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Beyond the Desk: Collaboration Furniture for the Future

Schools and universities have a superpower: the ability to shape how people think, learn, and interact with each other. In a hyper-polarized world, learning institutions have a responsibility to teach students how to come to consensus. This process starts as soon as students enter the classroom for kindergarten and follows them through their postsecondary years. Collaborative furniture, coupled with creative pedagogy, can lay the foundation for their future.

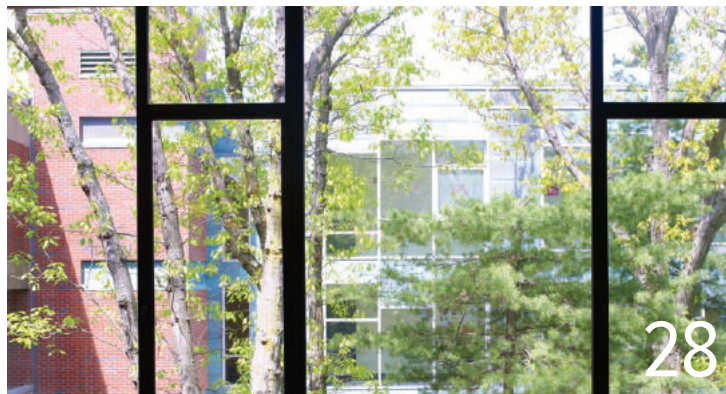


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Lisa Engel, Associate Professor of Nursing and Director of Simulation at Harding University, skillfully fulfills a great many responsibilities in her various roles: she teaches demanding nursing courses in several degree programs and has been instrumental in establishing and continuing to develop the school's simulation program. Her zeal for high fidelity nursing simulators impels her to continue finding and exploring the most current innovations available, and she is always delighted to see the students hone their clinical expertise and judgment as they interact with the simulations in the program she oversees.

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Editor's Letter

JULY 2023

Dear Readers,

Summer is in full swing, and I hope this letter finds you in good spirits and enjoying the sunshine. As we embark on this season of growth and rejuvenation, we wanted to reach out to you, our valued readers in the private higher education facility community, and share some exciting updates.

We are delighted to inform you in the coming issues of the ongoing building and facility improvement projects taking place on campuses across the nation. With the quieter summer months providing an opportune time for renovations and upgrades, our institutions are bustling with construction and transformation. These projects aim to enhance the educational experience and create environments conducive to collaboration, inspiration, and growth.

While we celebrate progress and innovation within our educational facilities, we are reminded of the upcoming Fourth of July holiday—a time to come together with loved ones and honor the cherished values of our nation. This festive occasion presents an opportunity to gather with family and friends, sharing laughter, stories, and a sense of community. Whether you're enjoying a backyard barbecue, watching fireworks light up the night sky, or engaging in heartfelt conversations, may this holiday be a reminder of the strength and unity found within the bonds of family and friendship.

We extend our heartfelt gratitude to every one of you who contribute to the advancement of higher education. Your dedication, passion, and unwavering commitment to fostering a transformative educational experience make a significant impact on the lives of students and the communities we serve. It is through your tireless efforts that our institutions thrive, nurturing a new generation of leaders, thinkers, and change-makers.

In closing, we want to express our sincere appreciation for your readership and the role you play in making the experience of higher education richer and more rewarding for all. We are inspired by your dedication and the positive impact you have on the lives of students and the broader educational landscape.

Wishing you a memorable Fourth of July celebration and a summer filled with moments of joy, growth, and connection. Thank you for being a vital part of our community.

With deepest gratitude,
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A Passion for Nursing Simulations at Harding University

BY CYNTHIA MWENJA, PhD

Lisa Engel, Associate Professor of Nursing and Director of Simulation at Harding University, skillfully fulfills a great many responsibilities in her various roles: she teaches demanding nursing courses in several degree programs and has been instrumental in establishing and continuing to develop the school's simulation program. Her zeal for high fidelity nursing simulators impels her to continue finding and exploring the most current innovations available, and she is always delighted to see the students hone their clinical expertise and judgment as they interact with the simulations in the program she oversees.

Nursing Educator

Drawing on her clinical expertise in labor and delivery, Engel teaches in three of Harding's nursing programs. Within the Bachelor of Science in Nursing (BSN) degree program, she teaches Women's Health. In January of this year, Harding began offering an accelerated, hybrid BSN program in northern Arkansas; Engel teaches women's health in this program, which is offered in partnership with Orbis Education and allows students to earn a BSN within sixteen months. She says that working with Orbis has caused a lot of growth because it has meant that members of the nursing faculty have needed to reconsider their courses, thinking about how to transfer knowledge in different ways that do not depend on lectures only. While Engel had previously taught online courses, she says that this initiative offered a great opportunity for the nursing faculty to refresh the courses overall.

Additionally, Engel teaches maternal-child nursing in the newly-established

Master's Entry into Professional Nursing (MEPN), which is the first program of its kind in Arkansas. MEPN students graduate with a master's degree in four years, and they are prepared to take the NCLEX national nurse licensing exam. Engels states that the first class just graduated from this program in May; all of the students have jobs, and all who have taken the NCLEX to date have passed. This program is gaining a great deal of interest and recognition, Engel states, and the impressive results are a clear indicator of why

Debora Nutt, Professor of Nursing and MEPN Program Director at Harding University, recalls that when Engel taught epidemiology, she saw that the content overlapped with a population health course. To better differentiate the two classes, she focused on developing countries in her course; this focus tied nicely with the focus on missions at Harding. Harding offers a wide array of study abroad for its students, and the Harding in Zambia program has a medical clinic in which nursing students

can serve. Engel says that quite a few nursing students take advantage of this opportunity. Engel herself was able to spend a month in Zambia last year as an assistant. In a fun twist, a former student of hers directs the program, so she was supervised by someone she had previously supervised.

