a college campus — and likely never will.

Serving nontraditional and working students was in large part the rationale for last year's acquisition of for-profit online provider Kaplan by Purdue University, which has been followed by additional consolidation and shifts throughout the higher education landscape.

In January, the 114-campus California Community Colleges system announced it would move forward with Gov. Jerry Brown's proposal to create a 115th, online-only campus. Eloy Ortiz Oakley, chancellor of the California Community Colleges system, noted the new school is largely targeted to adult learners who are already in the workforce, but find themselves stranded in an economy that values college credentials.

"Some college' is the new gateway to the workforce for this population," says Van Ton-Quinlivan, the system's vice chancellor of workforce and digital futures. "Given that, the question becomes, how do we meet them where they are?"

California's new online-only public institution represents the latest disruptive change in the ongoing series of mergers, consolidations and shifts in focus that have characterized the higher education sector in recent years. Consider the torrent of announcements over the past few months:

- For-profit providers Capella Education Co. and Strayer Education formally agreed to merge in January, with the deal expected to be finalized this fall under the name Strategic Education Inc.

- Grand Canyon University has applied a second time for permission to convert from for-profit to nonprofit status. At press time, its accreditor, the



APE

To be more competitive, higher education institutions are meeting students where they are. **By Mark Toner**

WIKIMEDIA

Higher Learning Commission, was also expected to rule on final approval of the Purdue-Kaplan venture.

- After its attempt to purchase now-defunct ITT Tech and convert it to a nonprofit faltered, the Dream Center Foundation acquired three for-profit college chains owned by the bankrupt Education Management Corp. (EDMC). The U.S. Department of Education, which had previously scuttled the nonprofit's attempt to acquire ITT Tech, gave its initial blessing to the \$60 million sale last fall.

- In January, the merger of Georgia Southern University and Armstrong State University became the latest in a series of consolidations within the University System of Georgia that

reduced the number of institutions from 35 to 26. Elsewhere, lawmakers continue to raise similar questions about public institutions and their governance structures — in recent months in Florida, New Mexico, Mississippi and Idaho.

Despite the roiling pace, the long-predicted sector-wide shakeout of institutions of all kinds has yet to fully materialize — although it may have begun. The 6,760 postsecondary institutions eligible for federal financial aid in 2016-17 represents a nearly 10 percent drop from the high-water mark in 2012-13, according to the U.S. Education Department's National Center for Education Statistics.

All institutions — public, private, two- and four-year alike — feel pressure

to offer different kinds of programs as expectations shift, says Trace Urdan, a managing director at Tyton Partners, an education advisory firm.

“Every institution except the super-elite is feeling this kind of pressure — to generate revenue, bring down costs, and be more responsive to working adult populations and provide opportunities that are less expensive,” he says.

While the goals of each new merger, consolidation and program have been described as highly specific to the context of the affected

institutions, a few common threads are emerging. Among them:

✓ **Serving (very) nontraditional students.**

Traditional four-year institutions have been mourning the stagnation of the high school graduate pool for at least half a decade, while the for-profit sector and community colleges experience boom and bust cycles with each economic shift. No wonder, then, that institutions of all kinds are now targeting students who aren't just far from their physical campuses, but unlikely to ever attend them.

"The structure of education and training is not well-suited for adults who have to work," says Ton-Quinlivan. "It's a population that even if our current colleges do well, no one is really thinking hard about how to reach them."

That concept was the driving factor behind the name ultimately selected for the new institution which will come out of the Purdue-Kaplan acquisition — Purdue University Global. In announcing the new name in January, Purdue President Mitch Daniels emphasized the online university's mission — "to bring postsecondary

credentials and even degrees to people who otherwise will never have a chance to achieve them and thereby help them get a leg up on life."

✓ **A focus on lifelong learning.** As they look to put their own imprimatur on the higher education landscape, both the Trump Administration and Republican lawmakers have emphasized apprenticeship and

short-term training programs, further intensifying the focus on adult learners — and providing adult skills to all learners.

