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CLASSROOM MANAGEMENT

A RESEARCH REPORT FROM
THE CENTER FOR DIGITAL EDUCATION

Strategies and
technologies to
improve teaching
and learning

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THE CENTER FOR DIGITAL EDUCATION SPECIAL REPORT is a one-of-a-kind publication that provides education leaders with research-rich content that includes perspectives from industry experts and public sector peers. It consolidates current thinking, best practices, tips for successful implementation, professional development guidance and more — all within a single source. We hope you enjoy this current Special Report on Classroom Management. Don't miss the next Special Report on Building the Curriculum of the Future coming out this winter! www.centerdigitaled.com/reports



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INTRODUCING FUTURESTRUCTURE: A NEW WAY TO SOLVE OLD PROBLEMS

It's a common problem in education institutions: the infamous silo. Siloed departments. Siloed people. Siloed data. Siloed policies. There have been many plans for progress that have failed simply because of a myopic focus on solving the problems of one department or one institution that did not take into account the fact that no institution or department is an island and that everything is connected.

Our new initiative, FutureStructure, is an attempt to change that. The goal of FutureStructure is to help public sector leaders, including those in education, who are working to effect positive change in a world where everything is increasingly connected and complex. FutureStructure provides a new framework to help leaders think about their institutions as systems within a community — and understand that policies, programs and progress have an effect on and are affected by other organizations and systems such as economic development, housing, transportation, law enforcement, parole, youth and community development, health and human services, and, in the case of higher education, K-12 itself.

In education, FutureStructure recognizes three over-arching assets and proposes that we look at how these assets can work together:

➤ Hard Infrastructure

Hard infrastructure includes school and campus buildings, classrooms, lecture halls, cafeterias, residence halls, libraries and even students' homes. Also included are school buses,

campus green space, public transportation, school playgrounds and other capital assets.

➤ Soft Infrastructure

Soft infrastructure comprises our policies, people and programs. Human capital, including staff, teachers, adjunct faculty and professors, all fall under the umbrella of soft infrastructure. It also includes community influences such as businesses and families. New standards for teaching and assessment progress; emerging issues such as certifications, branding and badging; and concepts like blended learning, flipped classrooms, personalized learning and MOOCs are soft infrastructure. Curriculum, grading policies and structures, professional development and leadership, and funding, including grants, are soft infrastructure as well.

➤ Technology Infrastructure

Technology infrastructure includes mobile devices, applications and social media, as well as broadband infrastructure and community wireless initiatives. Desktop virtualization, cloud computing and other platforms; as well as classroom management solutions, learning collaboration tools and dashboards are also technology infrastructure. Interactive whiteboards, lecture capture, student response systems, student management systems and longitudinal data systems all fall into this category. ■

**FutureStructure
aims to overcome
silos and solve
the problems
associated
with them.**

FUTURESTRUCTURE AND CLASSROOM MANAGEMENT

Classroom management is a perfect example of why a framework like FutureStructure is necessary for education to successfully move forward. Ask anyone the definition of classroom management and you are likely to get various disparate answers, with one common denominator: Classroom

management is the responsibility of the instructor. This is the conventional wisdom.

While educators are an integral and important part of classroom management, they are also one part of an interconnected system that includes many moving parts, each of which has an important role.



Classroom Management

Below are some of the hard infrastructure, soft infrastructure and technology components that comprise effective 21st-century classroom management:

➤ Hard

Residence halls, lecture halls, classrooms and campus green space provide structure for teaching and learning.

Thoughtfully designed desks and workspaces complement personalized learning.

Buses and public transportation, especially those outfitted with Wi-Fi, can provide another place for students to continue learning.



➤ Soft

Planning, collaboration and communication position campuses for success regardless of the size, scale or type of technology implementation.

Professional development strategies better prepare faculty to master classroom management techniques and incorporate new technologies and pedagogies as learning models evolve.

Blended, online and flipped classroom models encourage personalized and differentiated learning.

Security and privacy guidelines, mandates and laws protect students' personal information and help ensure they are accessing appropriate educational content.

➤ Technology

Apps and Web tools engage students through content consumption and creation.

Monitoring software helps teachers ensure students are on track.

Single sign-on simplifies technology use in the classroom.

Learning management systems organize digital information and help students collaborate with other students and faculty.

Devices like tablets, laptops and smartphones help students access and create digital content and assessment tools while student response systems help educators make sure students are on track.



Systems Thinking in Education

In addition to the hard, soft and technology components, FutureStructure also advocates for taking a systems approach to solving problems and implementing solutions. What does this mean in education, particularly when it comes to improving teaching and learning? Taking a systems approach and looking at an education institution as a system composed of interconnected systems — the hard, soft and technological components we listed previously — helps leaders see the potential impact of the decisions, both large and small, they make every day. It helps them to not be bogged down by a narrow set of problems, or only focus

on a limited set of solutions. It helps leaders to see the big picture and realize that while successful projects and implementations are important, they must be carried out as part of a larger vision. Taking a systems approach means considering all aspects of the system in decision-making and consulting impacted stakeholders in planning.

Throughout this report, you will see “FutureStructure Insights.” These insights are specific examples or words of advice that show how FutureStructure applies to education, specifically teaching, learning and classroom management. ■



**FutureStructure
Insight:**



Systems Thinking in Education

Below are responses from education leaders who participated in the CDE research survey for this report — their answers illustrate the need for systems thinking in education.

“ IT is setting up new governance structures but there’s little difference between how simple decisions are made and complex ones. Thus, all solutions take a long time and implementation and training often get put on the back burner.”

“ Departments are siloed, and even within departments, faculty and staff do not communicate with one another effectively.”

“ IT and other high-level groups often say, ‘This is what we are going to do,’ instead of asking what will truly work.”

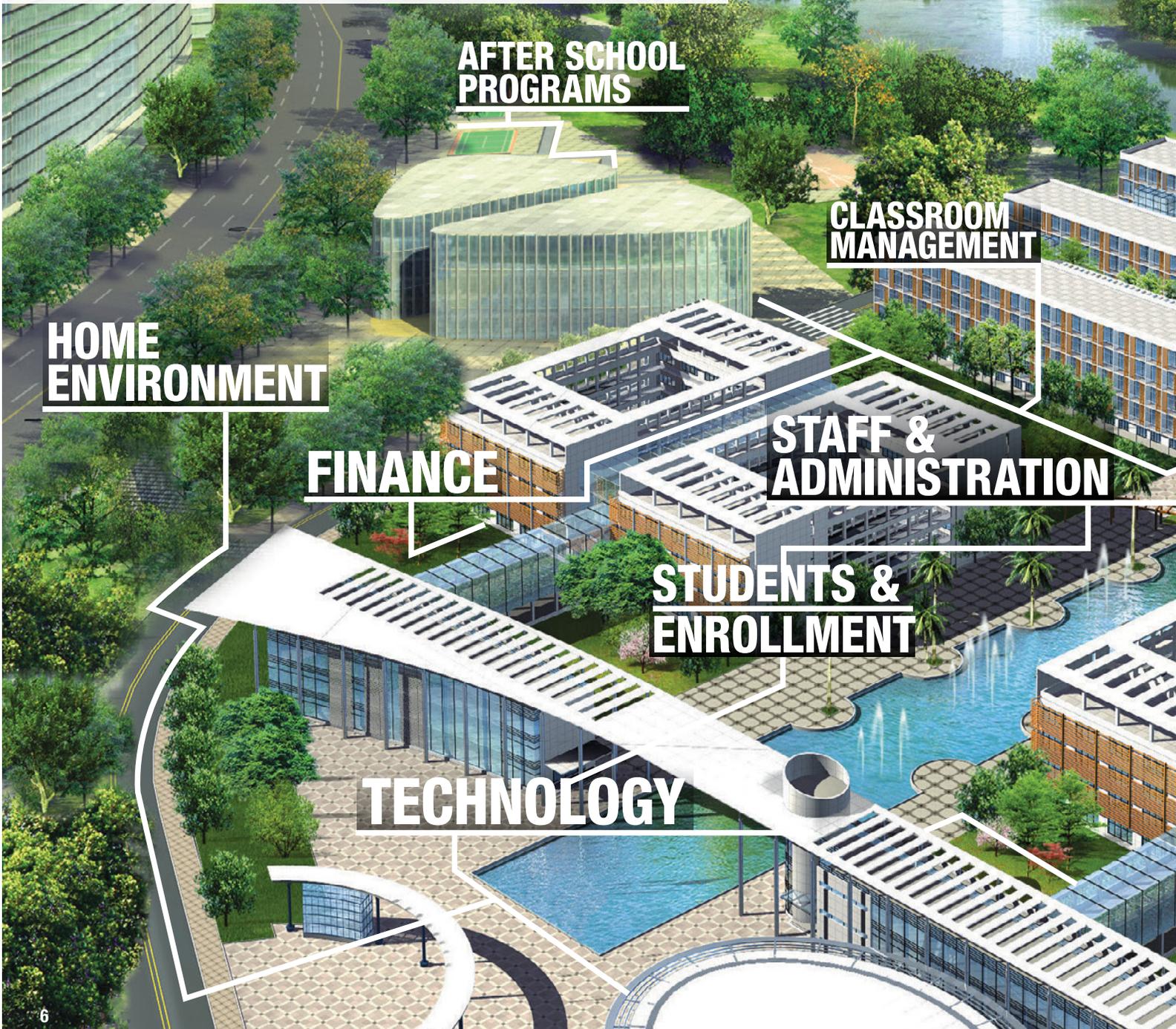
“ Administrators have assigned most tech-related tasks to ‘techie’ who have no concept of how instructors and students will be using what is decided upon.”