Simulators and the Simulation Lab

Nursing programs have begun to rely more and more on high-fidelity simulators to teach students clinical skills. As the Healthy Simulation website states, "High Fidelity Simulation is a healthcare education methodology that involves the use of sophisticated life-like manikins (sometimes called mannequins) in realistic patient environments. Simulation scenarios can take place anywhere, from austere environments for EMS or Military Simulations, to clinical environments like surgical simulation inside a simulation center. These complex manikins, which are also known as human patient simulators or high-fidelity simulators mimic human anatomy and physiology."



PHOTO COURTESY HARDING UNIVERSITY

Simulators offer a low-stakes place for students to practice and make mistakes in a realistic environment, Engel notes. Faculty members can take a particular incident and allow it to unfold slowly within the simulation, and they can de-brief with the students afterwards. According to Nutt, simulations are designed for two to four students; roles can include “lead,” “supporter,” “documentation reporter,” and “medications nurse.”

During the pandemic, the nursing program began to rely more on virtual simulators, as well. When students interact with a virtual simulation, they first encounter some introductory material. When they enter the simulation itself, they are behind the camera and can decide how to interact with the people and devices in the room. Engel says that there weren’t many virtual simulators available at the start of the pandemic, but now offerings have really expanded. Engel foresees that, in the future, both simulation labs and virtual simulations will be overtaken by simulations conducted using virtual reality goggles.

About ten years ago, Dr. Swaid Swaid—a well-known neurosurgeon practicing in Birmingham, Alabama—generously donated funds to build the Swaid building on Harding’s campus. Engel says that the building includes an excellent simulation center which has four hi-fidelity medical/surgical simulation spaces and a suite for maternal-child nursing. The addition of the simulation center allowed this aspect of the nursing program to explode, Engel says. Now, Engel says, Harding’s simulation lab is used “non-stop” and that they are fortunate to have been given both the space and the budget for equipment.

The College of Nursing worked with the College of Pharmacy to procure a Pyxis™ MedStation™, which is an automated medication dispensing system. During simulations, the medications that students dispense are simulated, as well. Students also use a scanner to scan the medications and the arm band of the “patient,” and the scanner interfaces with simulated medical records from Elsevier.

Harding has a variety of manikins in the simulation lab, including preemie and newborn babies, a toddler, and a seven-year-old child, in addition to various adult manikins. Engel says that students can interact with the manikins in many ways: “they can hear the heart, lungs, and bowel sounds; they can check the pulses, take blood pressure, give an EKG. They can even intubate the manikin!” With the maternity manikins, student nurses can deliver a baby.

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Simulation Program

As Director of Simulation, Engel helped to establish the program, and she has continued to develop its offerings as it has grown steadily over the past ten years. Once the simulation center and equipment were in place, they then needed to develop the guidelines and curricula for the labs. Engel set to work researching requirements and standards for simulation programs. The International Nursing Association of Clinical

and Simulation Learning (INACSL) sets standards in this arena, and the state board of nursing set programmatic requirements. Engel gathered that information, then mapped it onto the curriculum, asking questions such as “What do students need to know?” and breaking the requirements into discrete learning objectives and lesson plans. Nutt says that Engel makes sure that all faculty are trained on using sims and that the sims all use a standardized format.

Now, Nutt says, some faculty have developed their own sims, and she points out that doing so is a great deal of work. In writing a sim, the creator needs to think through the most effective ways to portray an experience that will lead to the desired learning outcomes, decide how long the sim will last, and create pre-briefing and debriefing materials. Nutt, having completed a home health sim over the Christmas break, emphasizes just how much time and attention it takes to plan out the entire scenario and get

it just right in order to best serve the students and program.

The goal at Harding is for students in classes with clinicals to work through six sims during the term and serve as lead nurse in half of the scenarios. Nutt says that, in the sims, they focus on important nursing experiences, such as blood clots, gastrointestinal issues, diabetes management, COPD, and orthopedics issues; the sim may also potentially include common complications. In the obstetrics sims, students see the normal birthing process, but they also encounter complications like excessive bleeding, retained placenta, or an emergency with the mother after the birth. They get to perform assessment of the newborn; that responsibility is usually taken by others in a live clinical setting. These experiences train nursing students to recognize any issues quickly. Nutt points out that, with hospital-based clinicals, the students see a random array of ailments, but simulations can ensure

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that they see the common big challenges that they absolutely need to be able to manage in their professional lives.

Not only do all nursing classes with a clinical component use simulations for part of the clinical experience, but Harding


students also participate in interprofessional simulations. Students from the College of Pharmacy, the physician assistant program, and the nursing program work together to complete a high-fidelity resuscitation simulation together, with each student

taking the role they will assume in their professional lives in such scenarios. In some simulations, the nurse might need to call the pharmacist or the physician assistant who is in another location. All of the situations teach the students to work together before they graduate. While many medical education programs require such interprofessional training, nursing programs in Arkansas do not currently require it, so Harding's nursing students are gaining additional vital experience prior to graduation.

