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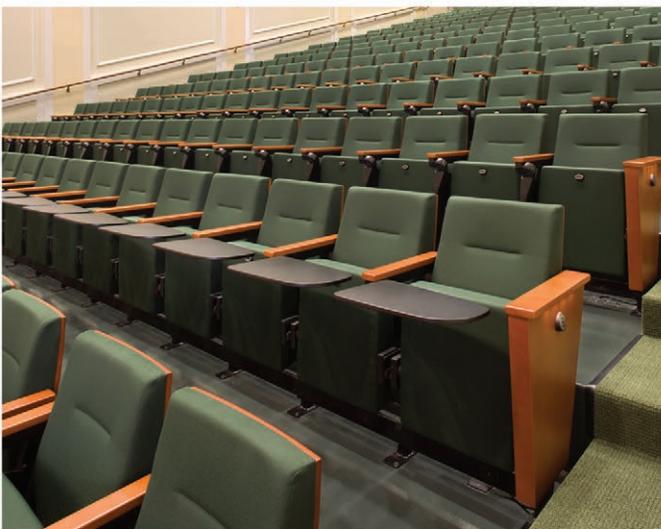
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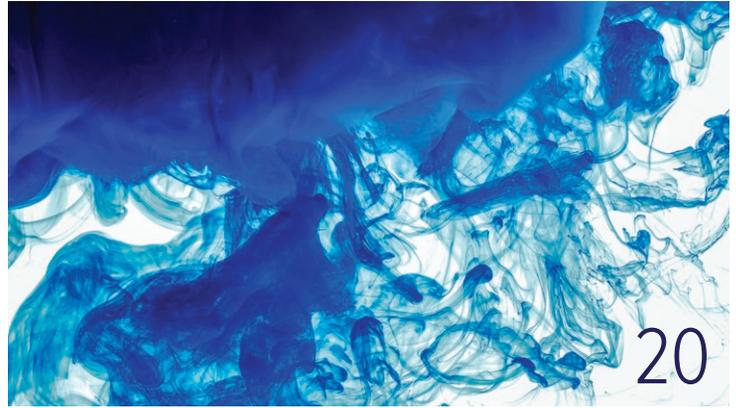
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The Solution to Pollution is Dilution

When I first started in the building automation industry, I had a mentor who would often say, “The solution to pollution is dilution.” Seventeen years, and many roles, later, it’s a mantra that I’ve often repeated, but since COVID came into the picture, it’s been something that I’ve been thinking about much more frequently.



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Lighting Technologies: Enhancing Aesthetics, Functionality, and Sustainability on Campus

A devoted cinephile likely knows Charles Laughton’s riveting and unforgettable *The Night of the Hunter* (1955), a film that manages to defy common sense by combining seemingly incompatible genres. The movie is similar to neo-noir inspired by German expressionism, with elements of the fairytale, the pastoral, and the musical.

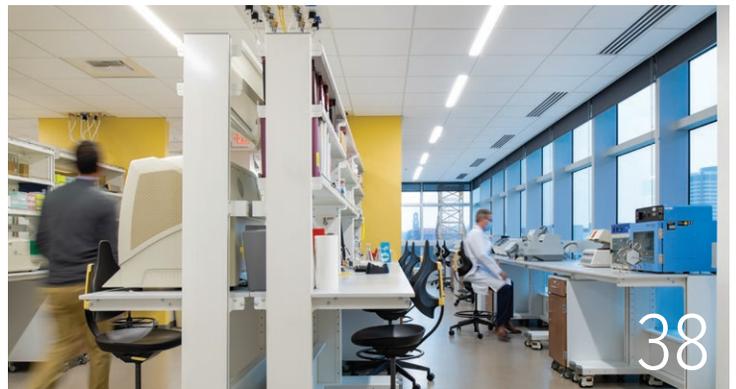


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Cover and above photo courtesy Syracuse University

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EDITOR'S LETTER



Ed Bauer

Publisher/Editor-in-Chief
ed@pupnmag.com

Lawrence Provenzano
Director of Client Development

Hilary Moreno
Creative Director

Lisa Gibbs, EdD
Cynthia Mwenja, PhD
Staff Writers

Kelsey Baska
Jesse Shoemaker
David Vinson, PhD
Contributing Writers

Cassidy Clevenger
Circulation
circulation@pupnmag.com

As Thanksgiving approaches, many of us will be taking time to gather with friends and loved ones for the holiday. This year, Thanksgiving is particularly special because it is the first opportunity in a very long for many of us to gather and celebrate together with those we love.