“ A multi-campus system has distinct needs on each campus. We do need more coordination and better communication among the campuses.”

Source: CDE Research Survey on Classroom Management, 2014

EDUCATION AS A SYSTEM

Like most government entities, education often suffers from keeping its students, staff, departments, policies and technologies in silos. Our new initiative, FutureStructure, is an attempt to change that. Decisions made at the campus, district, university and community level can, and do, affect each other. This graphic illustrates that everything and everyone in the education system is connected. While the focus of this Special Report is classroom management, we've included sidebars and case studies throughout that help to illustrate how classroom management fits into the overall education system.



GOVERNMENTAL ORGANIZATIONS

FEDERAL & STATE POLICIES

OTHER EDUCATIONAL INSTITUTIONS

FUNDING

NUTRITION

PROFESSIONAL DEVELOPMENT

CURRICULUM & PEDAGOGY

SCHOOL BOARD

CAMPUS BUILDINGS

FLEET MANAGEMENT

NETWORK INFRASTRUCTURE

CLASSROOM MANAGEMENT IN THE MIDST OF A TECHNOLOGY TSUNAMI

The last decade has been a whirlwind of evolving technologies, innovative initiatives and first-of-their kind implementations.

It's fair to say that no matter the size or location of your institution, you have been touched and transformed by technology in some way.

As we grow more familiar with these technologies and prepare ourselves for their inevitable successors, it's time to hone in on how to manage them effectively and ensure they help inspire and engage students of all ages. We must also limit botched rollouts and underutilized investments and use lessons learned from the past to smoothly integrate the best digital tools to complement curriculum. We need to ensure technology is used by students to create a higher level of personalized learning that helps each student reach his or her potential.

It's a tall order, and, if there's one thing the Center for Digital Education (CDE) hears repeatedly, it's that technology is never the biggest hurdle. It is change management — including professional development — and effective planning, as well as all of the considerations that have to be made before embarking on an initiative. It is the ability for teachers, students, parents and staff to think about how technology can fundamentally turn old pedagogy on its head.

This Special Report will address these issues from different perspectives in the education

community. It discusses the considerations IT leaders need to make as they integrate technology on campus and into the classroom. For teachers, curriculum specialists and academic leaders, it explores how to manage technology effectively to spark student interest and reap the anticipated rewards.

Our goal is to provide guidance on the most important areas institutions should focus on to ensure classroom management success.

Throughout this report, you will see sections and topics that may not seem directly related to classroom management. These sections discuss planning for technology implementation and network considerations for 21st-century devices and content, as well as finding the best learning models, perfecting professional development and, finally, achieving effective classroom management strategies and technologies.

The reason these other topics are included is simple: Failure in any one of them will dramatically impact your faculty's ability to be effective in the classroom. Classroom management in an age of technol-

ogy is difficult, if not impossible, if instructors can't get devices connected to the Internet. It's harder if they have inadequate professional development and even more difficult if the instructional model is outdated or ineffective.

Therefore, our goal is to provide guidance on the most important areas institutions should focus on to ensure classroom management success. ■

SMOOTH ROLLOUTS, EFFICIENT MANAGEMENT, EFFECTIVE SECURITY

Planning Makes Perfect

In every interview conducted for this report, this question was asked: “What do you think are the biggest lessons learned from the last decade regarding bringing technology into classrooms?” Invariably, the responses focused on the importance of planning, strategy, and the need to define goals and then match technology to those goals, not the other way around.

“It isn’t technology that ‘defines’ institutional direction. People define how technology is deployed, not the technologies that people invent,” said one astute interviewee. It may seem like common sense after the fact, but hindsight is 20/20 and it’s much easier to spot a problem from the outside looking into the storm, rather than from the middle of it. Following are critical points to remember as you enter arguably the most important phase of an implementation — planning.

Every Stakeholder Matters

George Bernard Shaw once said, “The single biggest problem in communication is the illusion that it has taken place.” In other words, you may think you are sharing information with stakeholders, but are you getting their feedback and truly communicating? Are you including everyone — even non-“techies” — in the conversation? For leaders of all stripes, the lack of communication with all stakeholders can mean a failure before takeoff.

It’s easy to understand how it happens.

In education institutions — or any large entity for that matter — it’s common for busy faculty, staff and administrators to fall into silos, dedicated to their own department, invested in their own challenges, but unaware of the issues affecting their peers. However, no school, department or staff member is an island within an education entity and this lack of communication can create uncoordinated plans, duplicative efforts or unpopular initiatives.

CDE’s survey conducted for this report asked education leader respondents to answer this question: ***“Do you feel there are silos within your entity (i.e. decisions affecting the enterprise are routinely made by one department without input from others)?”***



FutureStructure Insight:

No school, department or staff member is an island within an education entity. Lack of communication between and among departments can create uncoordinated plans and duplicative efforts. Decisions made in one part of the education system impact other areas. It’s important that leaders understand the interconnectivity between and among people and systems.

The answers were a resounding yes. Respondents were allowed to provide clarification. Following are some of their statements:

“Yes, IT and other high-level groups often say, ‘This is what we’re going to do’ instead of asking what will truly work.”

“Yes, the people that buy things don’t always connect with users.”

“Yes, between the academic side of the house and operational.”

“Yes, departments are siloed, and even within departments, faculty and staff do not communicate with one another effectively.”

“Oh yes, departments buy software to get their jobs done and no one has the big picture.”

And this one, which arguably says more as a no than as a yes:

“No, decisions regarding technology are managed by IT.”¹

The 2014 State of ResNet report further illustrates this reality specifically for higher education. The report, based on a survey of more than 500 IT, business and housing officers, found that one out of every five respondents did not meet with their counterparts in the other leadership categories. As another example, 44 percent of 123 housing officers expressed concern about how they would continue to meet residential network demands. But only 9 percent of their counterparts in IT voiced the same concern.²

“The governance framework needs to include all of the stakeholders that are part of your community. This includes administrators,

➤ Quick Tips: Proper Planning Pays Off

- **Take care to build organizational structures** like governance that proactively bring key decision-makers from various leadership roles to review, support, connect and provide stewardship to plan for the future.
- **You have two ears and one mouth** — use them in that proportion. Make sure to get input from all stakeholders — particularly those individuals who will actually be using the devices and other implemented technologies, including students, faculty and staff. It might seem like a no-brainer, but this step is often overlooked.
- **If you’re a CIO or other technology leader, keep an open mind** and work with academic staff to collaboratively implement what will be most effective and impactful for students. At the end of the day, everyone’s goal should be improving student learning.
- **It’s a marathon, not a sprint.** Once you have the funding and the stakeholder support, it’s tempting to push “go” and get to the finish line. But slow and deliberate wins this race. Research, combined with various pilots, will help you iron out details and confront any issues before you hit prime time.

faculty, staff and students, but also potentially alumni, donors and community members,” says Dee Childs, associate provost and CIO at the University of Alabama in Huntsville (UAH). “There is room for everyone at the table.”³

Be a CIO, Not a CI‘No’

In the not so distant past, technology was solely the responsibility of the IT department and IT made decisions regarding the technological resources that would be available to instructors, staff and students. But this is changing as technology becomes integral to outcomes and emerging educational assessments and standards, which

require students have access to digital tools and be equipped with digital skills. Outcomes are tied to curriculum and curriculum is dependent on technology, which means IT's job is not only significantly more complex, but its decisions must be in-sync with the academic goals for the institution.

"IT needs to give their input and talk about their concerns, but if there is a device that teachers really think is going to be the most effective way to reach their kids, then IT needs to learn to support that device effectively," says Jeremy Shorr, director of educational technology and curriculum innovation at Mentor Public Schools, located in Mentor, Ohio. "We're lucky in Mentor to have an IT team that is dedicated to putting learning first."⁴

If you're in IT, you may be hesitant and concerned that off-the-wall requests will send your department staff down a technology rabbit hole. To ensure students and educators have access to the tools they need, it helps to anticipate what instructors might request and be prepared to provide it quickly.

"We have a technology menu," says Anton (Tony) Inglese, chief information officer at Illinois' Batavia Public School District 101. "Teachers can pick anything off of that technology menu as long as they have funding for those purchases and we will deploy them at any time. Generally that fits upwards of 98 percent of our students' and teachers' needs. For the other 2 percent, we sit down with them and walk through what they are trying to accomplish and we see if there are any existing solutions that fit their needs. If there isn't, we will come up with a solution."⁵

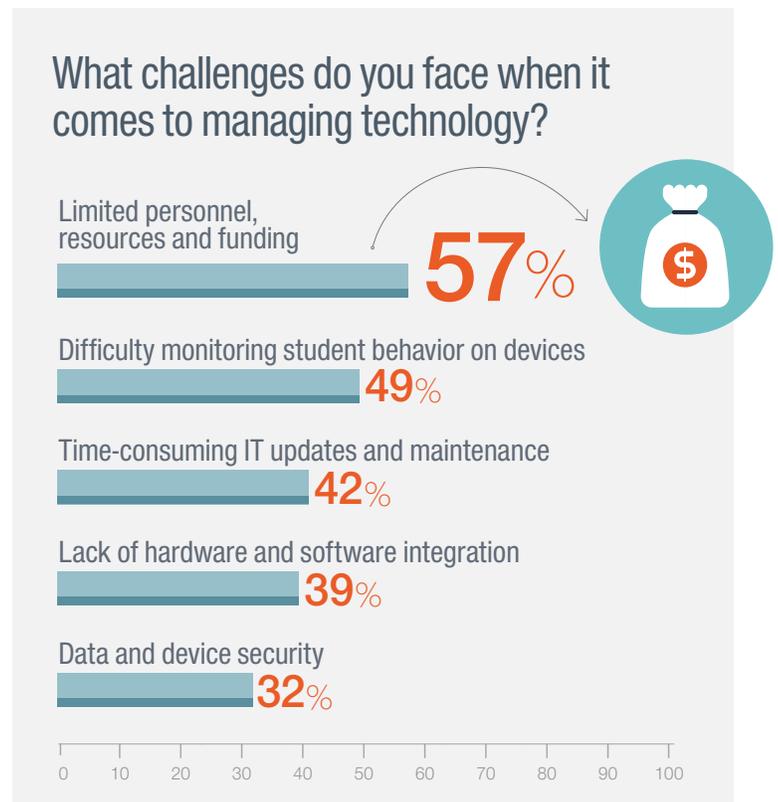
In higher education, the CIO's role is increasingly both academic and business oriented, meaning IT needs to be a partner in the strategic vision of the campus. "The whole focus of IT is no longer keeping the lights on, making the video go," says Thomas Hoover, associate vice chancellor and CIO of the

