hord | coplan | macht

DESIGNING FOR SUCCESS IN HIGHER EDUCATION



THE IMPACT OF TECHNOLOGY IN HIGHER ED CLASSROOMS

Technology plays a critical role in our higher education environments. As IT systems continue to advance and evolve rapidly, many colleges and universities are seeking guidance on how to redesign their spaces to support a wide range of learning styles, teaching methodologies and infuse the latest technology.

Today's students demand flexible and personalized learning experiences available 24/7/365, necessitating a shift in both the pedagogical and technological aspects of the classroom. In this article, we'll explore a few key considerations to address technology's evolving role.

01 PEDAGOGY

02 TECHNOLOGY



The classrooms at Radford University's Center for Adaptive Innovation and Creativity in Radford, Virginia were designed to be flexible, allowing faculty to arrange the room as needed to allow for team and project-based learning.

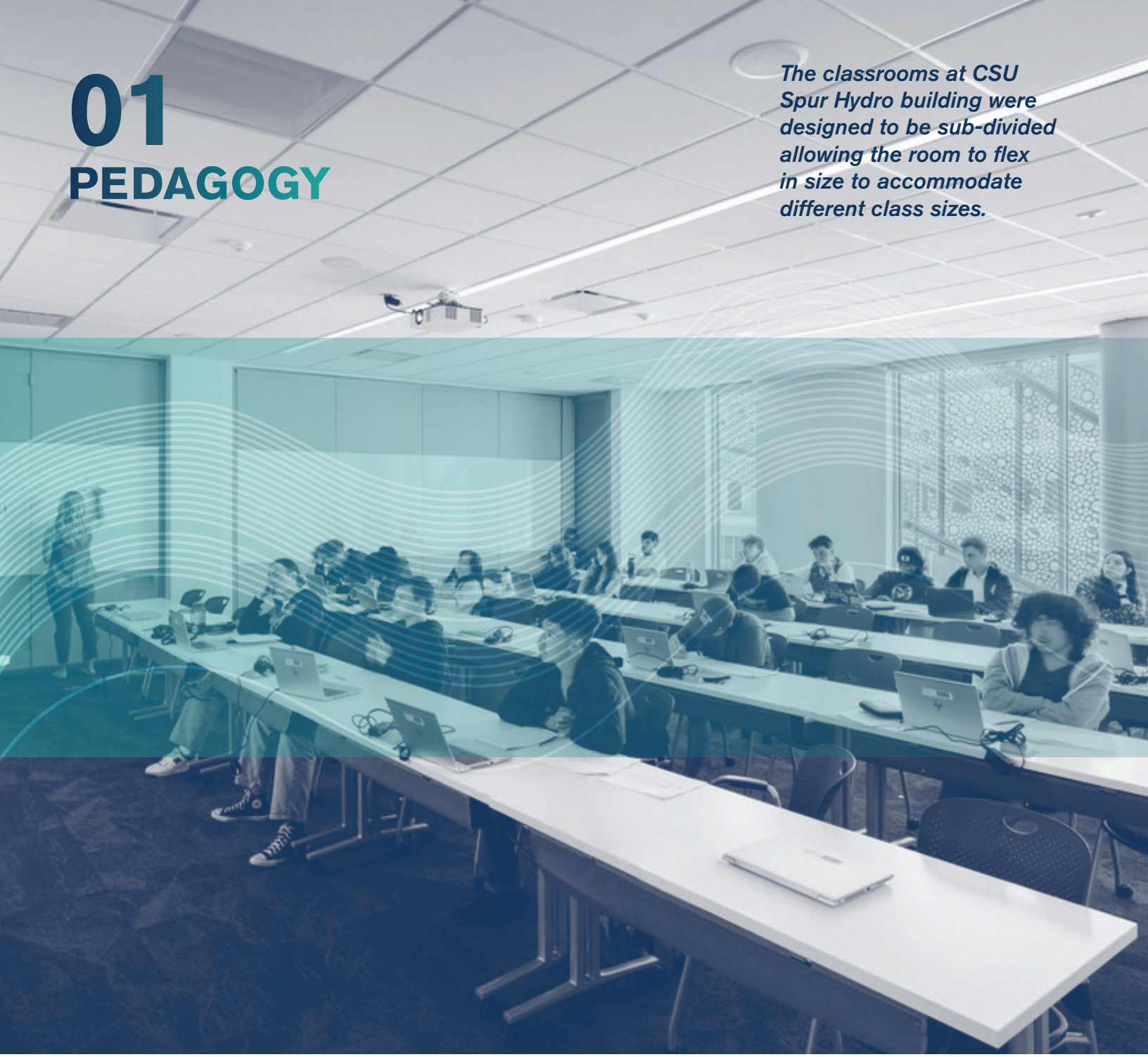
03
AV EQUIPMENT

04
ARTIFICIAL INTELLIGENCE

05
LECTURE CAPTURE



01 PEDAGOGY



The classrooms at CSU Spur Hydro building were designed to be sub-divided allowing the room to flex in size to accommodate different class sizes.

There are a diverse range of delivery modes present in today's classroom environment encompassing online, in-person, hybrid synchronous, hybrid asynchronous, and HyFlex formats. Each mode accommodates different learning preferences and circumstances, with distinct spatial needs.
At the same time, different modalities of teaching, such as lecture-style, active learning, project-based learning, experiential learning, lab-based activities, and simulation experiences, are being employed to enhance student engagement and understanding. These different modalities require different systems and space requirements.

Despite evolving pedagogies, most still rely on a centralized presentation area to focus student attention. Nathan Hicks, CTS-D, Associate Vice President at Salas O'Brien, offers a practical rule of thumb for screen sizing and room depth to ensure ideal viewing conditions. He recommends that the maximum height of a presentation screen should be calculated by taking the ceiling height and



At Colorado State University's Pueblo campus the renovated Technology classrooms were updated to promote project-based learning. Butcher block tables, overhead power, and perimeter mounted ventilation allows the room to support material testing in this Construction Management classroom.

subtracting four feet —this keeps the image high enough to avoid blocked sight lines. The optimal viewing distance to the furthest seat should be six times the screen height. For example, a 10-foot ceiling allows for a six-foot screen and a 36-foot room depth. Institutions should consider this guideline when designing or renovating classrooms. In most cases, it results in the long wall of a rectangular room serving as the presentation wall.