This past year has been challenging, but still there are many things I have to be thankful for. Some of you know the physical issues my daughter has had; I am thankful that she is on the road to recovery and that we will once again have a Thanksgiving to be with her. I am glad that this year we will spend time with my parents and get to share a meal and laughter as we partake in holiday traditions. Blessed is how I feel when I realize that—while he may be far away—my son is healthy and building a life filled with love with his wife and their two dogs.

I'm feeling grateful for friends across the country who have reached out to me this year when I needed it most, even when they might not have known why. I'm thankful for being able to enjoy physical activities and exercise, both of which are helping me to be able to enjoy getting older. I'm thankful for the realization that, for me, age really is just a number when I take care of the gifts God has given.

I'm happy that I am blessed to work with some of the most beautiful people on earth every day. They make it a joy to come to the office, excited to hear their input and the passion they bring to our projects. Finally—for this small letter—I'm amazed at the gift of second chances, chances to reconnect with loved ones from whom I had grown apart. I'm humbled by grace given to me for opportunities to rebuild neglected relationships that needed my time and focus to heal and renew. These have been some of my biggest blessings over 2021, and I look forward to them growing and strengthening in 2022.

If you are able to see your loved ones during this month's holiday, as you all gather together, I hope you also know that we here at PUPN are thankful for the time you spend with us each month and letting us know what we can do to help you in your mission of providing first-rate learning halls and facilities. Before we know it, Christmas and other winter holidays will be here; think of the joy we can all spread and what a blessing the coming holiday season will be to all of us—

Ed Bauer

Publisher/Editor-in-Chief
Private University Products and News Magazine
ed@pupnmag.com



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James Haywood Rolling, Jr.



Kendall R. Phillips

"Social Justice, Equity, and Inclusion" with the Lender Center at Syracuse University

by Cynthia Mwenja, PhD

Kendall R. Phillips and James Haywood Rolling, Jr, current co-directors of the Lender Center for Social Justice at Syracuse University, guide the Center's work via its three key principles, stated on the Center's website as pursuing "proactive, innovative, and interdisciplinary approaches in issues related to social justice, equity, and inclusion."

The two hold other titles, as well; Rolling is Dual Professor of Art Education and Teaching and Leadership; he also serves as chair of the Arts Education programs at Syracuse and is President of the National Art Education Association (NAEA); Phillips is Professor of Communication and Rhetorical Studies in Syracuse's College of Visual and Performing Arts, where he previously served as department chair and associate dean. Both co-directors draw on their particular skills and disciplinary approaches in guiding the Center's work.

Development

As Phillips reports, the vision for the Lender Center was developed through a multi-year series of conversations in which a core group of professors worked with founders Marvin and Helaine Lender to develop a social justice initiative specific to Syracuse University. Phillips says that Syracuse is a great place for the Center to be because the city is "large enough to have problems but small enough that the Center can engage" in piloting innovative projects in collaboration with local stakeholders.

After considering a variety of existing models and carefully exploring potential directions that the Center could take, the founding co-directors decided to structure the organization to support interdisciplinary teams of faculty and student Fellows to tackle local issues of inequity in innovative ways. Each year, the co-directors and advisory board choose a faculty Fellow to build on a project that the faculty member has already been involved with in some capacity. After the Center opened in 2019, it has consistently received "a substantial number of outstanding applications" for both faculty and student Fellowship positions, Phillips says. Through the Fellowship, the Lender Center helps faculty Fellows to build upon community-engaged research inquiries they have already begun; the Center adds to their work by offering material support and assembling an interdisciplinary team of student Fellows who enhance and reinforce the project. Faculty and student Fellows work together for two-year terms, culminating in a symposium in which they share their projects and results.