University of Tennessee at Chattanooga. "It's more helping the university fulfill its strategic mission, which is engaging in the classroom and helping the professors to utilize technology."⁶

Move Cautiously – and with Purpose

Technology implementations, particularly those that will get devices or other tools in students' hands, are understandably exciting for IT staff, administrators, teachers, faculty and others who are heavily invested in and passionate about improving student outcomes. Getting the money to fund such initiatives is a battle in itself, and when that battle is won it can be tempting to purchase and deploy the technology as soon as possible. Don't be lured into this trap.

While it may be difficult, moving slowly, with coordination, allows for input and small implementations or pilots to build the foundation



Source: CDE Research Survey on Classroom Management, 2014

of a long-term plan, which has been several campuses' ticket to success. As an example, the school board at Batavia Public School District 101 recently approved a 1:1 initiative that will be implemented over the next two years. But before getting to the point of approval for a school-wide implementation, district leaders worked for the last three years to ensure they successfully executed the initiative, implementing various pilots, including a pilot for sixth graders and another in an elementary school that lasted two years. "We want to build on those successes," Inglese says.

At Washington County Public Schools in Maryland, Jim Corns, chief operations officer for Instructional Technology, says the district is planning to build off the 1:1 success seen in one of its magnet schools, the Emma K. Doub School for Integrated Arts and Technology.

"That program is running fantastically and it's driven solely by good instruction," says Corns. "Our goal is to take that magic and replicate that instructional model in other buildings because it's proven that it works and it's driven by great instruction and great instructors."⁷

Northampton Community College piloted its Innovation Lab, much like this one, in fall 2013.



**FutureStructure
Insight:**

“The governance framework needs to include all of the stakeholders that are part of your community. This includes administrators, faculty, staff and students, but also potentially alumni, donors and community members. There is room for everyone at the table.”

Dee Childs, Associate Provost and CIO, University of Alabama in Huntsville

Northampton Community College (NCC) in Pennsylvania created an Innovation Lab that features high-tech tools and focuses on collaboration and creativity. More than that, though, the college, which built the lab based on best uses seen in other colleges, hopes to use the lab as a model for future classroom designs.

The college first piloted the lab in fall 2013 and then expanded its use in spring 2014. Now it plans to expand the layout to its campus in Monroe County, Pa. NCC Director of Online Learning Doreen Fisher says the lab is constantly evolving based on faculty and student feedback.⁸

Network Considerations for the Campus and Classroom

Nothing can bring the hum of technology-based learning to a grinding halt like a network issue. No faculty member wants to see the words “cannot connect to Internet” with 25 pairs of eyes — or many more if you’re in a college lecture hall — staring them down. Or, have “buffering” pop up on a YouTube video when students are engaged and waiting to learn.

Building a strong foundation for classroom technologies with a stable network is crucial if you want instructors to manage their classrooms effectively in a digital age.

Before Manteca Unified School District (MUSD) — a school district with 23,000 students in California — began its 1:1 initiative, leaders knew their network infrastructure needed a massive overhaul.

Colby Clark, director of Information Technology for the district, describes the previously antiquated network: “We didn’t have standardization. We had multiple vendors and makes and models of network equipment. We didn’t even have gigabit to the desktop and we couldn’t install wireless access points throughout the district because we didn’t have the network infrastructure to connect it to.”

MUSD began a forklift upgrade at every district site, focusing on building an infrastructure that would give it seven years of life. Fiber-optic cable — connected at 40Gb/s — was installed from the main network cabinet at every campus out to all of the intermediate distribution frames (IDFs) scattered throughout the campus. Wireless access points using 802.11ac technology is now in every classroom, including empty classrooms district leaders believe they will expand into in the near future.⁹

Robust Means What?

Ask what a school needs in a network, and the typical response is: “It should be robust.” Robust has become the overarching phrase that separates a good network and an insufficient network. But what does this mean? While that answer is different for every campus, there are national guidelines and opinions regarding necessary bandwidth.

For K-12 schools, the Federal Communications Commission (FCC) provides some benchmarks: “I want to see 100 megabits to every school per 1,000 students by the 2015 school year,” says Jessica Rosenworcel, a 2012 appointee to the FCC. “And then I want to see a gigabit to every school per 1,000 students by the end of the decade. I call that ‘dream likely’ and ‘dream big.’”¹⁰

Partnership for Assessment of Readiness for College and Careers (PARCC) and Smarter Balanced — the two state-led consortia developing next-generation assessments aligned to Common Core State Standards (CCSS) — also provide minimum and recommended guidelines for K-12 schools. However, even these have variation. PARCC says schools need a minimum of 5kbps/student with caching and 50kbps/student without caching. Smarter Balanced projects schools will need 10 kbps/student for assessment purposes.^{11,12}

For higher education, network needs are even trickier. It is almost a certainty that students in a college environment will have more than one device, perhaps even three or four, and those students need and want wireless access in lecture halls, classrooms, student dining areas, residence halls and everywhere in between. Not only do these students have more devices, but they are using them for increasingly bandwidth-hungry applications.

➤ Quick Tips: Nurturing the Network

- **Think about the future.** Network expenditures are a big investment, so it’s important to predict what demands will be placed on your infrastructure in coming years. Think of the network more as a utility, and not as a static resource. Bandwidth should be built on a growth model with annual planned increases. As a utility, budgets are built dynamically with contingency if use exceeds predicted budget.
- **Thoroughly calculate bandwidth needs.** It’s tedious, but worthwhile to conduct a complete evaluation of which applications, software and other technologies are eating the most bandwidth and how many students are accessing these technologies. Think about how much bandwidth would be needed if these students were all in the same place at the same time.
- **Make sure to first focus on the areas that need network connectivity the most.** If your institution has a limited budget (who doesn’t?), it may not be possible to have robust bandwidth everywhere all at once.
- **Think about how the network supports instruction, operations and research.** Decisions regarding the network have a significant impact on other departments.

“A lot of the pressing needs for more bandwidth have to do with video — and not only video, but high-quality video,” says the University of Alabama in Huntsville’s Childs. “If you’re streaming a video for one person, it’s one thing, but if you’re streaming for 10 people or 100 people or, in the case of a MOOC, thousands of people, the needs for bandwidth are huge.”

The importance of investigation — no matter how big or small your institution — cannot be overstated. Dig deep into Internet usage on your campus. For example, do you know what application has the highest per-student bandwidth requirement? Can you try and predict what it’s going to be three years from now? Is your system designed to handle this load?

To accurately assess bandwidth needs, it’s important to list all online tools and resources leveraged within the institution and determine the minimum and recommended requirements per student. Then, look at how many students may be accessing those applications or the Internet at the same time, in the same place. This is particularly important for online assessments in K-12, where students must have reliable connectivity.

Deciding on Devices, Mitigating Management

The first thing to know about devices in education is that this should never, under any

circumstances, be the first decision made — or even the third or fourth for that matter — when planning for a technology implementation.

When you decide on a device in the beginning, it severely limits your choices moving forward. It’s beneficial to first determine the academic outcomes you wish to achieve and then pick the best tools to build that environment and let the technology adapt to you by picking the device that best supports your goals.

When it is time to look at devices, don’t automatically follow the status quo. As with everything else, get the opinion of faculty, staff and students. Let them use the device — preferably through a formal pilot, but if not, at least on an ad-hoc basis.

MUSD was thoughtful in its choice of a rugged 2-in-1 convertible device that was built specifically for the K-12 classroom and comes with a detachable keyboard and digital stylus. “What has been pre-loaded onto this device and the software that is available is amazing,” says Jason Messer, superintendent of MUSD. “I had a teacher say to me, ‘As a teacher, this device has everything I need and want.’ That helped me to solidify the decision.”

Making Management Less Painful

As more campuses embark on device implementations, or, in the case of higher education, take on the support for thousands of devices, mobile device management has never been more vital. Many technological solutions exist on the market, each with varying capabilities and features. Some of these features include giving IT the ability to secure endpoints from a single console; allowing faculty to lock students from accessing certain apps or Web pages without the help of IT; ensuring devices are compliant with policies in real time; enabling remote wipe capabilities if a device is lost or stolen; preconfiguring apps for students, faculty and staff; allowing IT to efficiently stage and image devices; and enabling the efficient deployment of software and updates.

➤ Quick Tips: Device Decisions

- **Never decide on a device at the beginning of planning.** Determine your academic goals, the tools you need to achieve those goals and let the technology adapt to you, not the other way around.
- **Don’t just follow the status quo or pick devices because they’re “hot.”** Research your options and select what works best for your students and staff.
- **Let your faculty, students and staff experiment** with the device, preferably through formal pilots.