"I would argue the skills gap is really a symptom of a larger problem — the gap between traditional education and workforce education," U.S. Secretary of Labor R. Alexander Acosta said during a conference in February. "Lifelong learning and lifelong earning should not be mutually exclusive."

That's a driving force behind the offerings proposed for California's online community college, which will focus on short-term credentials and certifications.

"Given how short the lifespan of skills are these days, people will need to come back [to postsecondary education] for booster shots throughout their career, and we need a flexible way to give that to them," Ton-Quinlivan says.

Traditional four-year institutions also are increasingly partnering with employers to provide professional development and continuing education offerings, such as Purdue's work with information technology giant Infosys and Arizona State University's EdPlus program, which includes customized workforce education offerings for employers

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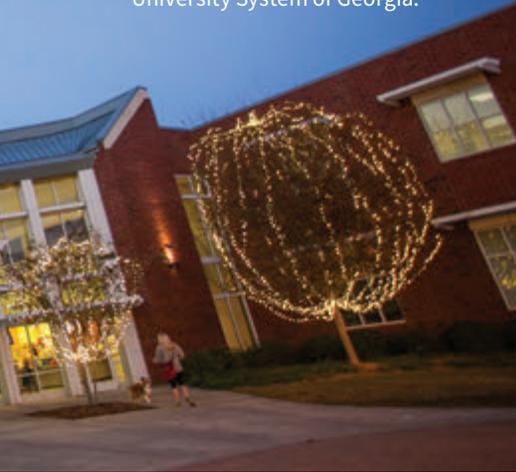
"I would argue the skills gap is really a symptom of a larger problem — the gap between traditional education and workforce education."

— U.S. Secretary of Labor R. Alexander Acosta



WIKIMEDIA

Georgia Southern University merged with Armstrong State University in January 2018 — the latest in a string of consolidations within the University System of Georgia.



such as Starbucks and Adidas. There's also growing recognition that degree programs need to incorporate the same kinds of career skills, if not credentials.

"We always told [traditional] students we're preparing them for their second job," says Center for Digital Education Senior Fellow Susan Metros. "There are students who graduate with BAs, MAs and PhDs who can't get a job because they don't code or have the entry-level skills so they can get in the door and work up to the more theoretical pieces. If you have two people and one has more technical skills, they're going to get the job."

✓ **New partners.** While every consolidation and acquisition to date has been different, each has focused on expanding competencies. For example, the Capella-Strayer merger — called "a merger of equals" by Strayer Executive Chairman Robert Silberman — is an example of bringing together complementary strengths: graduate and undergraduate programs, online and on-campus competencies.

Beyond acquisitions, institutions that have partnered with online program management (OPM) providers to develop new programs and offerings are now seeing those partners enter

new territory. 2U, for example, has focused extensively on expanding nondegree credential offerings by acquiring GetSmarter and more recently partnering with WeWork, a company that provides shared working spaces and uses them to offer coding bootcamp training programs.

✓ **New models.** With the emphasis on nontraditional students and lifelong skills, it's not surprising that institutions are focusing on competency-based learning and stackable credentials to give learners credit for past experiences. "Adults don't want to start from scratch," says Ton-Quinlivan. "They may have mastered some skillsets and want to move forward from that."

As models such as prior learning assessment and competency-based education are embraced, innovative institutions will play the role of what CDE's Metros calls an "educational competency consolidator." For example, Charter Oak State College, a public online college in Connecticut, already allows students to earn credit for prior experience, including testing, portfolios and military service.

Given the limited success rates of students — and particularly underserved students — in online programs, new models for support also are emerging. California Community Colleges is working with the Institute for the Future and community stakeholders to explore a variety of support options for its new online college, including adaptive and machine learning to inform automated responses to common issues, as well as individualized education plans and mentoring.

