

Reinventing Classrooms to Support Better Learning

How K-12 leaders can create dynamic, purpose-driven learning spaces that lead to more effective instruction.



The traditional classroom design that many educators experienced when they were in school, with rows of desks facing the front of the room, was sufficient when lecturing was the primary method of instruction. But over the last few decades, the nature of teaching and learning has changed dramatically—and the design of classrooms is evolving to reflect this shift.

In most K-12 schools today, students still receive some whole-group instruction from their teacher, and sometimes from one of their peers. But they also spend time working together in small groups to solve challenges or complete projects. And they often work independently as well, such as by using adaptive online software that tailors instruction to meet their individual needs.

To facilitate these various modes of instruction, learning spaces will need to look very different. This white paper will explore how K-12 classrooms can be designed so they support multiple types of learning effectively and efficiently.

How Instruction Is Changing

In a majority of K-12 schools, instruction is moving away from a teacher-centered approach, with the teacher standing at the front of the room and delivering information, and toward more of a student-centered approach in which students take ownership of their learning and the teacher acts as a guide or facilitator.

There are many factors responsible for this shift. For instance, as classrooms become increasingly diverse—with educators responsible for managing the learning of students with a wide range of abilities, including those who have special needs or limited English proficiency—teachers need an easy way to meet students where they are on the learning continuum. This can't be done just by teaching to everyone at once. Arranging students in small, flexible groups based on their ability, and allowing students to work independently at their own pace, are two strategies that have proven to be effective for differentiating instruction.

In addition, a growing body of research suggests that students learn more effectively when they take an active role in their education, rather than sitting passively and listening to information. For example, a 2014 study published by the National Academy of Sciences compared the performance of students in undergraduate math and science classes that used traditional lecturing and active learning. The study found that average scores improved by about 6% in active learning classes—and that students in classes with traditional lectures were 1.5 times more likely to fail.

Active learning might involve activities such as student-led inquiry, class discussion, creating original works, collaborating with peers, or project-based learning. It's more engaging than just sitting and taking notes while a teacher is talking, and it helps foster important 21st-century skills that employers are looking for. When students are actively engaged in their learning, they are thinking, creating, sharing, communicating, and taking their learning to a deeper level.

"Active learning classrooms are important because they enhance the learning environment," says Jami Milner, a former classroom teacher who is now an Account Manager for NEC Display Solutions. "In an active learning classroom, the communication is no longer flowing in one direction. Students are interacting with content and with each other more effectively, which leads to better learning—and technology facilitates that."



The Relationship Between Classroom Design and Pedagogy

The way a classroom is designed can have a big influence on the teaching and learning that occur there, because different kinds of learning activities are best supported by different arrangements of the physical space. In reinventing classrooms to support better, more efficient learning, K-12 leaders should carefully consider how these spaces will be used and design spaces that best suit their learning goals.

The 19th century American architect Louis Sullivan coined the phrase “form follows function,” meaning the design of a space should relate to its intended purpose—and this is true of classrooms as well. A classroom with rows of desks facing the front of the room creates a teacher-centric learning space that suggests students are expected to sit quietly and listen as the teacher talks. On the other hand, a classroom with students seated facing each other in small groups encourages more active, collaborative, and student-centered learning—and a classroom that includes individual computers for students to work at is designed to support independent study. Because there will be times when teachers will want to use each of these pedagogical approaches in their classrooms, agility is critical when designing learning spaces. In other words, it's important to have a space that can effectively support all three of these types of learning: whole class instruction, small group collaboration, and independent study.

“A group of learners should be able to move from listening to one speaker ... to working in groups ... to working independently,” writes former Indiana University education professor Nancy Van Note Chism in a publication called *Learning Spaces*, from the higher-education technology group EDUCAUSE.

What's more, this transition should be seamless, so that it does not disrupt learning or take any valuable time away from instruction.

There are two ways that K-12 leaders can accomplish this goal. One is to create separate zones (or learning centers) within classrooms for each type of instruction. In this type of classroom setup, the teacher might be instructing some students directly from the front of the room. Other students might be arranged in small groups off to the side, working together on a project or challenge. Still others might be sitting at computers in the back of the room, engaged in independent study. All of this instruction is happening simultaneously.



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The other way K-12 leaders can accomplish this goal is to equip classrooms with furniture that can be rearranged quickly to support various kinds of instruction. Several classroom furniture manufacturers make desks and tables that easily can be placed into flexible groupings of multiple sizes to accommodate different learning modalities.

Technology's Role in Supporting Agile Learning Spaces

However students are engaged in learning, interactive display technology is crucial to instruction. As classrooms evolve to support multiple learning modalities, having only a single large-screen display at the front of the room is no longer adequate. This is why many schools now supplement the large screen at the front of each classroom with smaller interactive displays that can be used for group collaboration—as well as desktop displays that can be used for independent learning.

Here is how display technology might effectively support each type of learning.

Whole class instruction

When educators are teaching to the entire class, it's imperative that students can see the material from wherever they are, including the back of the room. A display size of at least 85 - 100 inches is optimal. Although prices are falling on flat-panel displays, “an interactive projector is still the most cost-effective solution to get an image of that size,” says Ryan Pitterle, Product Manager for Sharp NEC Display Solutions.

An interactive projector can make any surface interactive, including a classroom wall or traditional whiteboard. This allows for multiple uses of the space, which is not the case with an interactive whiteboard.

Small group collaboration

Large format displays that are 55 to 70 inches in size are perfect for giving students who are working in small groups an interactive, collaborative workspace. A group of three to six students can be gathered around a large format display in order to share their device's screen with other group members. They can interact with this shared content directly on the flat-panel display itself using a touch-screen overlay, and then capture, save, and distribute their work to all team members or send it to the teacher.

If a classroom contains a permanent space intended for small group collaboration, these displays can be mounted on a stand that is affixed to each group workspace, or “huddle space.” If movable furniture is used to create temporary collaboration spaces, then the displays could be moved around the room on mobile media carts as needed. This is what Florida's Duvall County Public Schools has done with NEC V Series displays that are equipped with touch overlays to encourage interactive, collaborative learning.

Independent learning

Schools that can't afford to give every student a digital device, or that don't want the management hassles that come with a 1:1 computing program, can set up computer workstations with desktop displays for students to use when they are working on lessons independently at their own pace. A cost-effective way to do this is to use thin or zero client computers that connect to a server and display content from the server or from the Internet without having to store or run software locally.



Dynamic, Purpose-Driven Classrooms

In reinventing classrooms to support more efficient learning, K-12 leaders are limited only by their imagination. The key takeaway is to design learning spaces with the end purpose in mind, thinking of how the space will be used and how this, in turn, shapes the design.

Creating learning spaces that are flexible enough to support multiple methods of learning—including whole group instruction, small group collaboration, and independent study—is essential. Consider how technology fits in with the design as well, and how interactive display technology can support all types of learning more effectively.

Sharp/NEC offers display solutions that can meet all of these various needs, at multiple price points to accommodate all types of school budgets.

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