As with any technology, it's important to determine the capabilities your institution is most interested in and then find the solution that meets those needs. Be sure to talk to various vendors, though, as they can make suggestions that you may have not thought of or even knew existed.

Security and Privacy

In 2010, Bruce Schneier presented “The Security Mirage,” a TED Talk that discussed how the feeling of security and the reality of security don't always match. Schneier pointed out that cognitive biases regarding security routinely impact our risk decisions. These cognitive biases include things such as our tendency to downplay common risks while we exaggerate spectacular and rare risks. He also points out that we frequently see the unknown as inherently more risky than the familiar and we tend to underestimate risks in situations we feel we control.¹³

It's important to keep these truths in mind at your institution so you can view security through a realistic lens and institute appropriate policies and counter measures. For example, while we might think our data is consistently stolen by an organized band of cyber criminals in a faraway country — because this is unknown, spectacular sounding and something we can't control — consider that, according to a 2014 Internet Security Threat Report, 29 percent of data breaches were caused by information accidentally being made public.¹⁴

There is no doubt security — in every entity, everywhere — is exponentially more complex as technologies proliferate. A decade ago, IT departments primarily had to concern themselves with patching and closing vulnerabilities within operating systems. Now, the threats have moved from the operating system to the third-party applications, email and websites that students and staff access. The simple act of clicking on a link from an untrusted source may launch a full-scale attack.

This complexity has caught up with various institutions that now have the unfortunate honor



FutureStructure Insight:

When looking at security and privacy, continuously ask yourself how these two things impact devices, networks, applications and more. Connecting these dots will help ensure security is a part of the overall system, and not a one-off initiative.

of serving as a cautionary example, including the University of Maryland, where the records of 300,000 people were exposed, and Indiana University, where the Social Security numbers of 146,000 students may have been breached.^{15, 16}

For institutions of all sizes, it's important to first understand that breaches are not only happening somewhere else, to someone else — they can and probably will affect your institution at some point if they haven't already. Governance, risk assessment and compliance are important steps to providing a framework for data backup — whether on premises or in the cloud — as well as threat detection and recovery. Inventory control systems are also critical as they help institutions gain a view into potentially vulnerable assets. Additionally, access control limits the information that is unnecessarily exposed.

Filtering the Network, Creating Digital Citizens

For every education institution, there are several aspects of IT security — including protecting the network, data, devices and students from accessing inappropriate content. Institutions must work to prevent intrusions, and when unsuccessful, respond to security failures as quickly as possible.

For most institutions, a common line of defense is using a filter to keep out offensive material. For K-12 schools, this is imperative to comply with the Children's Internet Protection Act (CIPA). While filters work to keep the truly bad stuff out of

Due to the complexity of BYOD programs, some education institutions are moving away from securing student-owned devices and focusing on secure data initiatives instead.



students' reach, they typically don't catch everything. It's also important to not be too draconian with filter use and inadvertently impede students' ability to access needed content and resources.

For this reason, it is critical for institutions to educate students of all ages on what they should do if they encounter inappropriate material.

Manteca Unified School District Superintendent Messer says he focuses on supporting teachers and teachers engaging students to be responsible. "We are holding the kids accountable. One thing we learned from talking to another district where the students buy the device is that they give the students 10 minutes of 'tech time.' If students alter their device and make it inoperable because they are doing something they know they shouldn't be doing, the technician spends 10 minutes trying to fix that device, and if they can't, they wipe it clean."

Securing Data, Not Devices?

Although a 1:1 initiative complicates security for an institution, it has nothing on bring your own device (BYOD) programs where IT needs to protect something the institution doesn't own. The trend has created serious concerns about data breaches as security is no longer as simple as installing anti-virus software on all institution-owned devices.

The brief, "Simplifying Bring Your Own Device (BYOD) in Education," proposes security tips for institutions with an influx of

devices. While these tips are specifically for BYOD, they can also apply to institutions with 1:1 or other technology implementations.

- **Focus on data,** apps, users and devices.
- **Consolidate user rights monitoring** into a single engine to provide a comprehensive picture of a user's activities from the time the user enters the campus (virtually or physically), as well as when and how the user accesses each system, application and piece of data.
- **Monitor proactively.** Put controls in place to prevent access to anyone whose behavior triggers an alert.
- **Know the environment.** When suspicious activity is detected, analyze all the digital fingerprints to identify the cause of the problem. Utilize reporting tools on all registered device activity.
- **Leverage application monitoring** and scanning tools, including manual processes, to help identify security defects in code written by third parties. Use a full-scope SDLC (software development life cycle)-based review process where needed, as well as governance and auditing, to ensure apps meet compliance requirements.
- **Ensure all users are trained** in proper use of network and applications.
- **Draft and communicate easily understood policies** around permitted use to counter risks to regulatory compliance, and maintain adherence with Family

Educational Rights and Privacy Act (FERPA), CIPA and Health Insurance Portability and Accountability Act (HIPAA) regulations.¹⁷

Temple University, located in Philadelphia, Pa., enacted a new policy in January 2014 that focuses on securing data, not the device. The university categorizes data in one of three ways — confidential, sensitive and unrestricted — and created a set of protocols on how each type of data should be accessed.

“We started looking at this, saying ‘Where should people really be allowed to store data?’” says Larry Brandolph, chief information security officer and associate vice president at Temple. “Then it became more of a conversation not about where to store data, but what types of data we could store where.”¹⁸

Going Beyond Privacy Compliance

It is hard to believe, but FERPA — the go-to federal law on protecting student privacy — was passed 40 years ago, in 1974, long before the personal computer was introduced. Since then, the necessity of keeping student information private remains the same, but the complexity of achieving this has increased exponentially as mobile devices, social media sites and other staples of a technology-driven world have proliferated.

In February 2014, the U.S. Department of Education’s Privacy Technical Assistance Center (PTAC) released guidance to help school systems and educators interpret and understand the major laws and best practices protecting student privacy while using online education services. The guidance summarizes FERPA, but urges schools to go beyond compliance to follow best practices for outsourcing functions using online educational services, including computer software, mobile applications and Web-based tools.

At <http://ptac.ed.gov>, education faculty and staff can access student privacy training videos, best practices and other resources.

Fred Cate, senior fellow at the Center for Applied Cybersecurity Research at Indiana University — Bloomington, as well as a law professor at the university, says that while compliance with federal mandates is certainly important, privacy issues go well beyond laws like FERPA.

“We know a lot about our students,” Cate says. “We tend to give them ID cards that let them shop on campus. They check out books with it so we know what they read; we know what magazines they buy; we know what health products they buy; they go to our health centers and we know what doctors they see. We have that information not as providers of education, but as providers of services that students take advantage of every day. Every time they swipe that card we collect the data.”

As Cate points out, a law written in the 1970s doesn’t provide very helpful guidance on issues brought about by the evolution of technology. Privacy is difficult for higher education institutions where lines are blurred and there really is no concrete definition for what privacy is or what constitutes a lack of privacy.

“We really need to think this through. Privacy is hard to define. Some people — even experts — describe privacy violations as ‘creepiness.’ Do you really want your students to be saying, ‘I was totally freaked out when I found out the university knew X about me.’? These are all things we need to consider.”¹⁹ ■

➤ Quick Tips: Safety First

- **Look at your risks realistically.** Many breaches are a result of human error and system glitches, so be sure to mitigate these with appropriate staff training and machine maintenance.
- **Filter the network** in accordance with federal, state and local laws but don’t be so draconian in your measures that you impede student learning. This requires a delicate balance.
- **Devices are multiplying and it’s hard to keep up.** Consider focusing on protecting data first.

MASTERING THE ART OF TEACHING WITH TECHNOLOGY

To technology advocates, the phrase “teaching with technology” concisely sums up the entire problem. It’s redundant and contains two superfluous words: with technology. Technology use in teaching should be inherent, they argue, and as routine and commonplace as a pencil and paper once were — and, to some degree, still are. Unfortunately, we aren’t there yet.

We have our excuses — most of them very good ones. Lack of funding, inadequate Internet connections, insufficient architecture, more pressing problems with which to deal. But if we stripped these problems away and assumed money was plentiful (this is a dream world, remember) and we were bursting at the seams with bandwidth, we would still have one fundamental challenge: Lack of effective training for instructors.

“Roughly half of our teachers say they lack professional development to use technology effectively in the classroom. That is unacceptable,” says Dr. Joseph South, deputy director of the Office of Educational Technology at the U.S. Department of Education.²¹

South was speaking at a Congressional Briefing to discuss the results of Project Tomorrow’s 2013 Speak Up survey report, “The New Digital Learning Playbook: Advancing College and Career Ready Development in K-12 Schools.” The survey, which queried teachers, administrators and parents about the role of technology in learning, makes other insights with regard to teachers’ ability to integrate technology effectively (see Role of Technology in Learning sidebar).

The fact that 23 percent of instructors with less than 3 years of experience said their teaching program did not prepare them well for technologies in the classroom shouldn’t be surprising, says the National Council on Teacher Quality. In 2013, the group analyzed

Role of Technology in Learning

“The New Digital Learning Playbook” makes insights regarding instructors’ ability to integrate technology effectively. Among them:

58% of district office administrators said that **enhancing teacher effectiveness** through professional development and school-based professional learning companies will have the greatest impact on student achievement.

50% of educators, regardless of their level of experience, said **“learning how to differentiate instruction using technology”** was No.1 on their wish list for professional development.