California lawmakers included an R&D component in the legislation authorizing the online-only community college, with a charge to ensure new technologies, infrastructure and pedagogies are brought back to the existing 114 colleges, where one-third of the system's 2.1 million students take at least some online courses.

✓ **The same mission?** Critics have been vocal about how the blurring of lines between profit and nonprofit, as well as the exotic models that are emerging, may impact the institutional mission.

An outspoken opponent of the Purdue-Kaplan acquisition and other for-profit players, The Century Foundation Senior Fellow Robert Shireman insists that public and nonprofit institutions must maintain existing financial requirements and oversight structures.

"The case that was made around disruption ignored a lot of things," Shireman says. "Either you eliminate conflicts of interest in the control of an institution or you don't. When for-profit companies are deciding whether a student has been adequately counseled or is academically eligible and making progress, and whether faculty are qualified, that's an invitation to make the wrong judgment call on all of those questions."

It also remains incumbent on institutions to provide community — even among so-called stranded students.

"Community is very important for the educational experience," Ton-Quinlivan says. But with the advent of social media and other new forms of communication, she adds, the concept has shifted in ways that complement online programs: "People are experiencing community in ways we would have discounted before."

In this and other aspects, the blending and blurring of programs offer opportunities as well as challenges. The institutions that focus on supporting students in emerging programs can "establish systems much more easily in the online space, and that has the potential to allow high-quality institutions to prove themselves and leapfrog ahead of others," Shireman says. That, he adds, "will help promote the discussion about who's being served, who is not and what is the best way to serve them." 🟢



It's Time for a New Era of Assessments

ESSA marks an opportunity for states to rethink how they evaluate student learning.

By Susan Gentz

For many people, innovation equals technology. It comes as no surprise, then, that changes in how we conduct assessments have largely focused on transitioning high-stakes testing to a digital format.

There's more work to be done, though, if we truly want to improve assessments and make a positive impact on learning.

Since the No Child Left Behind era, the predominate format for assessments has been high-stakes tests. These often act as more of an autopsy than an opportunity for intervention. Students take the assessment and then advance to the next grade with their gaps in knowledge unaddressed.

Instead, assessments should be a continuous loop of feedback that present opportunities for continuous improvement. The Every Student Succeeds Act (ESSA) encourages innovation in this area, allowing states to implement multiple types of assessments – including performance-based, competency-based, adaptive, summative and formative – and use them for federal accountability purposes. There is no reason a district couldn't use any combination of these assessments to meet students where they are in their learning.

While ESSA allows for these opportunities, many state plans submitted to the United States Department of Education don't take advantage of them.

However, there is one more opportunity for states that want to create innovative assessment models. A pilot program, "The Innovative Accountability and Assessment

Hampshire Performance Assessment of Competency Education (PACE) program. While it is important to note that New Hampshire is small in population – and larger states will have different challenges – it does not diminish the incredible work being done in the state.

The United States Department of Education recently released the

High-stakes tests often act as more of an autopsy than an opportunity for intervention. It's time to be more innovative with our assessment models.

Demonstration Authority," was created so states ready to take innovative assessments live statewide would have the opportunity to do so. The pilot does have limitations – only seven states (or consortium of seven states) will be approved for the first round of participants.

The Innovative Assessment Pilot is modeled after the statewide New

application for states interested in participating in this pilot. The deadline for transmittal of applications is April 2, 2018. Experts say that we shouldn't be surprised if only a few states get approved on the first round, but at the very least, this pilot can help begin conversations to create student-centered learning environments and use assessments to spur learning. 



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DOCUMENTING

Change is happening in K-12 and higher education institutions — and the Center for Digital Education is keeping an eye on their progress. Here are some of the top disruptions happening throughout the country.

