CDW·G **PEOPLE WHO GET IT**

A MODERN LEARNING ENVIRONMENT

Three key aspects — technology, flexible furniture and audiovisual tools — help propel classrooms and students into the future.

EXECUTIVE SUMMARY

While most of the public conversation about K–12 education centers on topics such as test scores, learning standards and teacher quality and retention, the actual environment in which students learn is often neglected. And yet, the design of classroom spaces and other learning areas throughout schools can have an outsized impact on student outcomes ranging from academic growth and engagement to improved health and classroom behavior.

Modern learning environments seamlessly integrate technology into spaces that are designed around teaching and learning, giving instructors and students the tools they need to succeed in a physical setting that promotes collaboration and supports multiple learning styles. While connected devices are an important part of modern learning environments, audiovisual equipment and even classroom furniture are also essential to creating spaces that are conducive to teaching that focuses on future-ready skills.

A modern learning environment requires more than just investments in physical assets. Although the concept of the modern learning environment is still emerging, a consensus is already forming around best practices, which include a commitment to student-centered learning and professional development for educators.

What Is a Modern Learning Environment?

Education has shifted dramatically in recent decades — from an emphasis on fact memorization through "drill and kill" and "sage on the stage" teaching styles to a focus on higher-order thinking and future-ready skills such as critical thinking and problem solving. Along the way, schools have raced to incorporate technology, first through stand-alone computer labs, and then through one-to-one device initiatives and massive networking upgrades. But in many cases, the K–12 classroom itself has remained stubbornly static, with students sitting in rows of desks and a teacher delivering instruction at a whiteboard or projector screen at the front of the room.

The concept of the modern learning environment is beginning to change with school districts attempting to align their physical spaces with contemporary pedagogical philosophy. In a modern learning environment, flexible classroom spaces organically integrate technology, helping teachers to better engage students and facilitate the mix of independent, small-group and whole-class learning that is now viewed as essential to student success.

Typically, a modern learning environment incorporates three key elements: connected devices (such as notebooks, tablets or even smartphones); audiovisual tools (including projectors and touch-screen displays); and purposeful furniture that allows students to learn in different ways at different times (such as standing desks, collaborative workstations and connected seating).

While the concept of outfitting classrooms with connected devices is certainly not new, the reality is that student devices are often not put to their highest use, precisely because they are sometimes seen as an afterthought — or an "add-on" — rather than as tools that are essential to teaching and learning. Most school buildings predate the tablets and laptops that students are using by several decades, and although school leaders have done their best to incorporate technology into instruction, they have been aiming at a moving target. For a time, many schools relied on laptop carts, but this solution was cumbersome, with teachers unsure of when they would have access to the technology, and whether the computers would be powered up when they needed them. Some districts have found success with bring-your-own-device policies, but others have found it nearly impossible to manage a computing environment where every student has a different device. Even in districts that have invested in one-to-one programs, leaders have sometimes been disappointed by lackluster adoption, found it difficult to continue funding the programs over time or failed to make the networking upgrades necessary to ensure a high level of performance. By contrast, modern learning environments are designed with the assumption that students will have constant access to connectivity — and are supported by the back-end technology and teacher training necessary to ensure that student devices play a central role in the classroom.

Similarly, audiovisual solutions in a modern learning environment directly support student learning and engagement. Depending on grade level and instructional goals, these solutions may include interactive whiteboards, document cameras, multitouch digital displays, projectors and even microphone lanyards for soft-spoken teachers in larger classrooms. The key is not to implement any single audiovisual tool with a one-size-fits-all approach, but rather to outfit classrooms with the solutions that will best help teachers reach their students.

Classrooms of the (Near) Future

In their K–12 2017 Horizon report, the New Media Consortium and the Consortium for School Networking predict that these technologies will have a significant impact on classrooms within the next five years:

ONE YEAR OR LESS

Makerspaces — These spaces, where students use tools such as 3D printers, laser cutters and animation software, are emerging as a vehicle to expose students to technical disciplines and encourage creative and entrepreneurial thinking.

Robotics — Educators are leveraging robotics to promote critical and computational thinking, and to provide hands-on learning in STEM subjects.

TWO TO THREE YEARS

Analytics — As schools work with and interpret Big Data, they will develop improved ways to make targeted decisions that will enhance student learning and assist at-risk students.

Virtual Reality — VR headsets and applications will help educators transport students to distant geographical locations and give them up-close views of scientific phenomena ranging from hurricanes to the circulatory system.

FOUR TO FIVE YEARS

Artificial Intelligence — AI has the potential to provide insights into teaching and learning, and to relieve teachers of tedious tasks.

Internet of Things — IoT technologies are already helping schools operate their facilities more efficiently. Over time, they will also help educators better understand how certain actions can impact student achievement.