23% of instructors with less than 3 years of experience (the “new generation” that is typically more comfortable using technology than previous generations) said their **teaching program did not prepare them well** for using technologies in the classroom.²⁰

Source: www.tomorrow.org/speakup/pdfs/SU13Educatorreport_WEB.pdf

more than 600 teacher preparation programs and found that only 15 percent required teacher candidates to explain how a digital tool would support student learning.²²

We've identified the problems, so what are some solutions?

Success at a Cost

A recent article, "In Singapore, Training Teachers for the 'Classroom of the Future,'" notes that, according to international assessments, Singapore has one of the best educational systems in the world — partially due to its teacher training program. Singapore's National Institute of Education (NIE) is an agency whose mission is to ensure the country's educators are ready for the classroom. NIE requires prospective instructors to take an Information and Technology course in their first semester, which prompts them to think about what digital tools they would use during a particular lesson. The glitzy "Classroom of the Future" — a prototype lab with a touch screen-filled café and a video-conferencing global classroom — challenges educators to think about how technology can change education.²³

We know what you're thinking: Money. Singapore invests approximately \$10.6 billion per year in education to serve a little more than half a million students. In comparison, the U.S. spends roughly \$141 billion each year for almost 55 million students. Using these estimates, that means Singapore spends \$21,200 per student compared to \$2,500 in the U.S.

Saying this is a sizeable difference is an understatement. It's a Grand Canyon-sized chasm. To bridge the gap, we have to get crafty.

Winning Workshops on a Budget

Jim Jorstad, director of Academic Technology Services at the University of Wisconsin — La Crosse (UW — La Crosse), leads academic



technology staff in planning and hosting year-round workshops to show educators how to use technology in their classrooms.

The workshops are successful and have engaged participants, with up to 80 people attending some sessions. Although the department has hosted the workshops for close to a decade, staff have only recently started holding multiple and frequent ones in the last several years. "The key is to be consistent with professional development so faculty expect it," says Jorstad. "Then you can develop a following and sustain your technology training program."

Jorstad says leaders should not underestimate the importance of marketing when it comes to getting faculty involved. The department gives sessions creative names like "Tech 4 U" and "Tech in 20" — a session where educators only spend 20 minutes to get help with a specific issue like using clickers. A session called "HOT" (Hands-On

"The key is to be consistent with professional development so faculty expect it. Then you can develop a following and sustain your technology training program."

*Jim Jorstad,
Director of Academic
Technology Services,
University of
Wisconsin — La Crosse*

Technology) features presenters who give how-to lessons, such as how to put a video into PowerPoint in two or three easy steps. In 2014, a short promotional video was created and distributed to faculty (www.youtube.com/watch?v=Xw7NUxFNGkc&feature=youtu.be). Within four hours, the workshop was filled causing staff to double the enrollment.

The strategy at UW – La Crosse can be particularly attractive because of the price point – Jorstad says the program does take faculty time, but does not require much of a monetary investment. However, while hard costs are limited, it's still important to get buy-in at the executive level. For this, Academic Technology Services hosts a "Passport to Technology" event in January each year and extends a special invitation to administrators who get the opportunity to converse with faculty and staff about the professional development sessions. Faculty can share the benefits of the sessions and administrators can be assured the resource investments are worth it.²⁴

Catalyst for Change

For Mentor Public Schools, professional development was – and still is – critical to the success of its blended learning program. The importance of supporting teachers is evident from the top down.

"If students are our 'products,' then teachers are our skilled workers," says Mentor Public Schools Shorr. "If teachers are our skilled workers, then everyone else's role is to support our teachers." Ridge Middle School Principal Megan Kinsey agrees: "We strongly believe that teachers working together sharing their insights and their expertise is really the way to develop individuals professionally," she says.

In conjunction with its blended learning initiative, Mentor launched the Catalyst Program, which allows elementary teachers to explore blended learning by traveling with students to a state-of-the-art classroom. This classroom includes an observation and conference area so that other teachers can watch and learn from the teacher using the classroom without disrupting students. The Catalyst Program was presented with the Ohio Trendsetter Award at the 2014 Ohio Educational Technology Conference (OETC). "High-quality professional development needs to be a top priority for schools when a new initiative is rolled out," says Mentor Public Schools Superintendent Matthew Miller. "The package that was developed here includes finding the best trainers in the region and nation to work with our teachers, and is coupled with ongoing support through our instructional coaching program."

➤ Quick Tips: Supporting Your No.1 Resource

- **Make sure your professional development is consistent.** If you are going to host workshops, it's important you schedule in advance and stick with it.
- **Marketing matters.** If you don't have passion for professional development, neither will instructors. Be creative in naming your sessions and make the content as engaging as possible.
- **Allocate time for educators to meet and discuss.** Change is hard, but it's harder when you feel like you're doing it alone. Don't isolate them. Let them propose ideas, problem solve or even commiserate about their challenges together.
- **If something isn't working, don't be afraid to change course.** Just because you have invested time and capital in one path doesn't mean it's too late. It's better to make the change and get back on track.



FutureStructure Insight:

Think about all of the components involved in achieving personalized learning. Look at devices, infrastructure, content, assessment and even workspace design and furniture. Remember, everything is interconnected.

Four teachers who were part of the initial 160-student rollout — Math Teacher Tom Dwyer, English/Language Arts and Social Studies Teacher Stephanie Dwyer, English/Language Arts Teacher Carmen Walker and Kindergarten Teacher Tracey Dunn

— all agree that professional development, administrative support and the time set aside (45 minutes each week) to meet with each other were crucial for their success.

“The time they gave us together was the best support we could have had,” Walker says. “We were able to get together once a week and throw ideas and issues out and problem solve together. Without the administration providing that, it would have been frustrating and we would have felt isolated.”

Mulling Over Models: What Works Best

The story goes that *Sesame Street* was born during a 1966 dinner party conversation between television producer Joan Ganz Cooney and Carnegie Foundation Vice



Mentor Public Schools provides educators with professional development related to classroom technologies. Top: Jeremy Shorr, Tom Dwyer, Matthew Miller, Tracey Dunn. Bottom: Megan Kinsey, Stephanie Dwyer, Carmen Walker.

GARY YASAKI



“We are really big on finding the instructional program and then finding the tools that support that program. We want to make sure it’s the best use.”

Jeremy Shorr, Director of Educational Technology and Curriculum Innovation, Mentor Public Schools

GARY YASAKI

Jeremy Shorr, director of educational technology and curriculum innovation at Mentor Public Schools, opted to engage students through small group instruction supported by technology.

President Lloyd Morrisett. The question at hand was: Can television teach? They agreed that yes, it could. The follow-up question was: Can we use television to teach kids and make them more prepared for school? The answer to that was *Sesame Street*. Forty-five years after it first aired, *Sesame Street* has 153 Emmy Awards, is broadcast in 140 countries and it is estimated that 77 million Americans watched the show as children.

Malcolm Gladwell has remarked, “*Sesame Street* was built about a single, breakthrough insight: That if you can hold the attention of children, you can educate them.”²⁵

Sesame Street demonstrates that the principles of effective education are timeless and don’t change, regardless of technological inventions. You cannot teach children unless you gain their attention, or, put another way, *engage* them.

In recent years, various models, including online learning, blended learning and the

flipped classroom have emerged on both K-12 and higher education campuses — like *Sesame Street*, all of them seek to use a new medium (in this case, the Internet) to further engage and teach students.

These models are increasingly gaining in popularity. According to iNacol (International Association for K-12 Online Learning), 25 states had state virtual schools operating in 2013-2014.²⁶ Additionally, a 2012 study by the Online Learning Consortium found that more than 6.7 million students were taking at least one online course and that 32 percent of higher education students were taking an online course.²⁷

“Ten years ago, it might have been nice for us to offer online learning options,” says David Shulman, campus president of Broward College Online. “Today, online learning has become a strategic part of what we do.”²⁸

Education institutions are also seeking to personalize learning. A 2013 CDE survey of 120 K-20 leaders found

that 63 percent of respondents said a personalized learning environment was a top priority of their institution.²⁹

While these models are designed to better engage students and improve achievement, they also present education leaders with a dilemma. An entire TED Talk was dedicated to this “paradox of choice”³⁰ problem educators likely find themselves in. With so many models that can be mixed and matched to produce limitless hybrids with increasing technologies to support these models, educators may find themselves paralyzed to make a decision, afraid to make the wrong one.

Do Your Research

For educators unsure of where to start, Mentor Public Schools provides a successful template from which to draw for first steps. Already a highly rated school district, Mentor leaders wanted to make sure they weren’t resting on their laurels, but continuously improving. Mentor didn’t have a particular program in mind in the beginning or a specific device to purchase, instead, they decided to focus on how to best reach students. To do that, they started intensive research — a practice that continues today — and landed on small group instruction supported by technology.

“We’ve known for years that small group instruction is the best way to reach students, regardless of their learning style, their age, the time of day or the subject matter,” says Shorr. “It doesn’t matter; that’s the best way to reach students. So that’s what we focused on.”

Mentor found that small group instruction in the past had been hindered by the fact that while a teacher was working with one group of students, the other students were assigned to “busywork” like worksheets. “Students can smell busywork a mile away and teachers knew it was busywork too,” says Shorr. But integrating technology with small group instruction changes the game. “We are finally

at a point where we have enough high-quality content and tools for students to engage with that they are still learning at a very high level when they aren’t in the small group, which frees the teacher to focus,” says Shorr.

Mentor leaders visited 16 school districts before deciding how they wanted to implement their program. They found that many times, students had their heads down, consumed with the devices, regardless of the subject, time of day or age of student. “We didn’t want that,” says Shorr. “We are really big on finding the instructional program and then finding the tools that support that program. We want to make sure it’s the best use.”