Interdisciplinary

According to Phillips, who was part of the group who planned the Center, interdisciplinarity is a core value at Syracuse, so this principle formed a natural element of the plan. As part of this commitment to being truly interdisciplinary, one of the co-directors will always be from the School of Education—where the Center is housed—while the other must always be from another school in the university. As a professor in two colleges, Rolling's expertise adds to interdisciplinary nature of the Lender Center's work.

While all Lender Center projects are interdisciplinary, the one led by Seyeon Lee, assistant professor and George Miller Quasi Endowed Professor in the School of Design, offers a case in point. As an architect, she had previously designed a community women's center. Her Lender Center project, which connects questions of design to social, political, justice, access, and equity issues, asks how the community women's center can be used as a hub connecting various parts of the community.

As Lee states in the project's press release, "There is a ton of community space that is underutilized, a lot of pockets of opportunities that are lost, and that's where I would look to engage with the students with their different perspectives and backgrounds." Phillips says the team working with Lee has explored how people from a variety of backgrounds—and with different cultural expectations—access wellness services of all kinds.

Proactive

Phillips says that the planning group valued proactivity as a principle, but they had a tough time "getting their heads around" how it could drive the Center's work. While Phillips was invited to be part of the group developing the Center because his research deals with the concept of public memory—"whose story gets told and what happens after conflict," as he says—the planning group wanted to create a proactive entity that did more than provide a space for people to react after injustices had already occurred.

Lee states, "There is a ton of community space that is underutilized, a lot of pockets of opportunities that are lost, and that's where I would look to engage with the students with their different perspectives and backgrounds." Phillips says the team working with Lee has explored how people from a variety of backgrounds—and with different cultural expectations—access wellness services of all kinds.

One Lender Center project highlighting such proactive work is a local food justice initiative proposed by Evan Weissman, associate professor of food studies and nutrition in the Falk College. After he unexpectedly passed away, “the Lender Center chose Jonnell Robinson to carry on the fellowship in Weissman’s name,” as the website states. This project, exploring Food Justice within the Syracuse-Onondaga Food Systems Alliance, “examined if the food systems in Syracuse were meeting the needs of the community, particularly during the COVID-19 pandemic.” Robinson, who was already engaged in community collaborations “to better understand and address social and economic disparities,” is leading a team of students in partnership with the Syracuse Onondaga Food Systems Alliance, a newly created food policy council to “conduct participatory action research to promote community-driven food policies and practices, while studying the strengths and weaknesses of the local food system.” They hope “to

provide a model for how local food policy councils can address structural inequalities in food systems.” Phillips says that this project, showing the relationship between location, food, and people—immigrant, refugee, and native—demonstrates how food systems are justice issues and how food can be seen from a social justice perspective.

Rolling has always aligned with this value of proactivity; in his work as an arts educator, or “creativity educator,” as he says, he wants to help young people see their agency as creative beings—as people who can make change. Rolling promotes the idea that “To make change, people must see themselves as changemakers.” He is justifiably proud of the work he has inspired at the NAEA as it makes “real strides” toward becoming an anti-racist organization; these changes, he notes, are intended not only to affect the professional field, but also to foster the development of diverse learners who must be offered the same access as anyone else to enter the arts and design professions; his goal is aligned with the

mission of NAEA to more fully shape human potential through creative agency.

Innovative

Phillips says that “a spirit of innovation” is not necessarily the norm for social justice work, but the group wanted to find ways to address old problems in new ways. They also wanted to create a model that was different from existing social justice centers, many of which focus on one or two specific social justice issues or view issues through a single lens. The planning group decided to provide space for working on a multiplicity of social justice concerns rather than privileging any particular one.

The inaugural Lender Center project exemplifies such innovation. The first Lender Center Fellow, Casarae Gibson-Abdul-Ghani, assistant professor of African American Literature and Studies in the College of Arts and Sciences, led a digital humanities project “aimed at utilizing social media platforms as a way of uncovering social justice trends.” As she stated when the project began, “The



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ways in which we teach our students in the Information Age about social justice and how they must be equipped to challenge messages of inequality is vital.” This inquiry, connecting digital humanities work to issues of social justice, set the innovative tone for all subsequent Lender Center projects.

