How Technology is Reshaping Higher-Ed Learning Spaces

...and the power problem it created

Charger anyone?

When it comes to interactive work or class discussions, 71% students preferred to be on campus.

EDUCAUSE's 2023 student survey

Technology is advancing at a breakneck pace, often exceeding our wildest expectations and posing an exciting yet daunting challenge to keep up. While these innovative leaps bring remarkable advantages, they also come with their own set of challenges—not only in logistics but also in transforming our learning spaces. In just a few short years, campuses have undergone a radical shift from traditional, lecture-heavy environments to dynamic, blended, and always-connected ecosystems. Trends like hybrid/HyFlex teaching, AI-supported coursework, and immersive / XR activities are now shaping the brief for capital projects and renovations. EDUCAUSE's 2024 Horizon Report (Teaching & Learning) captures the arc: institutions are redesigning courses and rooms to support flexibility, equity and emerging tech—while wrestling with the costs and complexity to support it all. [1]

Culture + modality: designing for learners on-campus and at home

Students increasingly expect choice in where and how they learn. EDUCAUSE's 2023 student survey found the students preferred different environments depending on what the method of teaching was and what they were studying. When it came to interactive work or class discussions, 71% and 59% students preferred to be on campus. Whereas exams and research leaned more towards online learning. [2]

Regarding specific activities there was more liberal consensus that it should be a choice and that either online or on site would be OK. Interestingly, there are commonalities within the workplace where younger generations are preferring to have the choice between working from home or going into the office for meeting and collaboration. The consensus within higher education is that spaces need to accommodate both types of learning to ensure all students feel included and drive satisfaction. At the same time, HyFlex instruction remains demanding: faculty report the difficulty of teaching equitably to simultaneous in-room and remote cohorts, and leaders continue to weigh-in whether HyFlex is worth the trade-offs. [3]
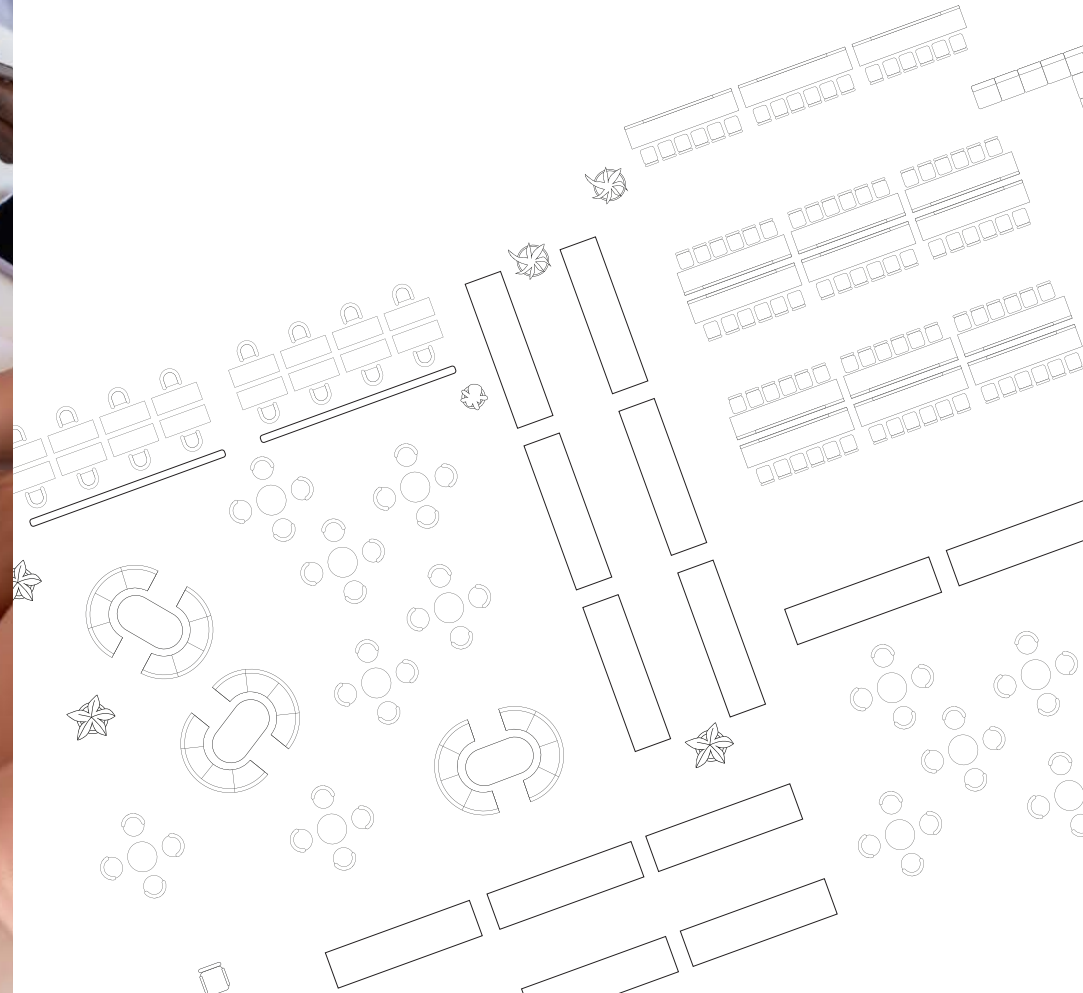
About 1 in 5 undergraduates are parents of young children