Regardless of the model you choose, it’s important to do your research as Mentor did. You know your students better than anyone else and what works well for one institution may not be the best choice for another institution. It’s also critical that leaders get input from all stakeholders along the way. If something isn’t working, don’t be afraid to change course.

“We might think something is going to be the way forward and we invest capital and time into training, but if it turns out that’s not the best way to reach students, we’re going to rethink it and go back,” says Shorr. “That’s what ended up happening for us.” ■

➤ Quick Tips: Personalizing Learning

- **Don’t get caught up in labels or find yourself in a “paradox of choice.”** Focus on engaging students, increasing interaction and personalizing learning.
- **Do your research.** If something failed at another campus, find out why and learn from its mistakes, but also realize that you know your students and staff best. Don’t be afraid to tweak the model to fit your institution.
- **Think about all of the components involved in achieving personalized learning.** Look at devices, infrastructure, content, assessment and even workspace design and furniture. Remember, everything is interconnected.

SOLUTIONS TO SUPPORT DIGITAL LEARNING

Creating a Vision with Measurable Goals

Despite the adoption of new, emerging technologies around the globe, education institutions have often fallen victim to lack of vision. Many times, these schools are applying analog thinking to digital technology.

Some examples of analog thinking include:

- Lecturing with an expensive interactive whiteboard to present the same information in much the same way we did with a 5-cent piece of chalk 20 years ago.
- Creating a reading assignment in a digital textbook that is similar to a paper textbook, but requires an expensive device to access.
- Using YouTube in place of yesteryear's film strip.

These are all modern-day iterations of learning by reading, hearing and watching — incredibly passive activities. The problem is lack of vision and the result is investing in expensive technology to achieve the same results that could be done at a much lower price point.

A successful vision often comes from a passionate individual in a high-level position, like a superintendent. This individual, combined with another passionate leader in IT, like a CIO, can create a perfect partnership for transformation. These two people realize that IT not only means information technology, but also instructional technology.

With a vision, campus leaders can — and should — define goals. But avoid goals that aren't measurable, such as "giving students a 21st-century education." There is no way to

measure your success and you can only be as successful as clearly defined as your goals are. The more definite and concrete the goals, the more mechanisms you can put in place to measure against those goals.

Here are some examples of clearly defined goals that can be successfully measured:

- The percentage of all students in grades 2-4 in our district who test at the correct reading level for their grade will increase from 85 percent to 95 percent by 2016.
- The percentage of all students in grade 11 who are on track to be college-ready for mathematics as measured by "X" assessment will increase from 60 percent to 75 percent by 2015.
- The percentage of our undergraduates who are employed in their chosen field 6 months after graduation will increase by 15 percent in 2 years.

The Age-Old Problems of Distraction, Procrastination and Zoning Out

Social media, applications, games, cat pictures on the Internet (you laugh, but according to Friskies, 15 percent of Internet traffic is related to our feline friends³¹) — they all have a tendency to suck even the most productive individual into their black hole of procrastination. So it's logical to be concerned about students' ability to stay on task and remain engaged in educational matters during instruction time.

Recently, Weber State University in Utah challenged its students to explore technology's impact on their learning in a course titled, "Is

Technology Making Us Stupid?" The course was inspired by an EDUCAUSE listserv conversation with campus CIOs where one participant noted that many faculty members were frustrated with students distracted by laptops and mobile devices.

The class created "concentration labs," which allowed instructors to monitor students completing assignments. In some cases, students had unlimited access to the Internet and in other cases, they had none. As expected, access to the Internet created distractions worthy of students' attention. One student wrote:

"I have been distracted by everything else I'm capable of doing on a 'screen' while writing an essay. ... I routinely stop writing and check my email, or I am at the disposal of any other wandering thought I get while writing essays. I think I even started to shop online while I was in the middle of this essay..."

So maybe technology is making us stupid. Or at the very least, prone to pay attention to pretty much anything but the task at hand. Or maybe not. When students were not allowed to access the

Internet in a concentration lab, the results were not so different. One student wrote:

"I was and will always continue to be my biggest distraction. ... As I sat writing I found myself very distracted. ... The constant clicking of my typing and even the sound of my own breathing seemed to get louder and louder and my thoughts continued to wander farther from the subject at hand as more time elapsed. I found that the lack of distractions was a distraction in and of itself."³²

Students not staying on task and becoming distracted at any age is not a new problem — the Internet's fantastically entertaining diversions may sweeten the deal, but human nature suggests if an individual is uninterested in a task, he or she will find something else to do — whether that means staring into space or playing Angry Birds.

As Mentor Public Schools Math Teacher Tom Dwyer says, "Teachers have always had issues with making sure students are on task — even in a traditional classroom. In the past students would zone out and you would think maybe they weren't



DAVID RIDD

Some educators may think technology leads to distraction. But a study by Weber State University in Utah found that students were distracted with or without technology if they were not engaged in the task at hand.

paying attention. Now I can see them using their tablet, turning it like a steering wheel so I know for a fact they aren't paying attention."

So what's the answer? "You need to ask yourself why your students are zoned out or why they are not using the tool appropriately," says Dwyer.

"Sometimes we have this misconception that when kids have devices, we can sit back and they just learn electronically and we oversee the process," says Walker, Mentor Public Schools English/Language Arts teacher. "But that is most certainly not the case. You need to be up, around, visible, available, probably even more so now that distractions are readily available."

"If you want your students to go off task, hand them a device and then give them a nebulous set of instructions regarding what to do with it."

Jim Corns, Chief Operating Officer for Instructional Technology, Washington County Public Schools

Washington County Public Schools CIO Corns echoes these thoughts. "The same thing that has always been the best classroom management tool is still the best classroom management tool — and that is a rock solid lesson plan," he says. "If you want your students to go off task, hand them a device and then give them a nebulous set of instructions regarding what to do with it."

Ask yourself if the assignment, lecture or content is engaging. Are you using digital tools to the highest purpose you can? Are you lecturing to students or allowing them to collaborate and create?

Technologies that Monitor, Tools that Engage, Solutions that Simplify

While good old-fashioned instruction may be the key weapon in the fight to keep students on task, as always, technology can lend a hand. Following is a list of some of the tools that can

help instructors engage students and keep them on task, as well as simplify classroom management strategies. While this list is certainly not comprehensive, and, even if it were at present, there is new technology emerging every day, it provides a good starting point for exploration.

Regardless of the tools you choose, it's important to ensure the technology is simple to use. Educators have plenty of work on their plates and students are used to their own technology and tools. If you put additional burden on faculty and students with education-specific technology, it might be more of a detriment than a benefit.

It is also important to keep in mind that device operating systems have native software and capabilities built in. A good approach is to take the best of those native built-in tools and then leverage additional technologies and software that complement and build on them.

Apps and Web Tools

Much like our personal lives, there is typically an app for almost anything you want to do in education and many of them deal specifically with overcoming classroom management hurdles. Numerous websites feature "top 10" or other lists that recommend the best of the best when it comes to classroom management apps, and, even better, many of these apps are free.

Faculty and staff should be cognizant of their institution's policies on downloading software and apps before making any decisions and should inquire if the benefits they are seeking from a particular app is a feature of software the institution already owns. This can be the case if the faculty or staff member is not as familiar as he or she needs to be with recently implemented technology or has not received proper training. Many learning management systems, educational platforms and other classroom-based software have free apps associated with their products.

Other Web-based tools some institutions are using to engage students are blogging and digital

storytelling. Jennifer Sparrow, now the director for online and innovative learning at Case Western Reserve University, developed a blogging program for students while serving as the senior director of networked knowledge ventures and emerging technologies at Virginia Tech. Sparrow says blogging is an effective teaching tool that increases student engagement and drives students to produce their best work.

“With blogging, students are very much becoming creators of content — they are writing, reflecting and engaging with other students and faculty,” says Sparrow. “The blogging platform gives students ownership of what their work looks like online and they can tweak it according to what they want their voice to be. Students’ writing improves when they are writing for a larger audience.”³³

Sparrow and fellow higher education leader Jorstad are also proponents of digital storytelling. Sparrow says the practice helps students to discuss what they are researching and to think about how they tell their story to make it impactful, giving them the opportunity to create some of the resources they already routinely consume, like YouTube videos.

Jorstad, who promotes and helps faculty implement digital storytelling and reporting on the UW – La Crosse campus, says students writing for the Web helps bring authenticity and relevancy into the classroom. Jorstad himself regularly writes iReports for CNN and currently has more than 1 million readers.

“(Digital storytelling and reporting) helps students learn how to write better and improves their analytical thinking skills,” says Jorstad. “It also helps them understand how to pick the right media to tell their story. There’s nothing better than to be able to put on your resumé that you have written a story that was picked up by CNN.”

Video Conferencing

As campuses strive to create increasingly personalized learning that is marked by collaboration,

video conferencing continues to evolve to enhance classroom, distance and online learning.

For example, the Chaplin School of Hospitality and Tourism Management at Florida International University’s video conferencing system allows students in the kitchen to watch distance-learning instruction and video conference with other groups of students and teachers. It even connects with culinary schools in Ireland and China so participants can share content. The cameras capture all activity throughout the school’s restaurant lab for the video conferences and function as 24/7 surveillance as well.³⁴

At Rialto Unified School District in California, video conferencing empowers students to take virtual field trips to museums and interact with guest lecturers from remote locations. The technology has been so successful that the district has developed elective courses in which students learn how to create content and push it to digital media players so they can teach other students and faculty.³⁵

Lecture Capture

Many of us who went to school in the technological dark ages likely remember beginning math homework and realizing with dismay that those problems seemed much easier when the teacher was doing them at the front of the classroom.