Part of Engel's role as Director of Simulation is to insure that the curriculum stays current with accreditation standards; she also trains the faculty to design and run simulations. Further, she conducts annual programmatic review and needs assessment, then works to implement improvements across the nursing curriculum. Within that programmatic review, Engel follows up with faculty members to make sure they are evaluating their own sims at the end of each term.

Another part of the job she enjoys is keeping abreast of new technology and new manikins that come on the market. She laughingly says that she "plays hospital instead of playing house!" Nutt calls Engel a "tech guru," saying that "if there's something new, like an e-textbook, online lessons, or online sims, she'll be the first to check it out and introduce it to the faculty. She digs into what is out there and thinks about how we could use it." Nutt goes on to say that Engel is "one of our star faculty; she is knowledgeable about research and thinks deeply about how to do things differently and effectively to serve faculty and students. She thinks about both."

Engel says that the best part of her job is seeing students learn through participating in simulations—seeing when they make connections, seeing them use critical thinking and clinical judgement. She enjoys all the aspects of her job, but she would love to have more time to spend "submerged in simulation."

 ABOUT THE AUTHOR: Dr. Cynthia Mwenja teaches Composition and Rhetoric at the University of Montevallo.



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FACILITIES &
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Outfitting Auditoriums with Multi-Purpose and Flexible Staging

BY KIP WEIS AND RICK ROE

Today, universities and colleges across the country are facing challenges in meeting the demands placed on them to provide the best possible education as well as ensuring that their students get the most out of their education. There is also constant pressure to provide the finest amenities for incoming students.

Everyone wants to have the best system that is safe, enhances their performers' onstage presence, and allows them to perform at their best. Getting top-of-the-line equipment can be difficult for smaller schools that may have a very limited budget allocated to the performing arts. Words like "multi-purpose," "flexible," and "modular" become an important part of the planning vocabulary for those focused on meeting the needs of campus performance groups.

Top-Level Equipment for Recruiting and Retaining Talented Students

Many professors and performing arts directors are great negotiators and top-notch fund raisers on top of their many other gifts. These fortunate ones have unlimited access to extremely wealthy donors, intensely active parents or booster

organizations or have an altruistic local company or organization that supports their every need.

For the rest of the teachers and directors, they have to work to find the extra money to support the programs. Schools that do not have the free flow of financial support must find creative ways to secure funding for top-level equipment that allows students to perform at the highest level. Finding other departments that have similar needs and are willing to find a cooperative solution may be the best in-house option.

A few ways of joint collaboration with other departments or the administration may allow planners to find additional applications for staging or risers that can help to justify the purchase. If collaboration is possible, the best place to start is to call on the other performing arts departments. The overall impact can be reduced if all stakeholders can come to a

consensus on what the bulk of the staging needed is and what is really needed for all programs involved to share.

Then specialty items would only need to be added for specific, limited purposes. A choir and band director collaboration could yield either individual drum risers, keyboard risers, or a large, raised percussion platform that can make the orchestra or band look spectacular for the winter and spring concerts. These same staging components can then be repurposed to build a 3 x 3 configuration or be deployed in the theater department for on-stage risers in the next performance.

When faced with the need for a multi-purpose option in the permanent auditorium, there are a few options besides on-stage risers to help make the space more flexible. Such options could create a more intimate space for the performers and audience as well as accommodate any programs that have outgrown the current allowed space. The easiest option in lieu of building a new facility will be to extend the stage with either a stage extension, or—if the theater has an orchestra pit, to fill it with platforms. There are several considerations to take into account before any product is

purchased. Some of the following points may help campus decision-makers make the best decision for their programs and facilities.

Getting Started

Multiple users occupy most performing arts facilities. Meeting with the other users of the space to determine and agree on what the primary needs are is a great first step. Working as a team to collaborate and come to agreement on what the top priority needs are is a very important first step prior to contacting a manufacturer of staging.

A few questions will immediately come up and will need to be addressed before starting the project. They can include the following concerns:

1. Should the stage extension/pit filler be just at the existing stage height, or should it also be able to be set up at audience level and orchestra level?
2. When set at stage height will a spanning or bridging design be needed to offer clear space

under the decking for the orchestra or for storage of equipment, pianos, or instruments?

3. How will the conductor view the orchestra and the performers on stage during a musical performance?
4. If a decking set at audience level is desired, will chairs be mounted in that space in order to increase seating capacity up close to the stage?
5. What other configurations or uses for the equipment are there? Some systems will allow risers to be made from the same decking but using different height supplemental supports.
6. Who will set up and take down the equipment, where will it be stored, and what weight capacity will it need to support?
7. Will there be a need for grand pianos, lifts, heavy scenery elements, or large numbers of moving performers?
8. Who is paying, what is the budget, and what is the ideal timeline for completion of the project?

Multiple meetings between the various stakeholders will be needed over a period of time before consensus can be reached regarding all these important considerations. Once the needs of the facility have been discerned, then planners should contact some professional staging manufacturers for guidance. This important step ensures that an engineered system will be developed for the application and will fit the constraints of the facility. In-house construction carries many risks and should be avoided.