95%

of students own a laptop and 98% own a smartphone

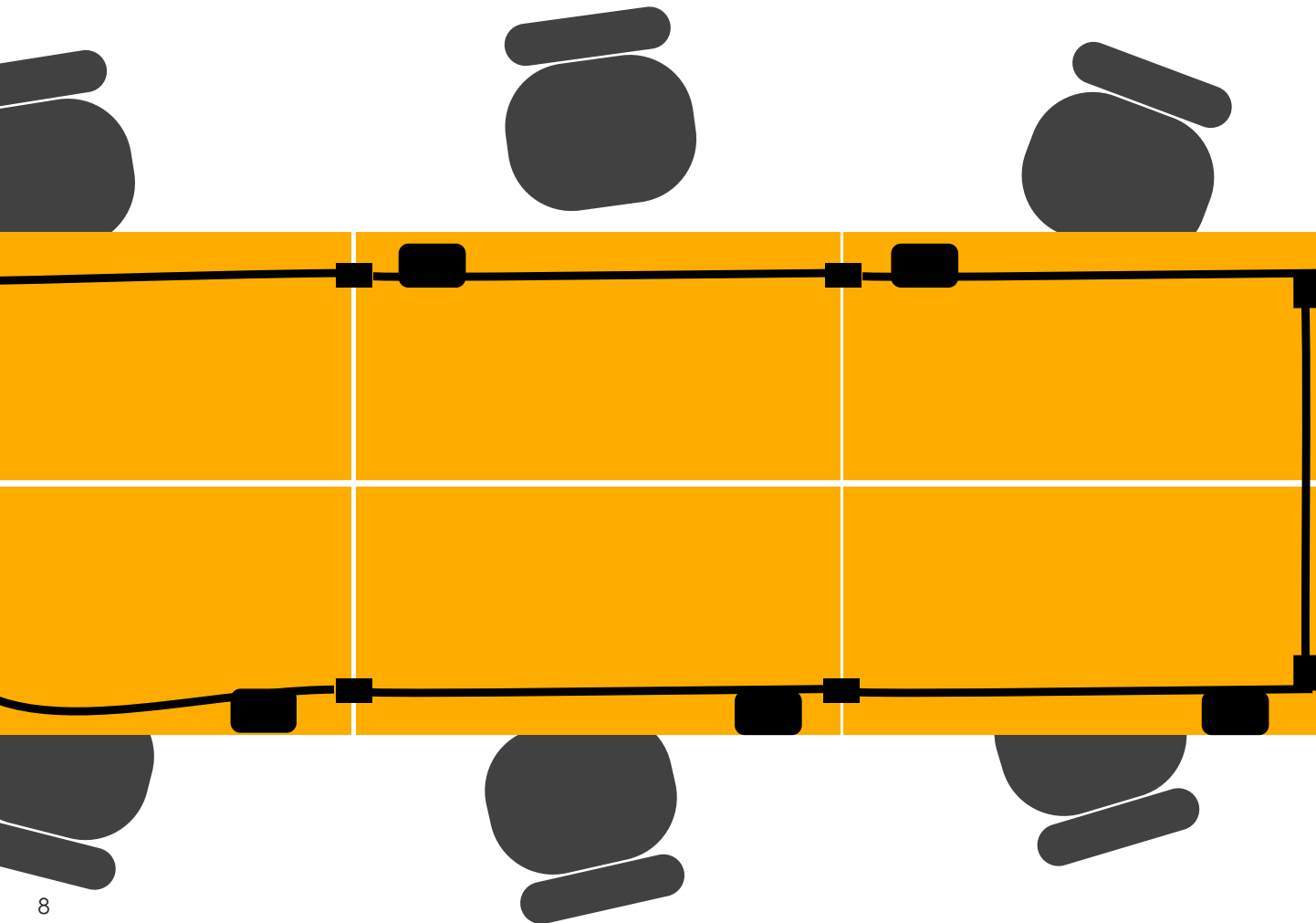# Device proliferation turbo-charges demand for power