Rolling brings experience innovating from the NAEA, where he served as architect and inaugural chair of the organization’s new Equity, Diversity, and Inclusion Commission. His open letter to arts educators on constructing an anti-racist agenda, written following George Floyd’s murder, had a ripple

effect within the organization and to other arts fields, influencing the NAEA and others to fully embrace an anti-racist agenda. As the son of a practicing artist, Rolling’s path to working with issues of equity is longstanding—knowing firsthand how hard it was and is for people to get into the field has driven him to help more people become contributors; these experiences attract him to the work of the Lender Center. His commitment to innovation stems from his lived experiences; as he says, “this work is personal to me, not just professional.”

Lender Center Conversations

The initiatives that are being driven by the Fellows examine big issues proactively, asking questions such as “How should food justice look?” and “How should health and wellness justice look?” The co-directors, however, realized that the Center couldn’t ignore ongoing injustices; it “doesn’t exist in a vacuum,” as Phillips says. To be more responsive to current events, they developed “The Lender Conversations,” which are events headed by one of the co-directors. Since each co-director brings “something different to the table, each co-director organizes a Conversation” Rolling says.

The first of these conversations was a symposium at the National Press Club called “Difficult Conversations,” which is viewable as “Addressing ‘Difficult’ Aspects of U.S. History” on CSPAN. Phillips says that scholars and practitioners who focus on a wide array of injustices—including the Holocaust and lynching to experiences of native peoples and disabled individuals, among others—came together to have a conversation about how American society should deal with these memories of injustice. Phillips reports “powerful cross-talk moments, such as when a rap artist was discussing intersectionality with a disability rights activist.”

The second Lender Center Conversation, “Policed Bodies: A Community Conversation on Race, Disability, and Justice,” was a symposium that drew experts and activists together to examine “race, disability, and justice in the policing of bodies in communities and schools,” as the website states. Phillips says that almost nine hundred people logged in to take part in the day-and-a-half symposium, and participants were keenly aware of the impact policing can have at the “very local” level. The Syracuse University News article covering the event quotes Marcelle Haddix, founding co-director of the Center: “Conversations about race, disability and justice in the policing of communities and schools are happening across

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Rolling says, “Change-makers are not just creative in their own work, they make change in terms of society, as well.” Rolling knows that artists signify that “their identities, their experiences, their culture, their family are all of worth, of value” when they share their creations that have been made through the lens of personal experience.

the country. Consistent with the Lender Center’s mission, the intention is to create a space where national experts, community activists and local stakeholders have the opportunity for critical dialogue on citizen-led reform of policing and public safety.”

The next Lender Center Conversation, happening this month, “Creative Activity as a Human Right,” is being led by Rolling, who is the Center’s newest co-director. As Rolling says, “Change-makers are not just creative in their own work, they make change in terms of society, as well.” Rolling knows that artists signify that “their identities, their experiences, their culture, their family are all of worth, of value” when they share their creations that have been made through the lens of personal experience. For these reasons, Rolling says, artists are “excellent traffickers in the realm of social justice.” For him, art is “an act of identity—ethnic, personal, cultural, national identity.” These concerns, he notes, are “not narrow; in the full array of what artists have done, we portray human experience.” To fulfill the demands of social justice, then, everyone’s experience must be represented in art so that we can share the “full human story.” The November 11th

virtual event will “expand notions of how we view art,” making the point that “art is much broader than many people understand in terms of what it’s intended to do in the world,” says Rolling. The event will feature “interdisciplinary artists, activists and educators with expertise in the arts, humanities and social sciences joining together to examine what it might mean to rethink creativity as a universal and inalienable human right, a remedy for complicated histories of inhumanity and carelessness, and a change-making, emancipatory form of social intelligence.” The event is free to attend, and registration is required at this link <https://lendercenter.syr.edu/programs-events/>.

In balancing faculty-centered, proactive Fellowship projects with Lender Center Conversations that are responsive to serious social justice issues as they gain public attention in the wake of current events, the Lender Center is sustaining the innovative, proactive, and interdisciplinary model the planners envisioned.