As with student devices, some districts in the past have made large investments in costly tools such as interactive whiteboards without providing teachers with the professional development necessary to ensure adoption.

Finally, while classroom furniture may seem like a decidedly low-tech solution, it can be a high-impact tool that literally puts students in the right learning posture. A modern learning environment requires a flexible and agile physical setup that will accommodate both independent and group work, and one where students can learn in ways that make them feel comfortable and help them focus. Perhaps the simplest example of this is the standing desk, which gives students a break from sitting all day, heightens alertness and even helps burn calories. Other types of convertible furniture quickly transform from individual workstations into group gathering spaces. In the business world, adults move around throughout their workdays, going from ergonomic chairs in their offices to conference tables to quiet corners, depending on the task at hand. It's important that kids be allowed to do the same. Many furniture options now come equipped with USB or three-prong charging ports, helping students to keep their devices powered up throughout the day.

## The Benefits of Modern Classroom Design

Educators say that modern learning environments have a wide variety of benefits, including increased student engagement and motivation, stronger relationships with peers and teachers, enhanced collaboration and an increased sense among students that they have ownership over their own learning. And, although the modern learning environment is a relatively new concept, research studies and surveys show that classroom design

45%

The increase in academic engagement that can result from improvements to classroom layout such as creating space for independent work or making a clear pathway to access school supplies[1]

can have a significant impact on student learning and health outcomes (see sidebar, "Measurable Benefits of the Modern Learning Environment").

Still, the modern learning environment is perhaps best seen as a wraparound support for schools and districts that have already adopted and begun to implement student-centered teaching philosophies. While some of the benefits of the modern learning environment may manifest themselves regardless of the context in which they are implemented, these benefits will be magnified many times over when teachers are poised to take advantage of their new physical spaces. Flexible furniture is unlikely to do much good, for example, in a classroom where the teacher insists that students stay seated in rows. And state-of-the-art audiovisual tools and one-to-one student devices won't make much difference in a classroom where the teacher's preferred method of instruction is to read aloud from decades-old lecture notes.

With its focus on layout and design, the modern learning environment is, in a sense, a rebuttal to the idea that technology alone can solve problems and improve learning outcomes in K–12 classrooms. In a recent article, the Brookings Institution stated that the idea that technology itself can improve student outcomes "must die," noting that previous generations have variously predicted that the inventions of the motion picture, the radio and the television would spell the end of traditional schooling. However, Brookings also said that technology, when wielded by well-trained teachers who help students use devices to discover and create, can "transform the learning experience." That is the promise of the modern learning environment.

Modern classroom design may be especially beneficial for schools and districts that are already experimenting with or
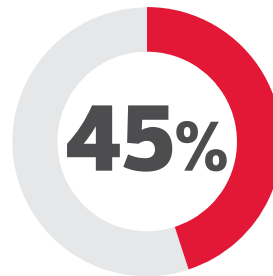
Getting Teachers on Board with IT

No matter what investments school districts make to create a modern learning environment, they likely won't have much impact if teachers don't utilize them. According to a 2017 study by Blackboard and Project Tomorrow, a majority of school principals (51 percent) and technology leaders (67 percent) say that the greatest challenge they face in implementing digital learning or expanding technology use is motivating teachers to change their traditional instructional practices. And, while 71 percent of district administrators say that the effective use of technology is "extremely important" for student success, only 43 percent of classroom teachers say the same.

To change teacher attitudes, school and district leaders must show instructors how technology can benefit their practice and provide them with resources that set them up for success. The Blackboard and Project Tomorrow study identifies five essential elements that teachers need to effectively and efficiently integrate digital content, tools and resources into daily instruction in their classroom: planning time to work with colleagues, a classroom set of devices for student use, readily available tech support, professional development and reliable internet.

implementing one of the newer technology-enhanced digital learning models that have made waves in recent years. Blended learning, which combines online and traditional classroom instruction and allows students to learn at their own pace, has been shown in some cases to improve math and reading scores and boost graduation rates. In personalized learning models, teachers tailor instruction and assessments to each student's unique needs and preferences with the help of digital resources. Flipped learning does just what the name suggests, "flipping" the learning model so that students initially learn content at home (often via online videos either created or found by the teacher), and then apply their learning in the classroom with the help of their peers and instructors. Each of these models relies on student access to devices, constant connectivity and a classroom design that supports individual and small-group learning.

Unsurprisingly, research shows that teachers in blended learning classroom environments see greater positive impacts from technology than those using more traditional teaching methods — perhaps suggesting that teachers already using digital learning models will see the greatest success from modern learning environment improvements. According to a 2017 study by Blackboard and Project Tomorrow, 57 percent of teachers in blended learning environments say that technology leads students to collaborate more with their peers, 50 percent say that tech helps students apply knowledge to real-world problems and 48 percent say that digital tools help students take greater ownership over their learning. Each of these numbers is at least 15 percentage points higher for teachers in blended learning environments than those in traditional classrooms.