Most students carry two devices with a recent UC Davis student survey finding 95% of students owning a laptop and 98% own a smartphone.[4]

Another survey revealed that 82% of respondents at NC State University Libraries said they "always" need power outlets when using library spaces - meaning seats or desks without power are generally under used.[5] This leads to students explicitly complaining about a shortage of power outlets and that it leads to disruption and hindering coursework.[6]

Furthermore, libraries are a hub for charging devices leading to an expectation from students and pressure on library staff to provide solutions. A lack of charging facilities can also lead to unnecessary stress and anxiety given our reliance on our phones, not just for studying and connecting, but also for entry and payment systems.
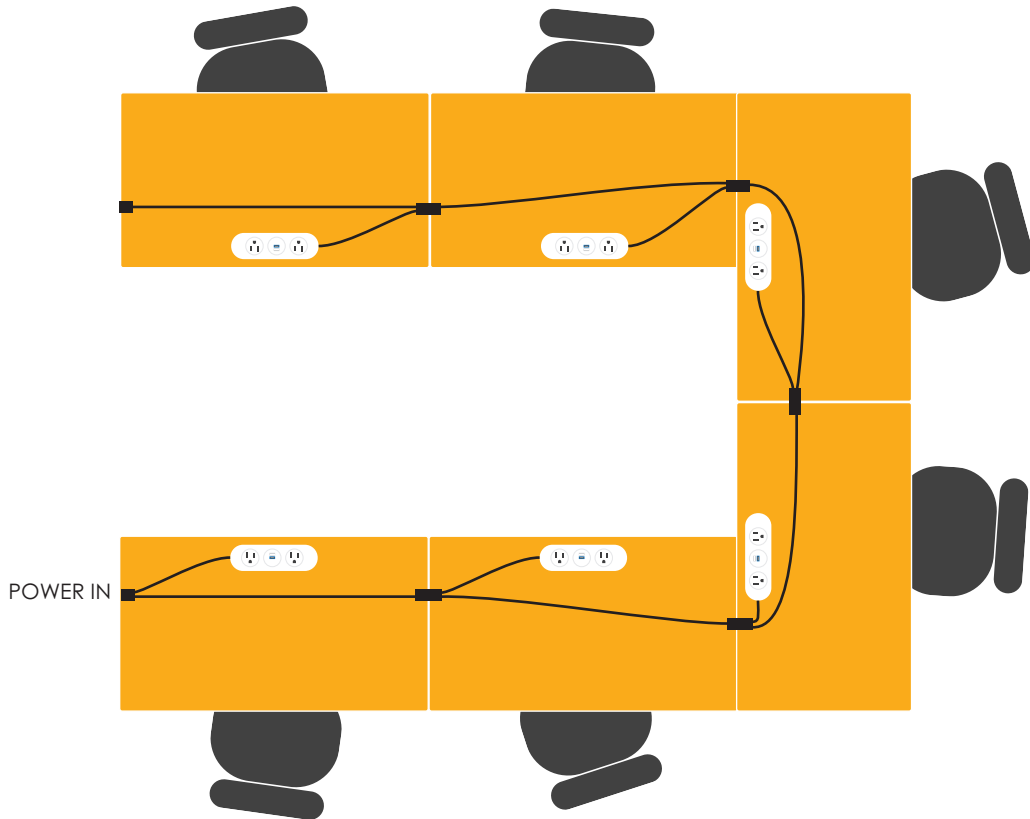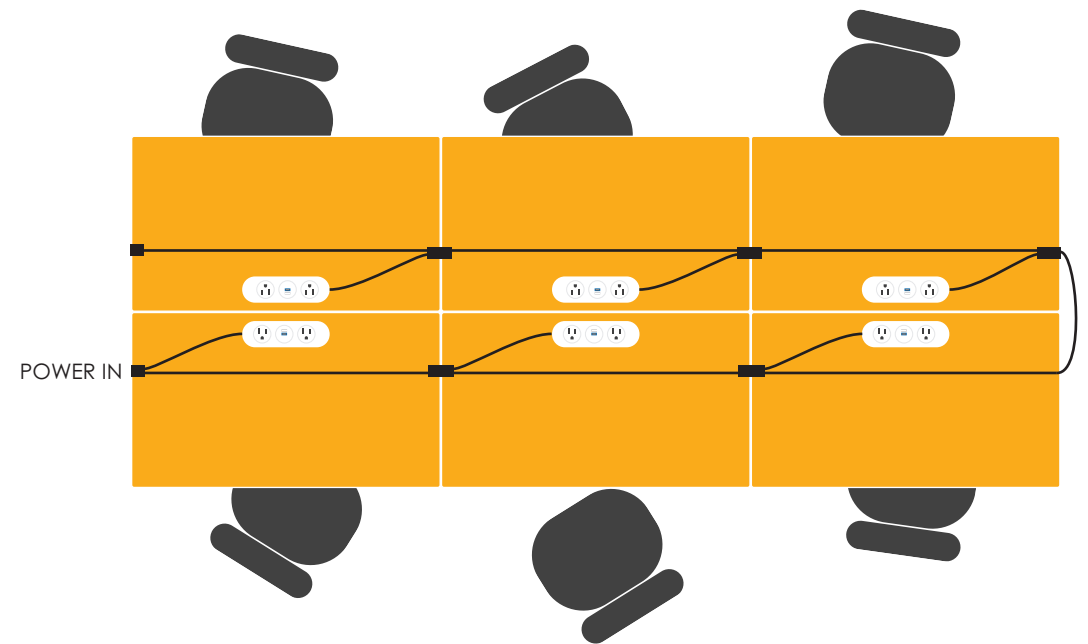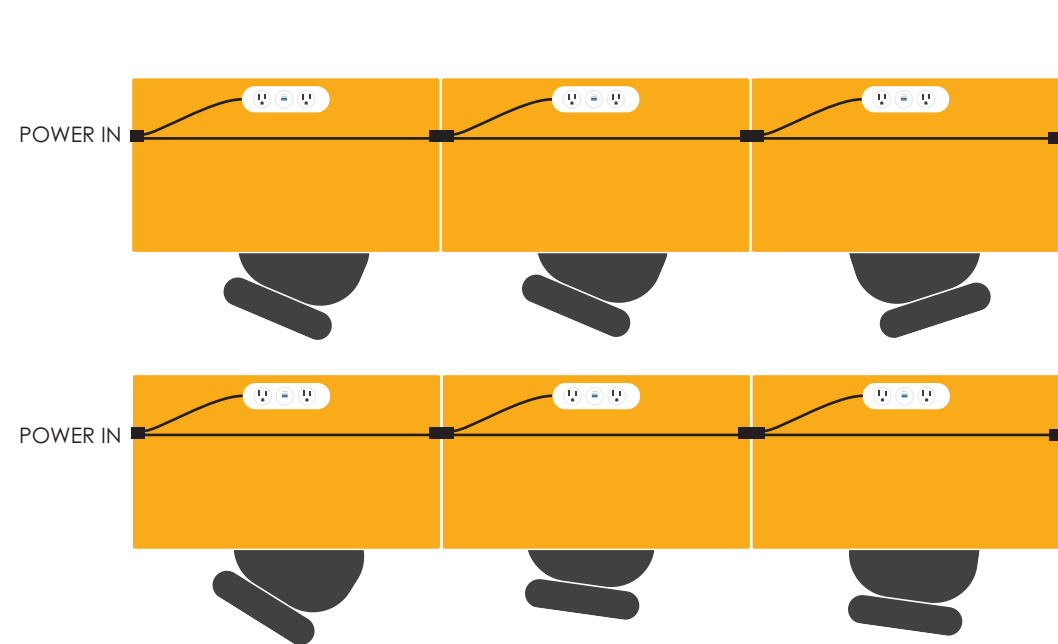
From fixed rows to flexible studios