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

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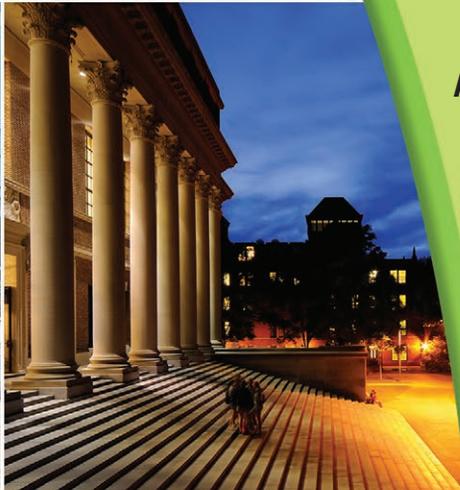
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SUSTAINABILITY AND GREEN INITIATIVES

Green Initiatives: Complement LEED Certified Buildings with these Eco-friendly Practices

by Lisa Gibbs, Ed D.

The Industrial Revolution, which spans from the 1760s through the early 1900s, brought major technological changes to the planet. The shift from small-scale farming, handmade goods, and travel by horse and foot to mass food production, manufacturing, and locomotives greatly increased accessibility for products and ease of movement around the vast United States and across the globe. However, environmental pollution and disruptions of the landscape are continued nasty side effects. Coal burning factories, steam engines, and internal combustion cars produced dense smog in many early 20th century cities and continue to pollute today. Railways, dirt or cobblestone roads, and city construction have resulted in the loss of forests, prairies, and other natural landscapes.

People concerned with pollution, nature conservation, and wildlife protection formed groups to bring awareness to the issues caused by the Industrial Revolution. In 1905, the United States established the US Forest Service and began designating national wilderness areas. “Green” political movements became more numerous in the 1950s and 60s, and in 1963 the Clean Air Act became law. The act empowered federal and state agencies to research and regulate air pollution. Several later updates to the act—along with the founding legislation of the Environmental Protection Agency—resulted in comprehensive air-quality standards for the U.S.; National emissions dropped 63% between 1980 and 2015 thanks to these policies.

Moving into the 21st century, efforts toward cleaner air, water, and land conservation have become more and more prolific. Private colleges and universities are now microcosms of initiatives that are successful in reducing the carbon footprint of campuses across the country. One major effort, LEED certification, has become the gold standard for new construction and renovations; however, there are other changes campuses have made that complement this eco-friendly construction.

Wind-Generated Electricity

Naropa University in Boulder, Colorado is committed to using 100% renewable energy. Much of that energy is harnessed from wind turbines. Xcel Energy Inc., a utility holding company operating in Colorado and other Midwest states, allows customers to voluntarily choose how much of their power is received from wind energy. According to the company website, Windsource subscriptions are available in 100kilowatt-hour blocks for a small additional cost. Since 1998, Naropa has been purchasing these Renewable Energy Credits (RECs) to power the campus, supporting wind energy development and production.

Geothermal Energy

Geothermal energy techniques tap into the reservoirs of hot water found at various depths below the surface of the Earth. This energy source produces

consistent power around the clock, and the closed-loop plants emit no greenhouse gases. They use less land than coal, wind, or solar energy plants, and the rate of energy extraction can be balanced with a reservoir's natural flow. Grinnell College in Grinnell, Iowa, drilled wells 120 feet in order to harness the steam and extremely hot water now used to heat and cool the Environmental Education Center in the Conrad Environmental Research Area. The campus currently has four geothermal systems in place and plans to eventually heat and cool the entire campus in this manner, replacing the boiler and chiller plants that rely on fossil fuel energy.

Zero-Landfill

John Brown University (JBU) in Siloam Springs, Arkansas, became and continues to be the first and only zero-landfill campus in Arkansas. In 2012, the campus put in place numerous methods of keeping waste out of landfills. As their website states, "45% of JBUs waste is recycled, and the rest is compacted and incinerated." All dumpsters were removed from campus and replaced with recycling

bins and trash cans in nearly every campus space, resulting in nearly 100% of classroom and office paper, cardboard, and most plastics being recycled. The Salvation Army arrives during move-out days to collect reusable items discarded by students. Compacted non-food items are incinerated in a power plant that does not release harmful emissions. Food waste is taken to a nearby zoo, and kitchen grease is converted to biodiesel, then used to power landscaping equipment.