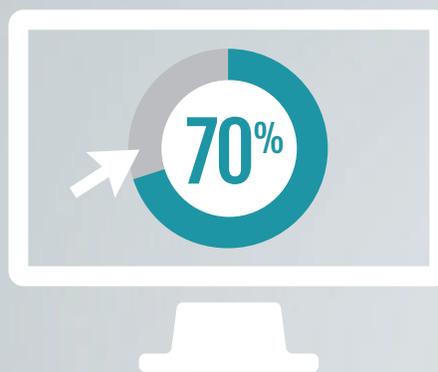
K-12



PERSONALIZED LEARNING GOES MAINSTREAM.

66% of K-12 districts are implementing personalized learning.

ONLINE TESTING TAKES OFF.



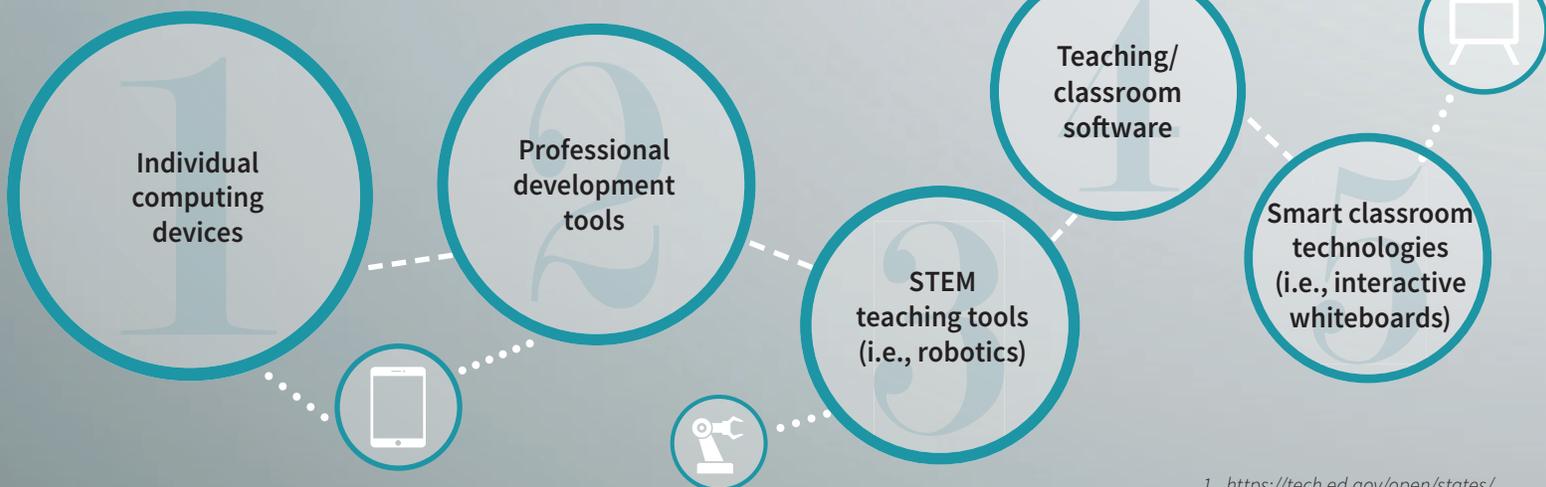
70% of K-12 districts say they have the infrastructure in place to conduct district-wide student assessments online.



DIGITAL CONTENT DIVERSIFIES.

40% of states have committed to #GoOpen with the U.S. Department of Education, and use openly licensed educational content within their schools.¹

TOP 5 PLANNED TECHNOLOGY PURCHASES



1. <https://tech.ed.gov/open/states/>

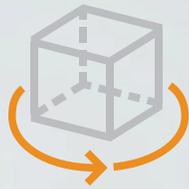
DISRUPTIONS

HIGHER EDUCATION

PHYSICAL ATTENDANCE OPTIONAL?



of higher education institutions are increasing online classes.



HIGHER ED GOES HIGH-TECH.

22% of higher education institutions plan to procure simulation labs within the next 1 to 2 years.

EDUCATION GETS SMARTER.