Quick Tips: Conquering the Classroom

- **Only invest in technology that is simple to use.** Faculty and students should gain more benefit out of the tools than the amount of effort they have to put into it.
- **Try to invest in systems that adhere to common and shared open standards** so you can be confident that current and future integrations will be seamless.
- **If your students are zoned out or distracted, ask yourself why.** Make sure your lesson plan is solid and the content is engaging. Technology does not trump Teaching 101 and devices don’t automatically create engaged students.



60% of education leaders report using student response systems in their classrooms.

Source: CDE Research Survey on Classroom Management, 2014

Just as those who were schooled in the practices of manual arithmetic rolled their eyes at students' ability to use calculators, we may be slightly jealous of students who have access to lecture capture. With lecture capture, instructors can record parts of classroom-based activities and students can view those recordings later at their convenience — on a computer, laptop or mobile device.

However, lecture capture is about more than simply capturing a lecture. It can be transformative for students struggling with math and who need to be shown how to work a problem repeatedly. For English Language Learners, or those who want to learn a second language in addition to English, it offers the ability to hear word pronunciations from their instructor over and over.

Newer iterations of lecture capture are increasingly interactive, allowing students to post questions as they view the recording. This post can be seen by both the teacher and other students in the class, which often creates a dialogue and may help answer a question that many students had.

Lecture capture also allows teachers and professors to pull recorded material from others in their field to supplement their own lessons, creating an interconnected approach that is more dynamic and holistic. Frank Fedel, who teaches courses in the Orthotics and Prosthetics program at Eastern Michigan University, says he uses recorded lectures from athletic training, chemistry and anatomy to create greater understanding for his

students. When he wants to remind students about osmosis, for example, he links them to recordings on the subject created by his colleagues.³⁶

Ultimately, lecture capture helps educators better manage the classroom because it frees them from being “on stage” at the front of the room, allowing them to use class time for more personalized, face-to-face instruction with students and to answer specific questions.

Student Response Systems

The student response system (aka “clicker”) is not a new player in classroom management technologies, but like lecture capture, the tool continues to evolve with additional capabilities. Student response systems are popular because they provide faculty with a simple method of instantly determining student understanding of a topic — particularly in a large class — and keep students engaged because they don't know when they will be quizzed.

New features include texting capabilities, which helps facilitate open-ended questions and self-paced learning. Colleges such as Michigan Technological University (MTU) advocate for clickers to be used not as an attendance tool or even solely for multiple choice questions. “Systems should be used to promote interactions between students as they discuss and defend their responses,” notes MTU, and “The instructor should use responses to direct and inform class activities in real time.”³⁷

Monitoring Software

No matter how engaging the lesson or how inventive the lesson plan, students can still be distracted, venture off task or simply be feeling mischievous. For this, monitoring software can be beneficial and put teachers' minds at ease.

"One application that we are definitely going to be integrating comes pre-packaged on our device," says Clark of MUSD. "As a teacher, it's a little nerve-racking to have every student with a device sitting at their desk. This application will allow a teacher to monitor all of those computers and look at any one of those screens at any given time and even lock those screens down if the teacher needs the students' attention to be on them."

Single Sign-On

Each time this writer tries to log on to her credit card account, she's met with a "username/password don't match" error. The process of accessing the password isn't easy. Step One asks three security questions; if you're lucky you can remember them. Step Two requires you to fill in your Social Security number. Step Three requires your full credit card number with the CVC code. If everything has been done right, a temporary code will be sent to your cell phone, at which time you can reset your password — but it can't be anything it has been before in the past six months and it must include a number, a special character, a capital letter and a blood sample (just kidding about the blood sample).

The process can be maddening, even if it is necessary in an era of identity theft and frequent hack attempts. Now imagine a process like this in a classroom of 25 eight-year-olds (100 21-year-olds isn't much better).

As websites, apps and software are integrated into everyday education, password management — or the lack thereof — can be a crucial part of a well-run classroom.

The amount of time lost to recovering passwords can be significant.

Single sign-on technologies, which allow teachers and students to access a variety of software with a single username and password, help simplify this process.

Learning Management Systems and Education Platforms

Learning management systems (LMS) have become imperative as digital content, software and other technology-based tools become staples in education. They also come in many formats — education institutions can use in-house systems or outsource to an LMS provider. Cloud and Web-based systems are increasing in popularity and open source LMSs are also an option. There are free systems that are more of a do-it-yourself version and vendor solutions that offer turn-key implementation, training and ongoing support for faculty and staff.

LMSs help instructors manage, track and deliver courses by centralizing course preparation, educational content and resources. They provide a place for discussion and collaboration and allow instructors to share grades and assessments. LMSs are frequently used in brick-and-mortar classrooms, but are especially helpful in online and virtual environments for organizational and collaborative purposes.

University of Alabama in Huntsville CIO Dee Childs says schools should look for an LMS that allows faculty to share learning objects and other reusable content, enables student-to-student and student-to-faculty collaboration, complies with ADA and includes assessment tools.

LMSs should not be standalone or siloed solutions. An LMS should be integrated with student information systems, assessment systems, other third-party resources and more. Again, like any other investment, think about how implementing an LMS affects all parts of your institution. ■

OVERCOMING THE COMPLEXITY OF CLASSROOM MANAGEMENT

Effective classroom management is essential, particularly as instruction is infused with technology. But classroom management isn't just about the classroom, and teachers aren't the only individuals responsible for its success. It takes a village, as they say, and this village includes IT leaders and staff, administrators, instructional technologists, students, parents and more.

Before instructors and students walk into the classroom or sign-in online, there are thousands of critical steps and choices that need to be made to impact their success. Robust infrastructure, proper planning, thoughtful device selection and a modern model that focuses on personalized and collaborative learning can set the stage for transformative learning. Instructors who continually focus on engaging lesson plans that seamlessly integrate technology use and leverage classroom management technologies can reap even greater rewards.

Classroom management in an age of digital teaching and learning is complex, but by no means impossible to overcome. ■

“If you say, here's a bunch of tablets, make them work — 80 to 90 percent of the time faculty don't use them. They use them to surf the Internet. It wasn't until we realized that you need to connect a project with what you are giving them, that's when they will use it.”

Jim Jorstad, Director of Academic Technologies, University of Wisconsin – La Crosse

“There's a difference between training where you are trying to learn how to use a particular product and professional development where you are integrating that product into instruction and into the classroom.”

Anton Inglese, Chief Information Officer, Batavia Public School District 101

“The classroom of today is more accurately called a 'learning space' and can be a room, part of a room, or may be distributed across the campus and community. The classroom management system and Wi-Fi network must be flexible enough to easily handle these new learning environments.”

Bob Nilsson, Director Vertical Solutions, Extreme Networks

“Security is a combination of people, process and technology. Governance, risk and compliance is a process that helps an organization have ownership of who measures compliance within an organization. This is the framework, but this also works with the appropriate controls for detection, recovery and prevention, as well as user awareness tools.”

Renault Ross, US Security & Privacy Architect, SLED Strategic Program, Symantec

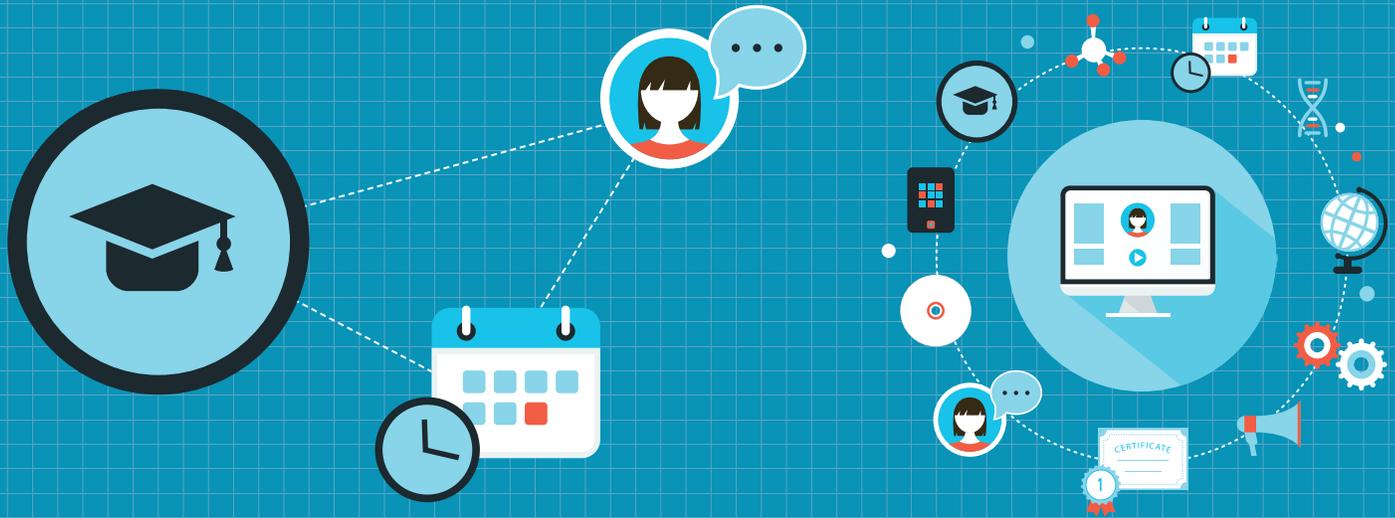
“The schools that are most successful with technology rollouts are the ones that pilot multiple scenarios. They evaluate the pilot and it's a multi-year process where they see the results, they give feedback and they make a more long-term strategic decision.” **Joe Simone**, Director of K-12, CDWG

“Video and unified communication solutions will become the norm for K-12 and higher education communication — not only for distance learning applications, but for everyday communication between student groups, professors, teachers, administrations, and institutions' local and global partnership programs.”