Design Process and Construction Considerations

The design priority is that these modular units be extremely strong and safe in order to withstand the live loads and action performed on them by a large quantity of enthusiastic performers. Safety, meeting code, ease of use, versatility, quietness, and stability of the platforms, as well as how they store, are all important considerations to weigh out. Planners should be prepared to share a lot

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of information with the staging company, including the ideal scope of the project and all of the needs that the user group outlined. The staging company will need to know the exact dimensions of the space, and they should have access to as many details, drawings, and photos as possible; the more detail the better.

Once the group is ready to move forward, planners should contact several staging companies. A minimum of three different bids should be sought to make sure all aspects from budget to the projected design are met. Most staging companies can typically generate a professional design

layout, equipment list, and quote within a few days. Planners need to ask for multiple photos, specs, and support materials; references and testimonials from other customers can help with decision-making. Price should not be the only consideration, especially when taking into account that everyone involved will live with this system for many years; the best match for the identified needs should be selected if possible.

Equipment Options

There are many options for equipment types and materials that can be used to build the system. The staging company will be able to help build a system that will function safely at the needed height and required configurations. The performance surface can be made to fit your event needs or to match your main stage to give it a permanent look. Another consideration should be that the platform is quiet for the performers and will not be distracting when they transition from the main stage to the extension. The system should be designed in a way that all of the components work together to provide a stable area for your dancers, actors, or the orchestra. Having a stage that has platforms that bridge together and supports that have cross bracing is not only an option but a must-have if your stages are higher than sixteen inches.

Certainly, the staging manufacturer should provide a stage that will meet the building and fire code standards as an integral part of the design and construction. The manufacturer should perform the installation and training to ensure all the components fit and function perfectly and your set up crew is trained in the proper safe use of the equipment. Once a professional staging company has been selected and the planning group has communicated all of the needs, everyone can go back to focus on upcoming shows, knowing that the staging company will deliver a worry-free system for all performances in the upcoming years.

ABOUT THE AUTHORS: Rick Roe has twenty-six years of StageRight sales experience serving all divisions through the years representing the StageRight School and Church as Market Manager. Kip Weis joined the StageRight team in 2007 and is the Market Manager for the Performing Arts market. Kip brings a passion for theater and music that, combined with his product knowledge and experience, makes him a great resource for your venue's needs.

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Beyond the Desk

COLLABORATION FURNITURE FOR THE FUTURE

BY MIRA KORBER

Schools and universities have a superpower: the ability to shape how people think, learn, and interact with each other. In a hyperpolarized world, learning institutions have a responsibility to teach students how to come to consensus. This process starts as soon as students enter the classroom for kindergarten and follows them through their postsecondary years. Collaborative furniture, coupled with creative pedagogy, can lay the foundation for their future.

When designed well, collaborative spaces confer significant benefits to students. Collaboration can help schools improve student learning outcomes in the short-term and potentially develop human potential in the long-term.



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Benefits of Collaborative Learning Spaces

Furniture layout and classroom culture combine to facilitate collaboration. Intelligent classroom design benefits learners and teachers in the following ways:

- **Enhanced Communication:** Collaborative environments encourage conversation. These conversations help teachers assess skills and social-emotional learning. The “flipped classroom” pedagogy, where students consume course content outside of class hours and focus on project-based learning during class meetings, practically requires collaborative furniture in order to be effective.
- **Flexible and Agile Layouts:** The classroom is home to a panoply of activities: presentations, breakout sessions, group projects, and discussions, to name a few. Collaborative workspaces that include mobile furniture make it possible to seamlessly shift between uses.

- **Active Learning for all Styles:** Students often learn auditorily, visually, or kinesthetically. Collaborative workspaces enable educators to cater to each of their students’ unique preferences.
- **Increased Accessibility:** The physical layout and technological capabilities of learning spaces matter. Mobile furniture can facilitate ADA compliance, allowing classrooms to be rearranged and create easier navigation paths for wheelchair users. Tables with flipIT monitor mounts provide convenient access to visual and auditory aids, if needed.

How to Promote Collaborative Learning

While schools often say they value collaboration, fostering collaboration is more easily said than done. According to one study from the UK, 25% of student learning progression at the primary school level is attributable to the classroom design and learning environment. Given the potential positive or negative effect a space can have on students, educational institutions should endeavor to design environments that unlock collaboration.

- **Rethink the Layout:** According to the *Journal of Learning Spaces*, classroom layout significantly impacts how well students learn. In this study, the classroom had an open design with moveable tables and workstations. The ability to rearrange the classroom and form groups increased interaction between students and instructors, resulting in a greater sense of classroom community, enhanced student engagement, and more comfortable and frequent interactions. The study finds that the classroom’s open and flexible design “erased the line” between themselves, their instructor, and other students.
- **Intentionally Choose Furniture:** Collaborative furniture makes interactive workspaces possible. These pieces of furniture have the mobility, shape, and technology to fit any purpose. The University of Colorado showed that

students value classrooms with flexible layouts over rigid lecture halls that inhibit interaction. The research also stresses the importance of including a variety of functional furniture in collaborative spaces. For example, this research specifically mentions a mobile conference table and chairs set at different heights that users adapt to individual student's unique needs.

- Create a Comfortable Environment:** Physical comfort also impacts how people interact. For example, the quality of lighting affects productivity in positive or negative ways. According to the University of Mississippi, fluorescent lighting causes headaches and impairs visual performance. Each of these effects negatively impacts learners. Instead, natural light improves mood and cognitive function. Temperature also impacts mood. Rooms that are too hot

or too cold can make people irritable and uncomfortable. Institutions of higher education should ensure that every classroom is comfortable enough for the people using it.