JBU partners with off-campus entities to recycle as much as possible. The City of Siloam Springs receives paper, cardboard, most plastics, glass, and pallets in exchange for the containers used on campus to collect such materials. Salvage metal is sold to metal recycling companies in the city. Plastic bags are taken to grocery stores that recycle used bags. Electronic waste is recycled by eSCO, a "full-service electronics recycling and asset recovery firm with a zero electronic waste landfill policy." These initiatives have resulted in hundreds of thousands of dollars in savings for the campus in addition to the positive effects on the environment.

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At Kenyon College in Gambier, Ohio, nearly 45% of food served in the dining hall is grown within a 40-mile radius of the campus. This return to locally grown food, as opposed to the highly processed food that came from the Industrial Revolution, improves access to healthy, organic options and connects the campus with the local economy and community.

Agriculture

At Kenyon College in Gambier, Ohio, nearly 45% of food served in the dining hall is grown within a 40-mile radius of the campus. This return to locally grown food, as opposed to the highly processed food that came from the Industrial Revolution, improves access to healthy, organic options and connects the campus with the local economy and community. In addition, the campus includes Kenyon Farm, a 10-acre plot where students manage the care of farm animals and the growing and harvesting of crops. Students can live in the house on the farm and complete coursework while also tending to the daily work it takes to run a successful farm. Coursework from various disciplines—biology, economics, and environmental studies—uses the farm to explore topics such as conservation, resource allocation, and permaculture.

Aldo Leopold, who in 1924 was instrumental in the designation of Gila National Forest as the first national wilderness area

in the US, encouraged people to be citizens rather than conquerors of the land. The efforts outlined above by these institutions demonstrate a return to this type of human stewardship of the environment. Additional practices that complement LEED certified construction include composting, using green cleaning products, bicycles for transportation, low-flow shower heads, motion-sensor lights, and water bottle filling stations. The eco-friendly changes taking place in the microcosms of higher education demonstrate that the larger community can adopt and participate in such practices.



ABOUT THE AUTHOR: PUPN staff writer Lisa Gibbs earned her Ed.D. in Higher Education Administration in 2018. She is an advocate for arts, particularly dance, in education and for increasing the financial well-being of artists through financial education.



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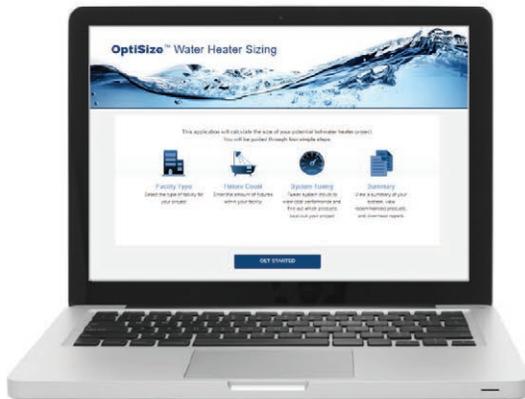
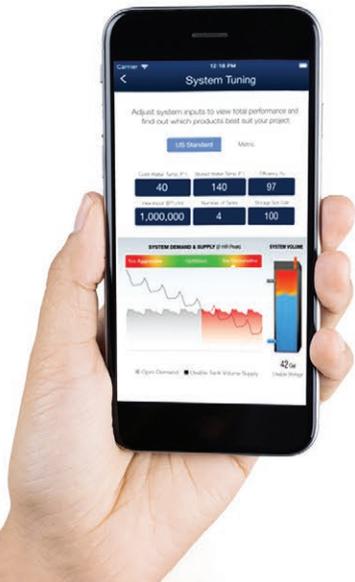


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The background of the entire page is a white surface covered with intricate, organic patterns of blue ink. The ink has been splattered and then allowed to flow and spread, creating a complex, web-like structure of fine lines and larger, more solid-looking areas. The colors range from a deep, dark blue to a very light, almost white blue, giving the impression of a microscopic view of a fluid or a complex network of connections. The overall effect is one of dynamic movement and organic growth.