Space standards have followed pedagogy. The Learning Space Rating System (LSRS), widely used across higher ed, pushes campuses toward rooms that support active learning across multiple modalities—think movable furniture, sightlines to multiple displays, good acoustics, and plug-and-play tech. While LSRS doesn't prescribe exact outlet counts, it consistently nudges institutions toward technology-ready, reconfigurable rooms. [7]
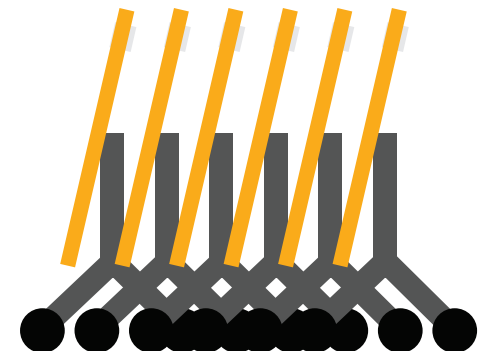
Fortunately, there are now plug and play systems available to allow tables to be connected and disconnected with ease through flexible and agile plug and play power strips. Add to this the evolution of mobile battery systems that negate the need to be near a wall or floor socket and bring true agile power to activity-based learning rooms.

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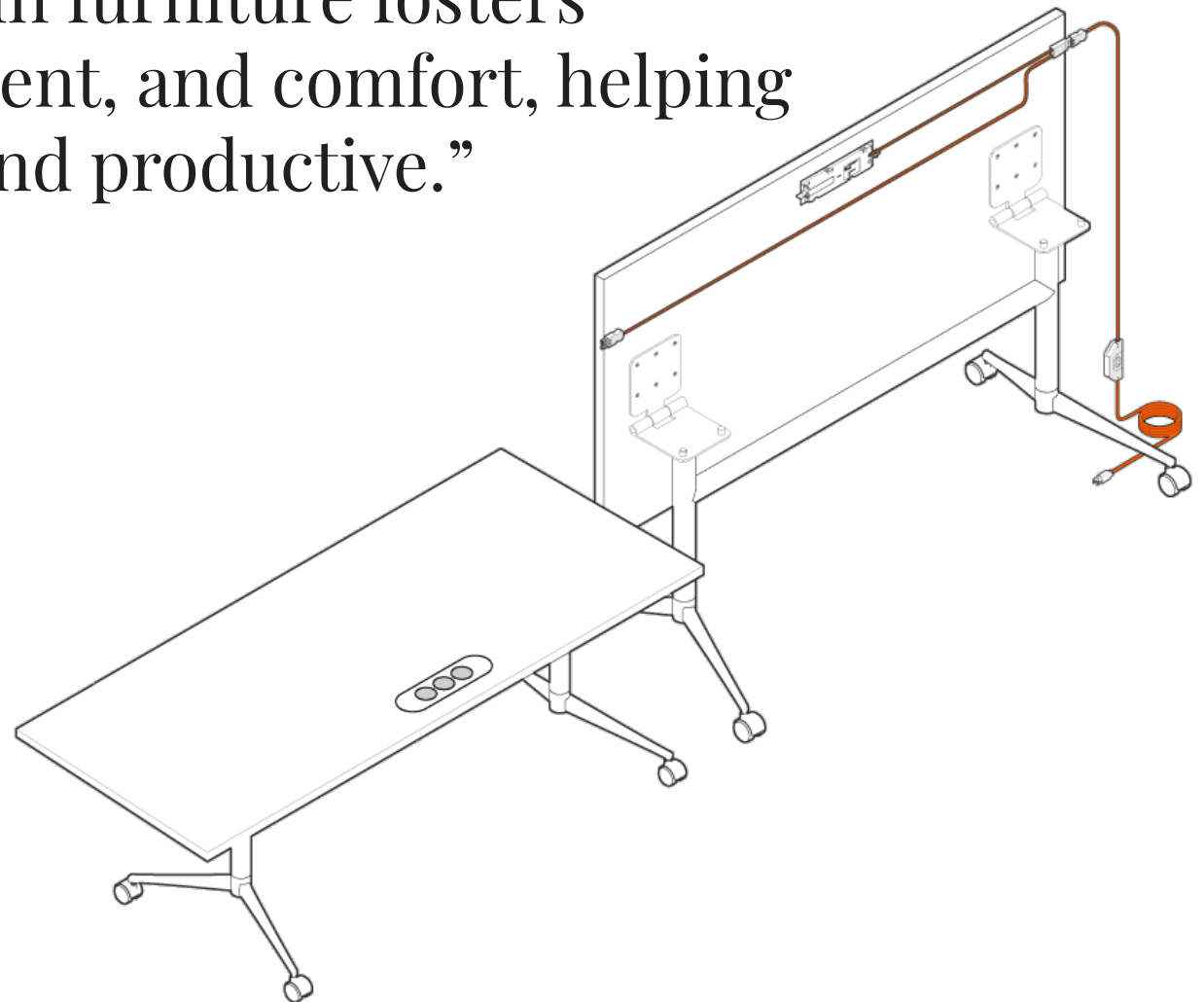POWER IN

Plug n' Play power makes configuring tables and desks easy without the messy cords

"Movable chairs, modular desks, and writable surfaces allow students and teachers to reconfigure the room for a diverse range of activities. Flexibility in furniture fosters collaboration, engagement, and comfort, helping students stay focused and productive."