Collaborative learning environments benefit from flexible spaces, various perspectives, adaptive furniture, and a comfortable environment. In many cases, the difference between engaging and isolating spaces is the choice of furniture.

The Role of Collaborative Grouping and Peer-to-Peer Learning

Collaborative grouping in the classroom is an instructional method that breaks students into small groups to learn from each other. Also called peer-to-peer learning, this method is one of the leading educational philosophies, according to researchers at George Washington University. Teachers can facilitate collaborative learning by:

Collaborative learning environments benefit from flexible spaces, various perspectives, adaptive furniture, and a comfortable environment. In many cases, the difference between engaging and isolating spaces is the choice of furniture.

continued on next page



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- Optimizing group sizes to allow for active discussions that involve all participants.
- Teaching active listening skills, such as eye contact, paraphrasing, and providing constructive feedback.
- Setting clear expectations and timelines that keep students focused on the activity's goals.
- Assigning roles to group members.
- Helping students get comfortable in a group by starting with a game or icebreaker.
- Evaluating each group separately from the other groups to give feedback on their specific dynamics.
- Differentiating instruction so that everyone succeeds.

Teachers facilitate peer-to-peer learning more easily when their classroom is set up to encourage group interactions. Having the right collaborative furniture helps.

How to Arrange Furniture for Classroom Collaboration

Arranging furniture in a classroom makes a big difference in how students learn. The following considerations are key to determining how to set up a collaborative classroom:

- **What age are the students?** All ages learn differently. Younger students might benefit from more collaborative workspaces. Older students might work better with technology integration. Understanding which setup works best for students is essential to creating a rich learning environment.
- **What is the size of the classroom?** One might assume classrooms with more space are easier to design. But any size room is easy to arrange with modular furniture. From computer labs to active learning environments, SMARTdesks can create the perfect furniture dynamics for any size classroom.

continued on next page

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- **What special needs do individual students have?** Some students might have special needs in their learning plan. Arranging the classroom should address the needs of different learning styles and accessibility for all.

Depending on the lesson or activity, the desk arrangement may need to be modified. Instructors should be open to experimenting with various setups:

- **Traditional Rows:** Desks are arranged in rows facing the front of the classroom. The teacher lectures using the display located at the front, enabling teachers to see the students. Students can raise their hands and are seen by the instructor. However, this arrangement is not ideal for collaboration between students.
- **Clusters/Groups:** Desks are grouped into small clusters facing each other, encouraging student-to-student collaboration. A cluster setup also allows for flexibility because students are easily move around the classroom.
- **U-Shaped:** Desks are arranged in a U-shape facing the front of the classroom. Typically, the teacher's desk is front-and-center in the room. Students collaborate with others more easily than in traditional rows.
- **Circle:** Desks are arranged in a circle, so students face each other, encouraging open discussion. Not all students will face the front, so lecturing with a whiteboard is less effective.
- **Semi-Circle:** Desks are arranged in a half-circle facing the front of the classroom. As with rows and groups, teachers can instruct students from the front. Similar to the U-shape, the semi-circle also encourages discussion.

Every layout has advantages and disadvantages, so educators should select one that fits the specific needs of their students and the activities they want to do in class. One study suggests that the best classroom layout should be left to the teachers because they know which arrangement is the most effective for their classes. Using SMARTdesks furniture designed for collaboration, spaces easily adapt to teachers' and students' needs.



ABOUT THE AUTHOR: Mira Korber serves as Chief of Strategy for SMARTdesks®. She is also the founder of a tutoring company and has advised EdTech companies on strategic product planning. She holds a Master's of Public Policy, with a focus in K-12 education, from Vanderbilt University's Peabody College. SMARTdesks® works together with K-12 and Higher Education clients to furnish learning spaces for in-person, hybrid, and remote learning. Learn more at <https://smartdesks.com>, where you can request integrated design services assistance for your project.



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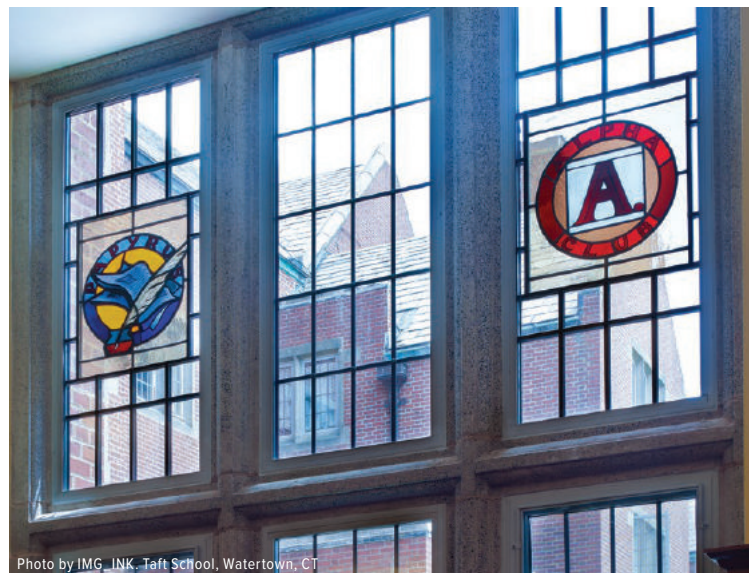


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Green Building

WITH STEEL WINDOWS AND DOORS

BY MATTHEW FULLER

Steel sets the standard for performance excellence. Steel windows and doors offer sustainable solutions to create healthy indoor educational environments while preserving our planet and natural resources. Steel windows and doors grace innumerable schools and universities across the United States. Their strength, longevity, and versatility make these products ideal for public and high-traffic areas.