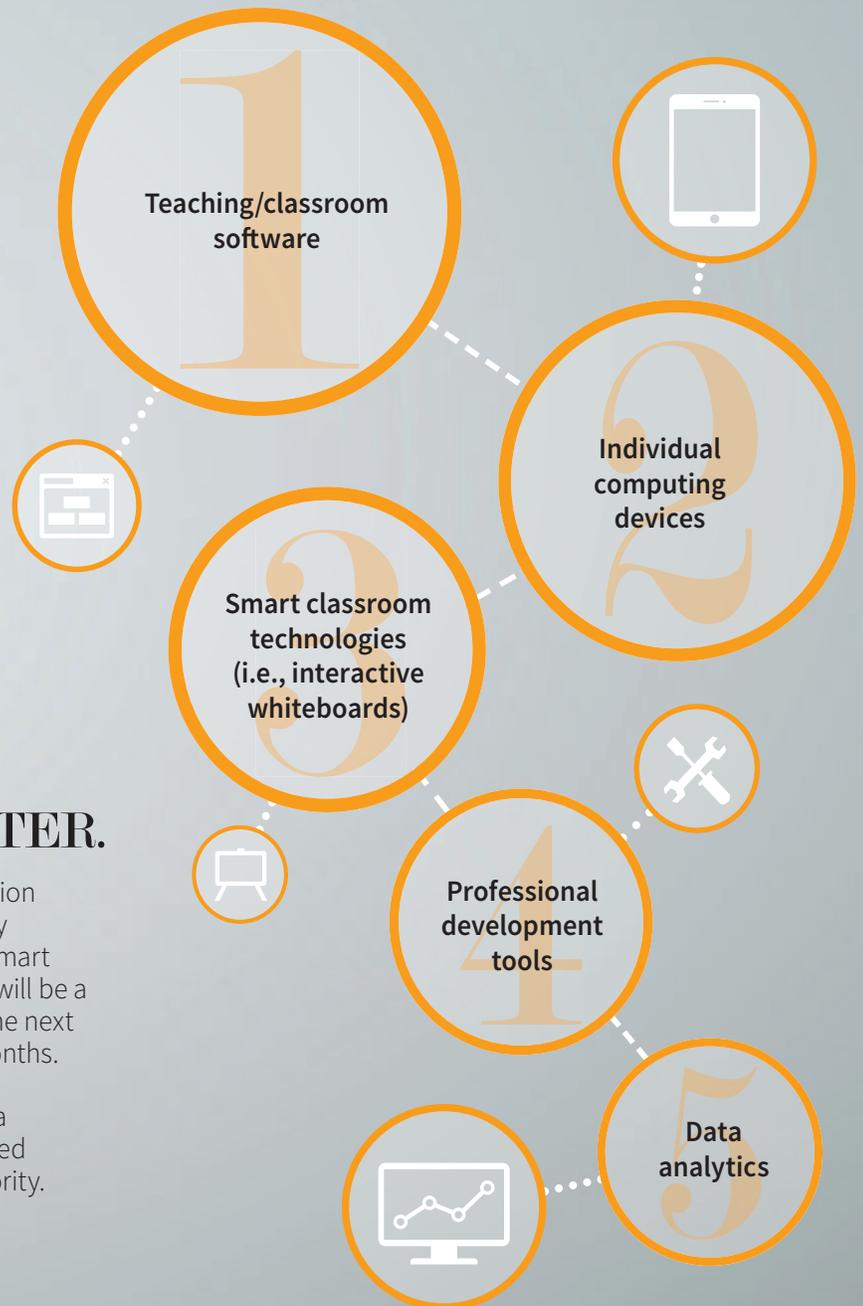
13%

of higher education institutions say investing in smart classrooms will be a priority in the next 12 to 18 months.

8%

say moving to a smart/connected campus is a priority.

TOP 5 PLANNED TECHNOLOGY PURCHASES





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