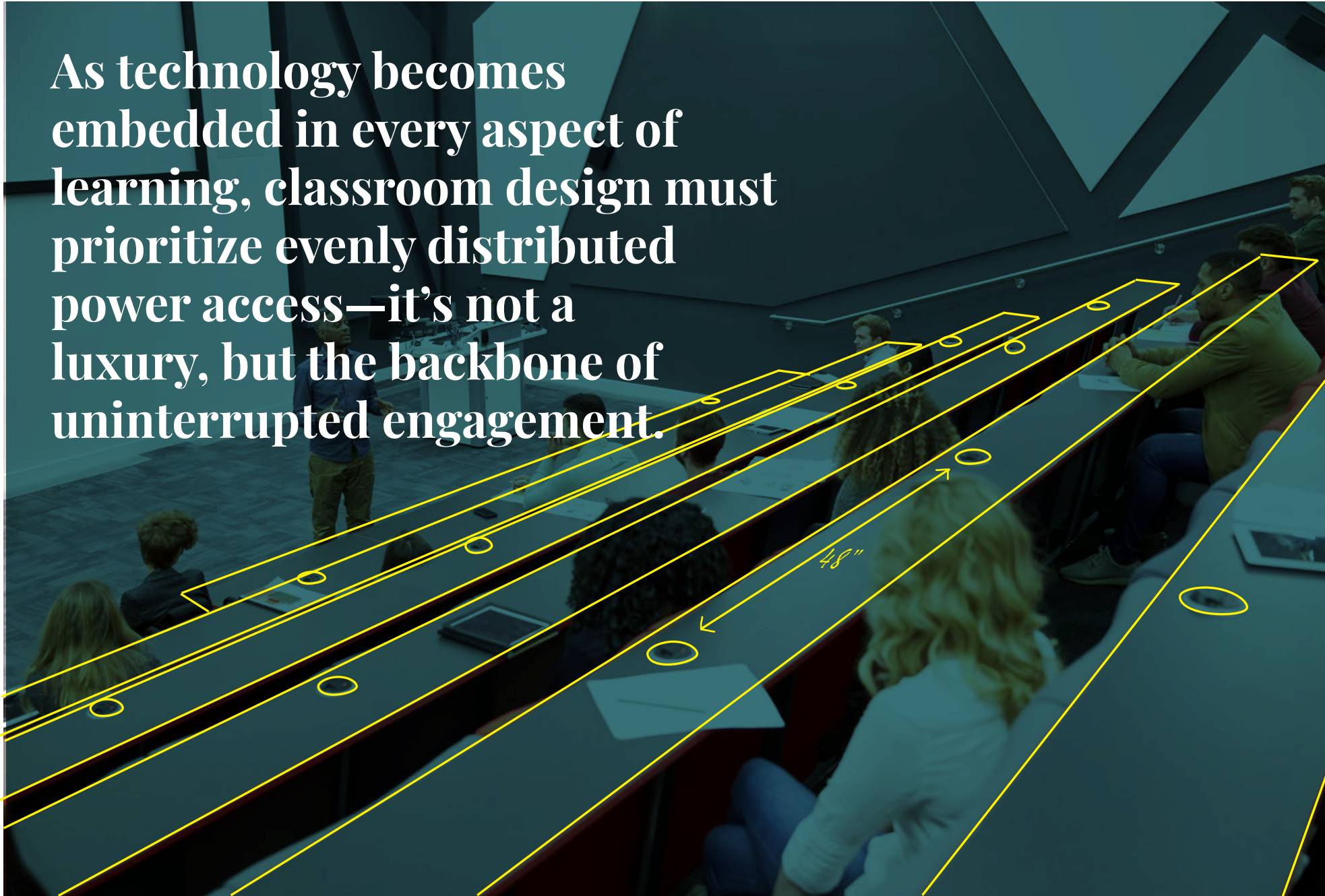ondiversified.com: Modern College Classroom

The charging reality: density, distribution, and safety

Power access is no longer a "nice to have." University guidelines are beginning to spell out outlet density and placement - especially to keep cords out of aisles when rooms reconfigure. The University of New Mexico's Learning Environments Design Guidelines are unusually explicit: target one quad outlet per 8 students (up to 1:6 in heavier-use rooms); use floor boxes when cords might cross aisles; and, where walls and floors can't be touched, drop ceiling-mounted "tele-power" poles. The same document even notes "minimally 1 power plug for each student" where mobile computing is expected. [8]

But not every campus is ready to electrify every seat, and some are exploring "power by zone" for cost control. Dartmouth's 2023 renovation standards advise powering portions of the room (e.g., one-third to one-half of seats in large lecture halls) and balancing future needs against construction expense.[9] For flat-floor, flexible rooms, the University of Michigan recommends flush floor outlets to enable frequent furniture changes without trip hazards—However, this can prove expensive and time consuming if it involves core drilling and there are better ways to bring power into the middle of multipurpose rooms, as discussed later.

As technology becomes embedded in every aspect of learning, classroom design must prioritize evenly distributed power access—it's not a luxury, but the backbone of uninterrupted engagement.