Energy Efficiency and Thermal Performance

Steel has better natural insulating capability compared to other metals, conducting heat and cold at one-fifth the rate of aluminum. Aluminum products require a thermal break just to match the natural thermal performance of steel. The minimal frame dimensions of steel windows and doors further lesson thermal transfer by reducing surface exposure. Architects may still specify a thermal break despite the natural thermal properties of steel. It is important to understand that adding a typical thermal break into any metal frame results in dramatically weakening the material. This is because a traditional thermal break splits the frame into interior and exterior pieces and then reconnects them with a weaker insulating material. An advanced alternative solution called Thermal Evolution™ technology is available from Hope's Windows, Inc. that ensures that the solid steel profiles remain solid for the full depth of the frame, thus maintaining the structural integrity of the steel. These properties and features, together with modern advancements in glazing, result in exceptional thermal performance and condensation resistance for steel windows and doors.



Photo by IMG_INK. Taft School, Watertown, CT



Photo by IMG_INK. MIT School of Architecture + Planning, Cambridge, MA.

Natural Light Improves Student Academic Performance

In 2020, the Collaborative for High Performance Schools® (CHPS) adopted its updated U.S. CHPS 2.0 Criteria. These criteria of building design and construction strategies have been proven to yield high-performance schools which improve student learning and wellness outcomes. Both new construction and major modernization projects can receive CHPS-Verified recognition. The criteria are based on industry best practices, with proven techniques that reduce operating costs, achieve higher student performance, increase daily attendance, improve water and resource efficiency, and minimize the environmental impact of school facilities.

According to the CHPS criteria, “daylighting is fundamentally important to high performance design and should be the primary source of light in classrooms. Daylighting has a number of advantages, including improved occupant productivity, improved connection to the outdoors, improved health, energy savings, and quality of light.”

One of the ten concepts of the WELL Building Standard®—a science-based

roadmap for creating and certifying spaces that advance human health and well-being—is light. The standards promote enhanced daylight access to minimize disruption to the body’s circadian rhythm which, in turn, improves energy, mood, alertness, and cognition. Integrating natural light into indoor environments also provides individuals with a connection to outdoor spaces through window views.

The biological rhythm of circadian clock genes is stimulated and regulated by the wavelengths of light received by our eyes. Light at short wavelengths increases alertness by suppressing melatonin production. Unfortunately, most electric lighting offers much less light at this wavelength than daylight. Using the full spectrum of natural daylight to illuminate schools thus helps students’ bodies regulate melatonin and reinforce circadian wellness. Numerous studies have shown that classrooms optimized with natural daylight improve students’ academic performance.

Additionally, using natural interior daylight as a primary light source can significantly reduce energy consumption and help reduce

global carbon emissions. Connecting building occupants with the outdoors, reinforcing circadian rhythms, and reducing the use of electric lighting by introducing daylight into interior spaces are integral components to earning credits toward LEED® certification from the U.S. Green Building Council.

Steel windows are an ideal choice for school planners looking to design lighting that supports students’ alertness, mood, and cognitive function. The inherent strength of steel allows for substantially larger windows which allow more natural daylight to fill a room. Solid, hot-rolled steel also offers extremely narrow frame width to maximize glass area within the opening, as well as a much shallower frame depth, letting occupants see more when viewing at an angle than when viewing through windows with a deeper frame depth.

Interior steel doors and window walls can also be used to create common use and workspaces, such as computer labs and fitness rooms, allowing natural light to flow deeper into interior spaces. Interior glass divisions foster a larger and more open feeling by separating spaces without blocking natural light. They also serve to create unique focal points and can help to highlight collections, such as art galleries and library collections.

Ventilation

According to the U.S. Environmental Protection Agency, adequate outdoor air ventilation is shown to improve students’ ability to perform, raise test scores, and reduce airborne transmission of infection. EPA studies of exposure to air pollutants indicate that indoor levels of pollutants may be two to five times higher than outdoor levels. Good indoor air quality management includes the introduction and distribution of outdoor air.

For schools, major health risk factors include microbial concentrations in the air as well as dampness and mold in the building at large. Outdoor air ventilation is important for the maintenance of acceptable temperature and relative humidity. Adequate outdoor air alleviates dampness and mold conditions which can, in turn, relieve asthma symptoms and absenteeism.

continued on next page



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Using natural interior daylight as a primary light source can significantly reduce energy consumption and help reduce global carbon emissions. Connecting building occupants with the outdoors, reinforcing circadian rhythms, and reducing the use of electric lighting by introducing daylight into interior spaces are integral components to earning credits toward LEED® certification from the U.S. Green Building Council.

The WELL Building Standard® also advocates for using operable windows to increase the supply of high-quality outdoor air and promote a connection to the outdoor environment by encouraging building occupants to open windows when outdoor air quality is acceptable.