While IT directors may be able to initially convince stakeholders such as superintendents or school boards that the modern learning environment represents a panacea that will automatically boost test scores and ensure that students love school, this will both result in disappointment and waste much of the potential of modern classroom design. Rather than being viewed as a standalone miracle worker, the modern learning environment should be seen as one part of a comprehensive plan that includes support for teachers, robust back-end IT resources and a commitment to student-centered teaching that emphasizes 21st-century skills.

A Major Transformation

School districts obviously have the greatest freedom to transform classroom spaces when new school buildings are being designed and built. During new construction projects or major renovations, districts aren't limited by existing classroom footprints or load-bearing walls, but only by their imaginations (and their budgets). In recent years, districts have frequently used new school construction as an opportunity to improve the energy performance of their buildings, pursue green building certifications such as Leadership in Energy and Environmental Design (LEED), upgrade networking and back-end IT infrastructure, and improve factors such as daylight, airflow and acoustics. District leaders should also take this opportunity to seriously rethink the design of both classrooms and common spaces, as decisions made today will help inform student instruction for decades.

In districts where major construction projects are not on the horizon, leaders have another opportunity: the ability to experiment with learning environment designs a little at a time, allowing teachers, students and district leaders to come to a consensus on what works best for their needs. Often, the effects of the modern learning environment are felt first in common areas such as libraries and media centers. The advent

Measurable Benefits of the Modern Learning Environment

The advantages of modern classroom design aren't merely theoretical. Research shows that students respond positively when they learn in environments tailored to their needs.

70%
The portion of students who reported better grades, better attendance or improved creativity in newly designed active learning environments[1]

5.24
The difference in body mass index (BMI) percentile between students who use standing desks for two consecutive years and those who use traditional desks[2]

17%
The increase in calorie expenditure for students who use standing desks, compared with those who use traditional desks[3]

70%
The portion of parents who say that standing in the classroom has a positive impact on their child's behavior[3]

Sources: [1]Mark Fehlandt, Hamline University, "Flexible Classroom Design and Its Effects on Student-Centered Teaching And Learning," August 2017; [2]American Journal of Public Health, "Stand-Biased Versus Seated Classrooms and Childhood Obesity: A Randomized Experiment in Texas," October 2016; [3]Pediatrics, "Classroom Standing Desks and Sedentary Behavior: A Systematic Review," January 2016

of digital resources and e-books has meant that many schools are reducing their inventory of physical books, freeing up square footage where school leaders can pilot new furniture, devices and audiovisual tools.

Over time, school leaders will want to extend these features into individual classrooms, so that technology and collaboration become embedded into the school day, as opposed to being special features reserved for visits to the school library. But even then, schools might choose to start out small, implementing new design features in the classrooms of a select few teachers. Often, these will be staffers who have agreed to aggressively integrate the new tools into their curriculum and attend outside training sessions to learn how to maximize the impact of their new resources. This early adopter model, in which other teachers become excited by — and, at times, even jealous of — their colleagues' new spaces and digital tools, often proves more effective at encouraging adoption of IT initiatives than a mandate from above.

Because the modern learning environment represents such a massive transformation, it is important for leadership teams to ask probing questions at every stage of the process. For example, if it is determined that students should all have access to connected devices, districts must then decide whether BYOD, one-to-one or another model will work best and why. Other important device-related questions that leadership teams should ask include:

- How will student devices be charged?
- Will there be times when students aren't allowed to use their devices? How will this policy be enforced?
- What apps will students need to use their devices effectively? Are there funds budgeted for these apps?
- In one-to-one environments, will students be permitted to take devices home with them? Will they be expected to use them to complete homework? How will the district accommodate students who lack connectivity at home?
- How will devices be monitored and managed?
- Is the district's IT network robust enough to accommodate the traffic resulting from students in every classroom attempting to access online resources at once?
- Do existing wireless resources support the density that will result from 30 students in a single classroom attempting to connect to a wireless access point?

Similar questions should be asked about investments in audiovisual tools and flexible furniture. For example, buying interactive whiteboards or multitouch digital displays is a potentially transformative investment, but it is also a costly one. Before authorizing such a purchase, district leaders should ensure that all academic departments across all grade levels have had a chance to provide input on how such a tool would elevate instruction. If a district's high school English and history teachers aren't sure how they would use these displays, for example — or if their plans involve merely replicating pen-and-

paper processes in a digital format — then perhaps the initiative should be reconsidered. Flexible furniture is a more universally intuitive solution, but district leaders should know before making an investment what sorts of learning activities each configuration will support.