48"

Don't forget informal learning zones

Learning now spills into corridors, atria and libraries, where students work between classes and commuters "camp" for longer stretches. Campuses are designing better spaces for this type of learning with casual, or occasional use furniture, but this requires some clever thinking when it comes to providing power outlets. Portable charging systems are one way of facilitating this challenge where a student 'checks-out' a mobile power bank to be used while in the zone and checks it back in after use. These sorts of solutions can be installed in a matter of minutes with little to no disruption to service.

USB-C is becoming ubiquitous among personal devices

Designers can plan confidently around USB-C Power Delivery (PD) as the cross-platform standard. USB-IF now certifies PD 3.1 "Extended Power Range" up to 240 W, enabling high-wattage laptop charging from a single USB-C port—so long as the cable and charger are rated appropriately (E-marked 5 A cables for >100 W).[10] Generally speaking, most laptops will charge between 60-100W.

The ecosystem is converging, and most modern laptops accept a USB-C for charging and connecting to external monitors. Since the iPhone 15, all iPhones use USB-C and Android phones have been using USB-C for even longer. The EU's common charger rules (in force for small electronics since December 28, 2024, and for laptops from April 28, 2026) will further normalize USB-C hardware worldwide—affecting U.S. campuses via student device choices.[11] However, there is still work to be done in communicating and understanding the benefits of USB-C and how there is no longer the requirement for the laptop 'brick' provided there is suitable USB-C charging available.

"There are chargers, but the majority of them are broken."

"The ones in the hallway work well, but they don't work at all in the classrooms."

It is common for a combination of AC power and USB-C outlets to accommodate everyone. And there can still be issues with students using a low quality, low power USB-C cable, that won't necessarily charge their laptop fast enough, leading to disappointment and frustration.
If campuses are to invest in future proof technology, it's important they communicate and educate appropriately to improve uptake. Another thing to consider is the resilience of chargers around the campus. Anecdotal evidence suggests that even when there are chargers they don't work:

New technology is great, but only if it's robust and works well. Some early USB chargers provide a very low wattage of around 25Watts. This is fine for your phone but won't charge your laptop. It's also inevitable that USB chargers will get damaged in high traffic areas such as libraries, classrooms and eating areas so it's important the chargers are easy to repair or replace. Replacing the whole power module is expensive and wasteful, but if the USB module alone can be replaced it provides a cost-effective solution, that is quicker and more sustainable. OE Electrics provides a replaceable USB module that can be replaced without the need of an electrician, or even switching off the power.
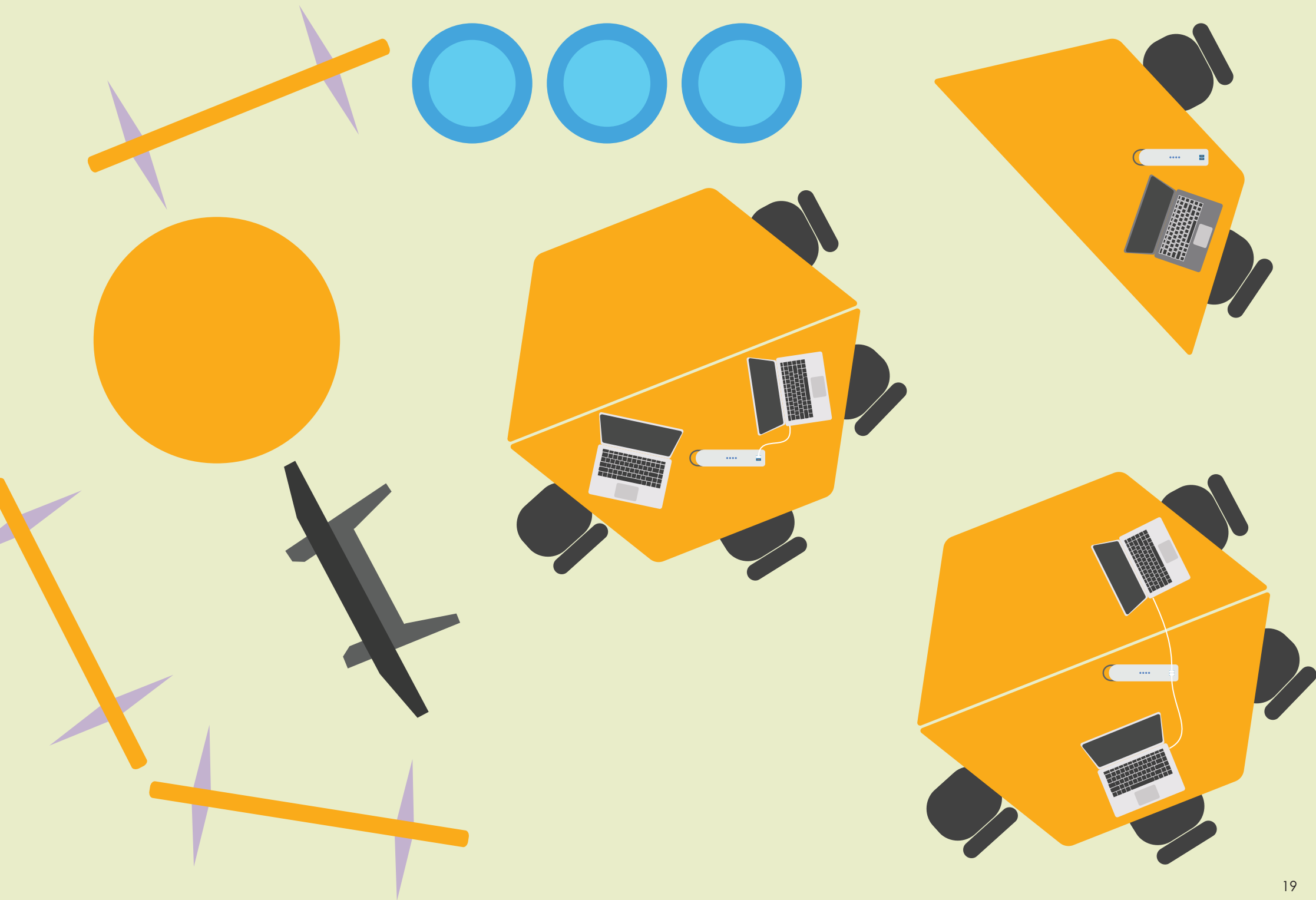
Fast paths to flexibility: mobile power and mobile displays