A significant lesson learned during the Covid-19 pandemic is that Air Changes per Hour (ACH) are extremely important to the health and wellbeing of building occupants. In a 30x30 foot classroom occupied by twenty-five students, the air should be replaced at least every fifteen minutes, which equals an ACH of 4. Simply opening windows is an easy way to improve ventilation. Researchers at Harvard University have found that opening the windows just six inches can result in an ACH of 5 or more in a room.

The versatility of steel offers a variety of window operating types such as casement, sliding, and awning windows, as well

as human safety features well-suited to classroom applications. Despite the stiff ruggedness often associated with steel, steel windows offer a surprisingly easy interaction, with smooth, graceful movement at the touch of a finger. Moreover, steel windows and doors will not rack or distort with age, and hardware will not loosen over time.

**Environmental Responsibility/
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Steel windows and doors are energy efficient and impervious to air and water infiltration, crafted from recycled steel, and finished with environmentally-friendly coatings. These strong and extremely durable windows and doors achieve unparalleled life cycle value and assist building owners and architects seeking LEED® certification from the U.S. Green Building Council.

Additionally, steel is the most recycled material in the United States. Each year, the

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steel industry saves enough energy through recycling to power eighteen million homes—one-fifth of the nation's households. Campus decision makers can conserve natural resources by choosing high-quality steel windows and doors made with solid, hot-rolled frame profiles that are 100% recycled steel.

The strength and durability of solid, hot-rolled steel windows and doors consistently outperform wood, aluminum, and vinyl products. With their proven ability to last for a century or longer, steel windows and doors provide an unparalleled life cycle value and contribution to campus sustainability.

Steel windows and doors also have eco-friendly coatings. The most advanced pretreatment and finishing processes available for steel are lead-free, contain zero hazardous air pollutants (HAPs), and have ultra-low volatile organic compounds (VOC), resulting in an earth-friendly product with unlimited color options and long-term protection against corrosion and abrasion. Steel

finishing processes exceed the most rigorous testing standards and are carefully scrutinized to ensure products will perform, both aesthetically and functionally, for decades to come and with extremely low maintenance requirements.

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Hope's custom crafted windows and doors set the standard for performance excellence that no other steel manufacturer has equaled. Hope's provides peace of mind, with products that are tested and proven to deliver protection solution for inclement weather, harsh and extreme environments, and even dangerous situations caused by people or natural forces.

Hope's prides itself on its long-standing commitment to testing and certification, subjecting its products to more third-party testing and certifications than any other steel window and door manufacturer. The process of exceeding both rigorous, independent

testing and customer expectations begins with the engineering and design of Hope's products—expertise derived from more than one hundred years of experience.

Hope's provides custom solutions to satisfy local, state, and national building code requirements—including Air, Water, Structural, Thermal, Hurricane/Impact Resistance, Fire Resistance, Forced Entry Security, and ADA and egress compliance—for any building project.



ABOUT THE AUTHOR: Matthew Fuller is the National Sales Manager and LEED Green Associate at

Hope's Windows, Inc., the largest domestic manufacturer of luxury steel and bronze windows and doors. Matt has worked in the custom steel window and door industry for fifteen years.

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A Different Type of Success on the Court

GYM EQUIPMENT INSTALLATION

BY DAVE SMITH

For campus planners who are considering a new sports facility or similar building project, this article can help keep the project on budget, avoid embarrassing delays being reported in the local news, and help to propel the school's dream through to reality.

This article offers an overview of the little-known installation process for a typical gymnasium construction or renovation project. In addition to the design and financing teams, planners must develop a relationship with a third-party contractor who partners with an equipment manufacturer; developing these relationships will be time well invested.

The first step the local installer will complete is called a field check. Accurate field checks are critical to a successful project. An incomplete or inaccurate field check will always result in problems and additional costs and delays. Planners should share their knowledge of the facility with the design professionals to prevent surprises. The installer should note any unusual situations such as conduit on beams, sprinkler lines, hidden beams, and so on.

When the time comes for the actual installation, the installer will unload and count the equipment when they arrive at site. If the

equipment was delivered early, on-campus personnel can prevent delays by inspecting for damage and comparing the delivered items to the delivery receipt to identify lost items. The driver should wait to allow recipients to note discrepancies or potential damage on the paperwork. If missing or damaged items are reported after the first day onsite, it is often too late for the manufacturer to provide custom components on a rush schedule, and expedited shipping costs and delayed installations can be expensive.

Before beginning installation, the area must be clean and the facility protected from damage with plastic, OSB, Masonite, or other material. Such protection is especially important if the installer is working over a finished floor. The installer should have included this cost in the estimate unless the floor installation gets moved up earlier than when the gym equipment is installed.

The most crucial step in any installation is the initial layout. It is critical that the

entire gym be laid out to find any possible discrepancies. This layout also includes a trip to the job trailer and a review with the superintendent to make sure that all of the latest design changes have been incorporated into the installation drawings supplied by the manufacturer.

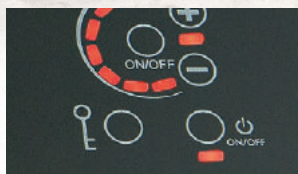
Safety is important at every step, but especially before any work done above floor level. For example, on-campus personnel should require hard hats for everyone onsite and have extra available for visitors. Safety lines must be used. Scaffolding, if used, must be safety pinned at all times. Scaffolding should never be moved with someone on it. In the long run, it is always faster to do the job safely. At most job sites, the general contractor will have very specific safety requirements that all onsite subcontractors must follow.