Asking these questions before attempting to make big changes can help the modern learning environment truly transform learning, rather than becoming an expensive initiative that goes half-fulfilled.
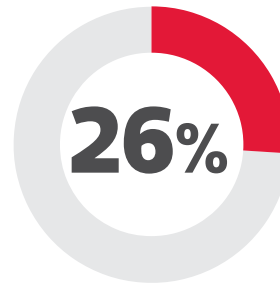
Best Practices

In CDW's modern learning environment engagements with numerous school districts across the country, the following best practices have emerged:

Plan Across Silos — The decision-making process leading up to the implementation of the modern learning environment should include not just district leadership and IT teams, but also school leadership teams, teachers, the custodial teams who will care for and maintain the new spaces and students and parents.

Eliminate the Front of the Classroom — One quick way to tell whether modern learning environment improvements will truly transform teaching and learning is to look at the classroom layout. Even when students are sitting in flexible furniture and armed with connected devices, not much is likely to change if they're all still aimed at the front of the room. Classroom layout can have a huge impact on instruction by simply changing traffic patterns and encouraging teachers to circulate through the room, rather than standing at the front to deliver instruction.

Make Every Space a Learning Space — By ensuring that common spaces such as hallways, auditoriums and media centers are learning spaces, schools give teachers new ways to encourage collaboration among students, who may feel more relaxed and comfortable in open areas.

Repurpose Existing Items — Redesigning learning spaces doesn't have to mean scrapping all of the furniture and technology already in place in a district. If a district finds that interactive whiteboards in its high school classrooms aren't being used, for example, these displays might be pushed down into classrooms in the lower grades.

Support and Manage Technology — Class time is limited, and when technology doesn't work or teachers and students can't connect their devices because of network congestion, they will often quickly give up and revert to traditional methods. Only when access to technology is consistent and predictable will teachers be willing to incorporate digital tools into their planning. Many school districts fund essential networking upgrades through the federal Schools and Libraries Program of the Universal Service Fund, more commonly referred to as E-rate. Often, vendors work with districts to identify products that are eligible for E-rate funding. It's also important to equip devices with collaboration and productivity tools such as Office 365 or G Suite for Education.

Finally, device management is also crucial, as districts must

26%

The increase in math and reading test scores for students who are exposed to more daylight in the classroom than those with less exposure to light[2]

be able to monitor the devices on their network and keep track of the devices they own. Deploying security solutions that protect student endpoints and the IT network are necessary to protect student data and prevent cyberattacks.

Differentiate Spaces — Just as two students might need different interventions to help them succeed, not every classroom is alike. A STEM-focused classroom might require more robust technology and different furniture from an English or history classroom.

Provide Excellent Professional Development — Teacher buy-in and adoption is perhaps the largest determining factor in the success of a modern learning environment, and effective professional development is key to getting teachers on board. According to the American Federation of Teachers, 71 percent of educators say they face job-related stress due to "the adoption of new initiatives without proper professional development." Rather than merely offering an introductory session on new technologies, administrators should incorporate modern learning environment improvements into their professional development on an ongoing basis.

Be Willing to Fail at First — No matter how carefully district leaders plan a modern learning environment initiative, much of the learning will inevitably occur through trial and error — the same way students often must arrive at several wrong answers before discovering the correct one. While district leaders should set themselves up for success with the best practices mentioned above, they should also encourage their teachers to experiment and take chances with their new tools. Even the best modern learning environment implementations won't be without missteps. True transformations rarely are.

CDW: A Retail Partner that Gets IT

With decades of experience working with educational institutions across the country, CDW's solution architects understand the specific IT challenges facing K–12 school districts. Especially for districts with limited IT staff, CDW can provide extra sets of eyes, ears and hands to help schools design and implement tech solutions that promote student learning.

Networking — Much of today's teaching and learning happens online, and many school districts rely on CDW's solution architects to help them ensure optimal performance and uptime for their IT networks.

One-to-One — CDW's partnerships with leading vendors give school districts reassurance that the device type they ultimately choose — whether notebook, tablet or convertible — will fit with their vision for classroom transformation.

Cloud — Cloud client executives at CDW can help school districts navigate the ever-changing public cloud environment, and work with education IT professionals to decide which workloads to place in the cloud and which to run in-house.

Mobility — From mobile devices to wireless networking to mobility management, CDW's solution architects meet school districts' end-to-end mobility needs.

DR and Continuity of Operations — Many school districts put off disaster recovery and continuity of operations planning until after disaster strikes. With DR and Continuity of Operations engagements from CDW, IT leaders can prepare their districts for worst-case scenarios.

The CDW Approach

ASSESS
Evaluate mission-critical objectives, technology environments and processes; identify opportunities for performance improvements and cost savings.

DESIGN
Recommend relevant technologies and services, document technical architecture, deployment plans, "measures of success," budgets and timelines.

MANAGE
Proactively monitor systems to ensure technology is running as intended and provide support when and how you need it.

DEPLOY
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