"It was crucial for the [restaurant] area to offer charging facilities for both students and staff. Installing new sockets would have been both costly and time-consuming; therefore, OE Electrics' mobile battery solution, Animate, was an ideal choice. It was quick and easy to install while providing high-power USB charging for everyone."

Ian Harris (Head of Maintenance), University of Oxford, Saïd Business School.

Modern flexible classrooms look very different to the traditional lecture hall or classroom. Tables or pods of students are organized around the room possibly with a display at each table. The classrooms are often fitted with audio-visual equipment so online students are included in the discussions and don't feel left out. The classrooms can also be re-arranged to suit the needs of the teacher or students, which brings challenges to distributing power where it's needed.

Mobile power is now playing a more important role in the design of these learning spaces with battery-powered mobile displays that can be powered and moved around without trailing cables. Desks and pods can be fitted with battery docks that power up USB-C chargers around the edge of the table to provide power for the students' laptops and tablets. These mobile power banks are charged overnight in a charging cart ready to be used the next day, and because of their high capacity they will generally last over a few classes. Installation is quick, in fact an installation at the University of Oxford Saïd Business School only took "10 minutes" to install the battery dock and 4 additional USB-C high power chargers.[12]

A workable roadmap for facilities & IT

With so much to consider in the design, or refurbishment of old campuses, it's essential to plan-in what the future may hold.

The University of New Mexico has created a Learning Environments Design Guide (LEDG) which will set out guidelines for facility, staff and teachers on how to put together a flexible classroom and ensure it has everything required to be successful.

Set a campus power policy: Create suitable ratios of power to students. Don't necessarily rely entirely on corded power as battery power may work out more cost effective.

Design for change: With technology and teaching methods evolving, the learning space needs to adapt to those changing needs. Think about how the power distribution can be flexible without causing trip hazards or limiting the placements of tables.

Blend Fixed and mobile power: Depending on whether the furniture is fixed or flexible will change the way power is delivered. Traditional lecture halls, for instance, are fixed but cramped, so a small high power USB-C charger would suit this environment. Activity based learning spaces, however, need a more flexible solutions such as battery packs with high power USB-C outlets.

Extend charging beyond classrooms: Don't forget about those casual areas where students can study between classes or while having lunch. Power needs to be safe and accessible.

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Final note

The design of spaces in the context of advancing technology and its growing influence requires careful consideration. It is essential to develop resilient solutions that are adaptable to change while also enduring the rigors of daily campus activity. Although, it may seem obvious, using technology to study is now part and parcel of university life. Ensuring students have the ability to charge these devices should be pretty high on the priority list.

Additionally, it is important to incorporate maintainability and sustainability in anticipation of evolving pedagogical needs. Planning frameworks like the Horizon Report,13 Trend Watch,14 and LSRS and investing in solutions that adapt can help keep capital plans aligned with the next wave of teaching practice.

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How Technology is reshaping higher-ed learning spaces and the power problem it created explores the impact of tools like AV systems, laptops, and tablets on campus design, and highlights why reliable power provision has become a critical factor in modern learning environments.

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