All ceiling-mounted units should always be attached where and how the drawings show. The installers should not try to “redesign”

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TOOLBOX TIP TEN MISTAKES TO AVOID IN GYM DESIGN

Careful planning, measuring, and communication can keep the project under budget. We've compiled a list of issues to watch out for when designing and constructing a gym:

1. Not planning for future expansions
2. Not considering flexible spaces to boost revenue
3. Cutting corners on equipment to save money
4. Not designing the building with adequate support to hang goals
5. Ignoring minimum ceiling height requirements for ceiling and wall suspended systems
6. Ordering too late
7. Skipping shipment inspection
8. Over- or under-communicating with the manufacturer
9. Ignoring expert advice
10. Not enjoying the final result

a unit without first consulting the manufacturer. For wall mounted units, the installer will make the final decision on attachment of the unit to the wall. There are significant safety concerns to players and spectators with installation of ceiling and wall suspended structures, so this is an area to ask a lot of questions about and to verify that the plans meet an engineer's approval. Overhead safety belts are recommended for ceiling suspended sports equipment, wrestling mats, batting cages, and wall-mounted basketball systems, especially when such devices are installed over bleachers.

Before the installer cleans up to go to their next project, everyone involved in the project should schedule a complete visual inspection of all equipment for plumb, level, finish quality, etc., as well as a test of final operation and setting of limit switches. All staff should be trained to operate the new equipment safely. A final meeting with the general contractor is recommended before signing off on the job.

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Ensuring an Accurate Quote

Take-off sheets note attachment heights, spacing, and direction the structural members run in relationship to backstop or curtain systems. This information gives the manufacturer a better idea of how equipment will be installed. If a project doesn't have prints or specs but a quote is needed, dimension sketches and a list of requested products can be submitted. Specific information needed includes, but is not limited to, ceiling height, truss and beam spacing, the overall size of the room, notes on any obstructions (lights, HVAC, sprinkler systems, etc.), and if there are product preferences such as folding or stationary basketball goal systems.

The Importance of Field Checks

Sometimes addendums will occur in the design or construction process that manufacturers are not made aware of, and these changes can interfere with the installation of gym equipment, though such changes to the plan are usually discovered during a field

check. The only information a gym equipment manufacturer has before finalizing a design and beginning production for any project is from the field check process performed by the local manufacturer's representative or installer; the field check matches the actual field conditions to the originally quoted design. Completing an accurate field check will help avoid potential costly delays. If any obstructions are witnessed that will interfere with the installation of the goals, campus planners should work with the contractor and manufacturer to resolve the issues before approving the equipment drawings.

Checklist for Gymnasium Field Checks

- Confirm the room size
- Confirm the location of the goals in that room
- Confirm attachment height
- Confirm truss/support spacing
- Confirm that there are no obstructions on the trusses to be mounted to

- Confirm that all lighting is out of the way
- Confirm that HVAC will not interfere
- Confirm the flooring thickness with prints or contractors
- Confirm that there are no PA speakers or other items affecting the goal location
- Review the provided prints carefully and verify any additional information requested



ABOUT THE AUTHOR: Dave Smith joined Instilled Products Incorporated in 1986 after he graduated from Ball State University, where he studied engineering and architecture. He managed plant operations and order fulfillment until Bison Inc. acquired IPI in 2012 and relocated to Lincoln, Nebraska. As a Project Team Director who manages a team of designers and technical service staff, Smith plays a major role in IPI's success. Smith is also an avid bowler with three hundred games to his credit.

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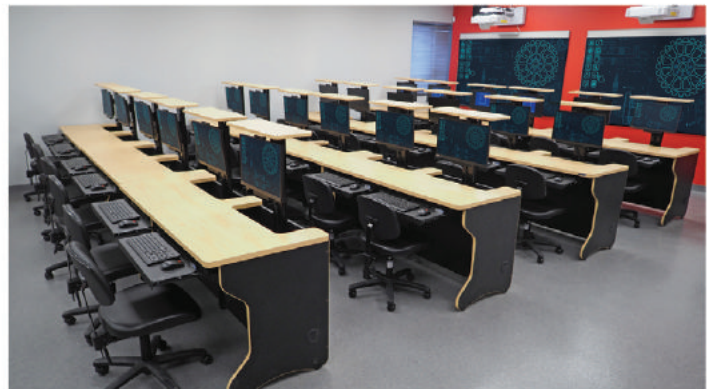
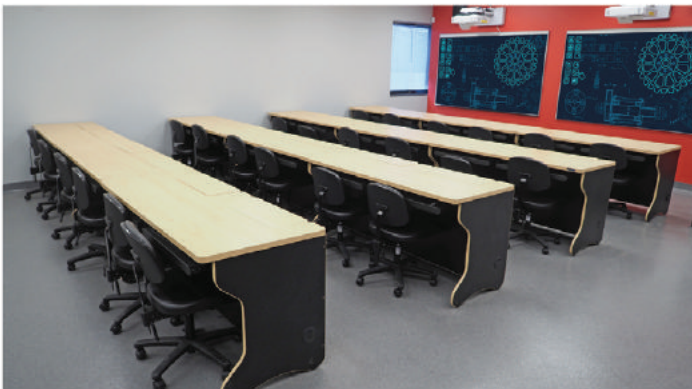
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