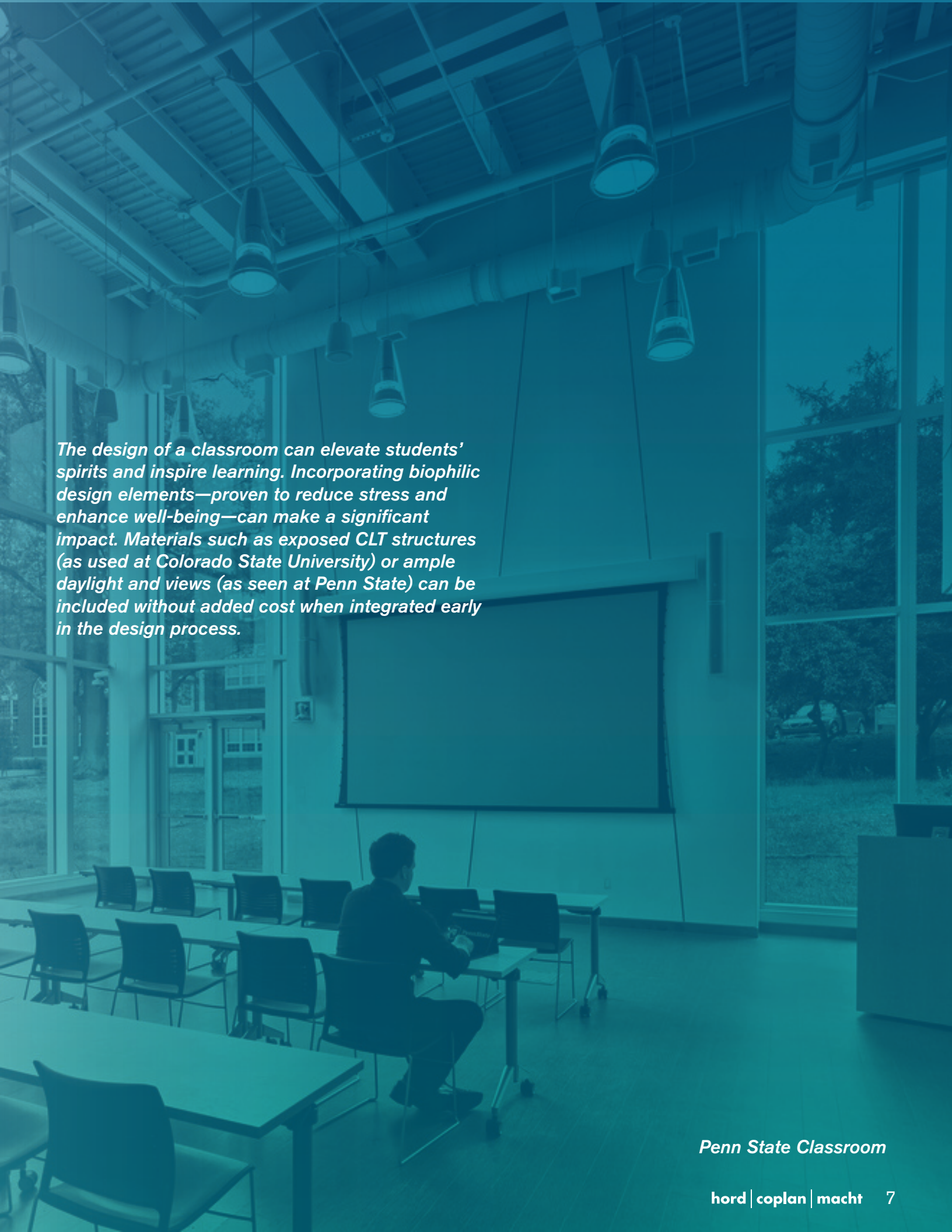
02
TECHNOLOGY

Technology will continue to evolve, so it is important to remember that the best classroom remains one that is appropriately sized for the pedagogy employed, with natural daylight, good lighting, and excellent acoustics.



Colorado State University Classroom.

New classroom technology should be judged by how well it supports learning for all students, giving everyone equal access and opportunity—no matter their background. It should also clearly improve learning by boosting student engagement, helping them understand material more fully, and strengthening their skills.



The design of a classroom can elevate students' spirits and inspire learning. Incorporating biophilic design elements—proven to reduce stress and enhance well-being—can make a significant impact. Materials such as exposed CLT structures (as used at Colorado State University) or ample daylight and views (as seen at Penn State) can be included without added cost when integrated early in the design process.

Penn State Classroom


REC

03
AV EQUIPMENT

Knowing that the hybrid classroom model is becoming a mainstay in education, Hicks advises institutions to prioritize foundational classroom design principles rather than chasing trends. Optimal learning environments remain those appropriately sized for their intended pedagogical approach, natural daylight, shades for ambient light control, controllable lighting, and excellent acoustics. Beyond these foundational elements, AV systems should primarily serve to enhance faculty and student engagement with course content. In many cases, simplicity is the most effective path to that goal. Rather than deploying complex systems that demand specialized training and procedures consider familiar, user-friendly paradigms to foster seamless transitions and build trust between users and technology, like intuitive input connections and simple USB conferencing cameras and microphones. If a program demands more complex AV solutions, ensure that you have a great support structure in place to train and assist faculty and student adoption.

Colleges and universities are increasingly utilizing platforms such as Teams, Zoom, and Google Meet to facilitate hybrid instruction, allow remote students to participate live, and record lectures for on-demand viewing. However, these tools also offer significant benefits for in-person instruction. For example, in-person students can access shared instructor content on their own devices, regardless of where they are seated. This eliminates sightline issues and reduces the need for large wall-mounted displays or expensive AV switching systems. Collaborative platforms like Google Docs and Microsoft 365 enhance real-time document editing and peer interaction, eliminating the necessity for a “group LCD screen” and allowing for flexible, screen-agnostic group work. This approach fosters more dynamic classroom layouts, where each student can contribute using their personal device, even one as simple as a smartphone!