**THE SOLUTION
TO POLLUTION
IS DILUTION**

by Jesse Shoemaker

The Solution to Pollution is Dilution

When I first started in the building automation industry, I had a mentor who would often say, “The solution to pollution is dilution.” Seventeen years, and many roles, later, it’s a mantra that I’ve often repeated, but since COVID came into the picture, it’s been something that I’ve been thinking about much more frequently.

In my industry, we mostly deal with monitoring and controlling heating, ventilation, and air conditioning (HVAC). For those who have ever wondered if the air they’re breathing is clean, or if enough fresh air is coming into an indoor space, or whether they have too much CO2 in their spaces, we engineer and manufacture the sensors that answer those questions and the controllers that make necessary adjustments when something is out of spec.

Fresh Air Has Always Been Important

Fresh air has always been important, but it’s rarely been taken seriously, and incorporating

the necessary tools to monitor and control our built spaces has historically been among the first things to be discarded to cut costs. For example, after the energy crisis in the mid-1970s, national conservation measures were put into place which called for a reduction in ventilation to five cubic feet of air per minute (CFM) per person—a reduction of 66% from previous standards. Unfortunately, many buildings are still set at that level due to cost. However, the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends a “minimum ventilation rate of 15 CFM per person in residential buildings in order to provide indoor air quality (IAQ) that is acceptable to human occupants and that minimizes adverse health effects.”

Ventilation—defined as the rate of indoor air exchanges with fresh, conditioned outside air—has been recognized as the first line of defense for healthy buildings. Further, smart infrastructure and high-performing building guidelines stipulate that the accurate

measurement of outdoor airflow rates is a fundamental component of building design.

Why Airflow Matters

One pressing reason airflow matters is, obviously, COVID. However, COVID is not the only illness that impacts wellness, nor is it the only danger that buildings and their occupants face. For a population that spends most of its time in buildings, bringing fresh outside air inside is the most efficient and systematic way to improve the quality of the air people breathe. According to the EPA, Americans, on average, spend approximately 90% of their time indoors, where the concentrations of some pollutants are often two to five times higher than typical outdoor concentrations. Pollutants can be combustion byproducts, allergens, biological agents such as mold, pesticides, lead, asbestos, ozone, or other volatile organic compounds that derive from a variety of sources. However, it is important to note that most pollutants affecting IAQ come from sources inside buildings.



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Insufficient Airflow

How can people know if the buildings they occupy are getting the proper amount of outside air? Buildings with insufficient levels of airflow may have occupants who complain of frequent headaches, frequent fatigue, or who feel more irritated than normal. These are all symptoms of building related illness (BRI) or sick building syndrome (SBS).

In the United States, it is estimated that poor air quality results in \$150 billion of illness-related costs per year, and \$93 billion, or 62% of those costs, represents lost productivity from symptoms associated with SBS. It's important to note that those numbers are all pre-COVID. The cost of poor ventilation is skyrocketing, and that will not slowdown anytime soon.

In fact, because fresh air has such significant health benefits, ASHRAE, CDC, EPA, WHO, and others have identified ventilation as a cornerstone in any IAQ monitoring and control strategy. That's because it has been demonstrated that occupant productivity and cognitive function can improve 8-11% by improving IAQ.

Current Practices

Drawing and conditioning outside air for heating, cooling, and ventilation is common for any building, and the need for proper ventilation of buildings is not new. Over the last two years, however, we have heard of many instances where outside air dampers were either disconnected or boarded over, which may not have come to light without the recent focus on IAQ. In this way, the COVID pandemic has shone a spotlight on the implications of poor IAQ.

And until al fresco schools, offices, and storefronts become a widespread movement, it's safe to expect that the amount of time spent indoors is not likely to change anytime soon. So, outside airflow will remain critical to providing safe, productive, and energy efficient indoor environments.