Erin Minich, Director, Education Collaboration Services, AVI-SPL

“While improving student outcomes should be the goal of any technology venture in a school, it is the skill and art of teachers that will ultimately make this happen — not the technology, applications or content in and of themselves. It therefore falls upon us to look at mobile device endeavors from the perspective of teachers, meet them wherever they are in their technology proficiency, and give them simple tools to help move them toward new and exciting teaching models.”

Preston Winn, Director of Education Practices, AirWatch



Teaching for Tomorrow:

Aligning Technology with Curriculum

John Dewey, the American philosopher, psychologist and educational reformer, once said, “If we teach today’s students as we taught yesterday’s, we rob them of tomorrow.”

Today’s classroom looks very different than it did even a few years ago. For example, districts used to select a single operating platform for instruction and administrative functions, but today, districts are using multiple platforms. According to CDW•G’s *Surviving and Thriving in a Multi-platform Universe* report, which surveyed 175 IT professionals in K–12 public school districts, more than 90 percent of K–12 IT professionals report that supporting multiple platforms is a priority for their district.

In fact, the average district is already supporting three platforms for instruction. Add in interactive whiteboards, projectors, mobile devices and BYOD, and suddenly a district’s challenge switches from getting technology into the hands of its students to ensuring that technology is also enhancing education.

To that end, teachers need help aligning technology and the curriculum, which means understanding the devices and available resources. Eric Patnoudes, CDW•G K–12 specialist, has seen both sides of the technology conversation. Having worked as an instructional technologist and special education teacher, Patnoudes recognizes the potential technology can have on a classroom when educators take maximum advantage of it.

“The Internet is filled with educational apps, websites and tools, but that doesn’t always mean the results are easy to incorporate,”

said Patnoudes. “A slight change of perspective can make a significant difference when integrating educational technology into the classroom.” As such, he recommends:

- Identifying the curriculum goals and pedagogical approach. What are you going to teach, and how are you going to teach it?
- Choosing a set of technology skills. For example, the International Society for Technology in Education’s (ISTE) Standards for Students (formerly NETS-S) provides “standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world.” Pick one or two standards to focus on according to their relevance to the lesson being taught.
- Finding the right technology to facilitate the learning activity. Once the previous decisions have been made, the seemingly overwhelming list of tools or apps can easily be filtered, and the choice becomes much simpler.
- Putting it into practice. Don’t be afraid to try it out, gauge your students, ask for feedback and move forward accordingly. Ultimately, their experience determines the success of a resource.

As the parameters of classroom management change, the primary goal remains the same: ensuring that lessons help engage, inspire and prepare students. CDW•G offers a wide range of resources to help schools bring technology to their classrooms and manage devices, networks and security.



SECURING EDUCATION DATA AND APPLICATIONS

The current education environment looks nothing like the classroom of just 10 years ago. As more technologies come onto campus and are integrated into classrooms, education institutions need to be prepared for anything — including a data breach.

Shutting down operations is not an option for most schools. Though some education institutions have developed a plan to ensure specific data and apps are backed up, this approach is often siloed, which leaves a significant portion of data vulnerable.

To ensure that education institutions are prepared for any data breach or disaster, Symantec provides IT disaster recovery and continuity of operations planning (COOP).

Safeguarding Mobile Applications

Mobile devices and apps can enhance the learning environment, however, without the proper security measures in place, they can put sensitive data at risk. To help safeguard mobile devices and applications, Symantec offers:

- Integrated mobile threat protection
- Security and policy application wrapping
- Secure email and Web
- Integrated mobile device management
- Authentication and single sign-on app security policies
- Minimized distractions due to unauthorized downloads or malware
- Compliance with education security policies

To learn more, visit: www.symantec.com/app-centertssolutions/solutions/?parent=it-business-continuity

Ensuring Availability of Mission-Critical Applications

Ensuring availability of applications that are critical to daily operations and distribution of digital curriculum provides educators with an opportunity to optimize the learning experience, both in and outside the classroom. To ensure educators and students can access critical applications anytime, anywhere, Symantec offers:

- Data backup and restoration
- Flexible online storage options
- Metro and local high availability
- Data replication
- Automated disaster recovery (whether natural or human error)
- Inventory applications and information

To learn more, visit: www.symantec.com/productssolutions/solutions/?parent=it-business-continuity



Unified Communication and Collaboration for the Connected Classroom

Education institutions often integrate new collaborative communication technologies to enhance the teaching and learning experience, and remain competitive in efforts to attract the best students, faculty and leadership. But many of the technology solutions deployed address only one of the four key education enterprise areas (see sidebar). Unified Communication and Collaboration (UCC) solutions, however, serve all four education enterprise areas.

Key Education Enterprise Areas

- Teaching & Learning
- Home/School Connections
- Administrative Operations
- Community Partnerships & Engagement

With the right UCC solution in place, education institutions can unite previously incompatible audio, video and Web technologies to maximize and expand upon existing video, voice and Web investments. This union improves communication among faculty, students and administrators, and reduces the IT staff's need to manage multiple, disparate communication technologies.

AVI-SPL's UCC offerings not only provide benefits for bringing together disparate communication technologies, they also support next-generation learning models, digital pedagogies and can assist with creating active learning environments and increasing student engagement. UCC also plays an important role for distance learning and local and global communication initiatives through browser accessible video, audio and content sharing.

Because AVI-SPL understands the needs of the education enterprise, its UCC solutions are available as on-premises, hosted or as-a-service.



- Control and prioritize network access to educational and classroom applications
- Deliver high-density, high availability wired/wireless services transparently to faculty, staff and students
- Provide secure guest access to authorized users with a reduced set of permissions and access
- Protect student confidentiality and safeguard institutional data
- Provide a simplified management tool to ease the burden on your IT staff - one system for both wired and wireless network management

Enabling Personalized Learning with Extreme Networks Infrastructure

<p>iIdentifi™ Wireless - 802.11ac Wi-Fi Delivering Unmatched Scale, Density, and Performance for Education</p>	<p>Simple, scalable and intelligent switching and routing products come in a variety of forms to fit every need.</p>	<p>Management and control to achieve agility through automation. Delivering advanced analytics for monitoring and control of applications and Internet sites.</p>

Online Testing - With the flexible network control offered by Extreme Networks, classroom networking can be set up to allow secure student access to the test servers for online exams but disallow general Internet access. In the same classroom, the teacher's device can be granted access to all district resources as well as the Internet. Visit our online testing resource center to see our webinar, *Preparing Your District Technology*, test your district's speed to the Internet, and to learn more about getting ready for PARCC and Smarter Balanced.

BYOD and 1-1 Computing - As school districts move to 1:1 or BYOD computing, they need the ability to deliver networked services to large numbers of computers and tablets without slowing down the network. With Extreme Networks, school districts can accommodate and manage both district-owned and student-owned devices into these 1:1 computing programs.

Google Chromebooks for K-12 - Chromebooks are taking on a growing role in K-12 education. Read our case studies about school districts deploying Chromebooks with Extreme Networks

- Elmbrook School District worked with Extreme Networks to implement 1:1 Google Chromebook initiative.
- Kimberly Area School District - Incorporating Chromebooks in the classroom to facilitate collaboration and better teaching practices.
- Winneconne Community School District - Successful BYOD and 1:1 Chromebook Initiative puts devices in the hands of students.
- Apache Junction School District - Supporting a 1:1 Chromebook Initiative to facilitate PARCC online testing.



The Classroom is Changing— Empowering Your Teachers to Guide Mobile Learning



It's impossible to ignore the fact that traditional teaching methods are changing at the same time the classroom is evolving to incorporate mobile technologies and other tools. While transformative classroom technologies and teaching models may be exciting, they can also be overwhelming for teachers who worry students will be distracted by devices rather than learn from them.

Without overseeing each student's activity during every moment of class time, it can be difficult to tell if students are on task, engaged and accessing relevant content. AirWatch Teacher Tools enables K–12 teachers to guide mobile learning by managing student devices, apps and content.

Teacher Tools includes two apps — AirWatch Teach for the instructor and AirWatch Learn for students. AirWatch Teacher Tools enables schools to easily integrate mobile learning into the classroom, while empowering teachers to improve instruction, manage students' online behavior and personalize learning.

AirWatch Teacher Tools helps teachers transition quickly and easily between whole class instruction and small group collaboration, peer-to-peer learning or individual student work, ensuring teachers have control of the classroom and student

attention. Teachers can lock all devices, prevent students from exiting a particular app and ensure that students are on task while conducting small group or personalized instruction.



AirWatch Teach enables instructors to:

- ▶ Create classes and distribute content
- ▶ View student device information, such as battery life
- ▶ Lock all students or small groups into approved apps or shared content
- ▶ Disable student devices to command attention at the front of the room
- ▶ Facilitate new teaching models



AirWatch Learn allows students to:

- ▶ Customize images and backgrounds
- ▶ View class material and shared content
- ▶ Collaborate with teachers and students

AirWatch is committed to supporting teachers as mobile devices and new teaching models emerge worldwide. Providing instructors with basic management of classroom devices, applications and content ensures they are available to customize the learning experience for each student.



AirWatch by VMware is the leader in enterprise mobility management, with more than 12,000 global customers. The AirWatch platform includes industry-leading mobile device, email, application, content, and browser management solutions. Acquired by VMware in February 2014, AirWatch is based in Atlanta and can be found online at www.air-watch.com.

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Acknowledgements:

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www.centerdigitaled.com

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