AV equipment replacement is also a critical consideration in classroom planning. Nathan emphasizes the importance of distinguishing between durable and rapidly evolving AV components. Durable equipment, such as professional amplifiers, loudspeakers, projection screens, and structured cabling, typically has a lifespan of 10 to 12 years or more with proper maintenance. In contrast, rapidly evolving technologies, including video projectors, LCD displays, control systems, conferencing cameras, wireless collaboration devices, and computing hardware, often have shorter useful lifespans, generally ranging from three to seven years due to swift technological advancements and performance degradation. Institutions should strategically plan replacements by fully utilizing durable AV equipment for its intended lifespan while proactively cycling out rapidly evolving devices to minimize environmental impact.

04
ARTIFICIAL INTELLIGENCE (AI)

Moving forward, the classroom will serve as a space for synthesizing information, exploring critical thinking skills in the moment, and testing logic and reasoning skills along with public speaking and collaboration. Nathan notes that AI is helping to make classrooms more usable for faculty and staff. AV control interfaces similar to "Alexa" or "Siri" will simplify the use of AV systems in the future. Nathan also anticipates a shift toward practical, observable classroom activities, such as oral exams and in-person essays, alongside the careful integration of AI. Rather than restricting AI usage, educational focus will shift toward teaching students to effectively harness AI tools. Structured interaction with AI, such as evaluating AI-generated content for reliability, can improve critical thinking. However, it's essential to manage AI usage carefully to prevent cognitive offloading and diminished analytical skills.

As designers, we are planning for the use of AI in the classroom and preparing the space to be flexible – making sure spaces can accommodate individual or group work, in-person and virtual participation, and are equipped with strong WIFI assuming each student will bring a minimum of four Wi-Fi connected devices, including a smart phone, laptop, and additional devices like an Apple watch, Oura ring or AirPods.



Multiple cameras and projection screens are needed for HyFlex classrooms.



05
LECTURE CAPTURE

When it comes to specific conferencing and lecture capture technologies, typically, two cameras are installed: one that captures the presenter (faculty) along with the whiteboard or presentation screen, while the second camera captures the room itself. This dual-camera setup is particularly beneficial for presenters lecturing from remote locations, as it allows them to see the students in the room. In HyFlex environments, some are integrating ceiling-mounted beamforming microphones that have transformed hybrid classrooms by enabling every student to be heard, regardless of location. Beamforming technology is a signal processing technique used to focus a signal. However, these systems require careful selection, tuning, and control to ensure they capture relevant speech while minimizing ambient distractions. Where budgets



Zoom gallery of on-line students. Image courtesy of Colorado State University.

permit, supplementing with a gooseneck lectern microphone and/or a wireless microphone remains a best practice to ensure clear, consistent capture of the instructor's voice.

The decision of whether to implement voice lift should be made in consultation with qualified AV designers, as it involves a complex interplay of factors including room size, acoustic performance, mechanical noise levels, microphone type and placement, loudspeaker selection and distribution, and the zoning strategy used to prevent feedback and ensure clarity.

As new technology is considered, we advocate for keeping classroom design simple and purposeful. Rather than overcomplicating the space, the priority should be on creating environments that are well-lit, appropriately sized to support the teaching style, and flexible enough to adapt to changing enrollment and evolving coursework. Technology should be thoughtfully integrated—enhancing learning rather than overwhelming it—by supporting clear communication, collaboration, and access without dominating the space. Well-designed classrooms strike the right balance between adaptability, comfort, and function to meet both current and future academic needs.

Stay tuned for Article 2: Support Spaces in our series on Trends in Higher Ed Classroom Design.

Source: https://newsmediarelations.colostate.edu, CSU's College of Business first U.S. business school to provide on-campus, real-time online blended classroom through mashme.io technology, March 29, 2019



Designing classrooms to support students connecting four or more personal devices can streamline audiovisual infrastructure needs. By leveraging their own technology, spaces can prioritize acoustic excellence, quality lighting, and ergonomic comfort—while personal devices enhance content visibility, peer-to-peer collaboration, and audio clarity.

hord | coplan | macht

www.hcm2.com

ARCHITECTURE
LANDSCAPE ARCHITECTURE
INTERIOR DESIGN
PLANNING
GRAPHIC DESIGN