Challenges

There are numerous challenges to measuring ventilation rates, or airflow measurements. First, most buildings are not designed with outdoor airflow measurement in-mind, making it difficult to accurately determine the amount of air entering a building. Further, traditional technology is heavily affected by the weather. Wind gusts, low air velocities, temperature and humidity variations, airborne particulate matter such as dust, dirt, pollen, waste, and dampers, bends, or restrictions that affect airflow—all common occurrences—will

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budgetary challenges



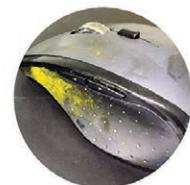
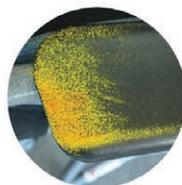
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negatively impact airflow measurement in traditional technology. Energy efficiency schemes, such as what we saw in the 70s, can also affect ventilation rates. Demand control ventilation (DCV) schemes seek to regulate airflow as a function of occupants in a given space, often using indoor CO₂ levels as a proxy for head counts, which will obviously impact ventilation rate.

Delivering accurate, repeatable measurements in any environmental condition is critical to establishing a proper ventilation strategy, whether that includes DCV, minimum airflow or damper position, or optimizing conditions for occupant comfort.

Traditional Technologies

There are numerous airflow measurement technologies available, but few that can produce repeatable, accurate measurements for all types of equipment. Nearly all measurement devices have extremely restrictive installation parameters, which can limit the equipment that traditional devices may be applied to.

Differential pressure, which uses pitot tube, is an accepted standard for measuring airflow, but it is not recommended for ducted systems that have bends or restrictions or for measuring low velocities.

Thermal dispersion sensors have proven to be accurate in measuring low-velocity airflow, but airstream pollutants like dirt, dust, feathers, cobwebs, or animal waste significantly impact performance. Thermal dispersion sensors are also affected by bends and restrictions in ductwork. Additionally, thermal dispersion sensors require regular maintenance and factory calibration for any repair.

Conditioned orifice plates are effective but may require significant modification to mechanical systems, resulting in the highest installed cost, and they are not guaranteed to be a fit for all equipment. Additionally, when measuring low velocities, a conditioned orifice must artificially amplify the differential pressure across the orifice, which compromises resolution and accuracy.

Solutions

The most recent innovation for measuring outside airflow is a patented technology which uses a characterized damper method. This method is not impacted by the weather, low air velocities, temperature, ductwork bends, turbulent airflow, or any of the other traditional pitfalls in the airflow measurement space.

Given that measurements are based on measured damper performance, this approach can also be applied to nearly any type of

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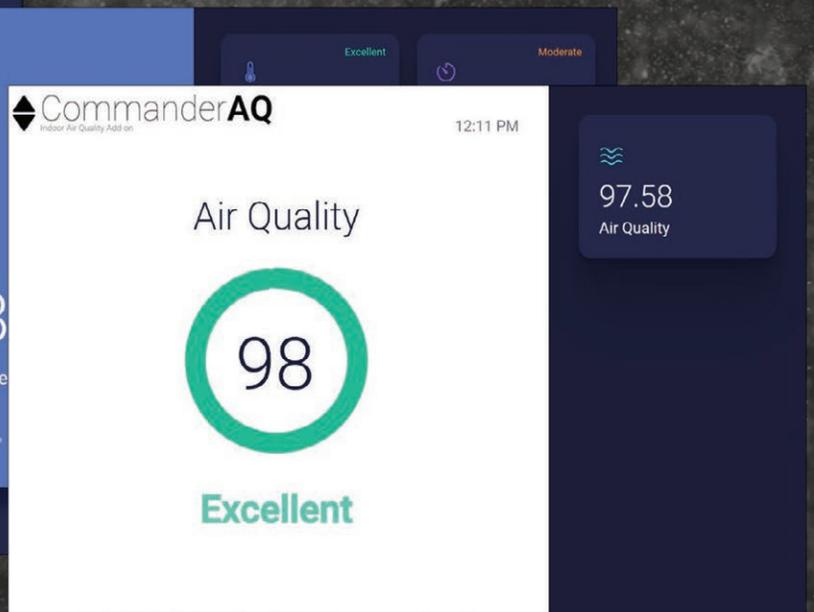


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Today's technology, coupled with the characterized damper method of outside airflow measurement, allows this technology to provide real-time performance metrics which can be monitored with a building automation system or a local display for building occupants.

equipment or mechanical system, ducted or not. This new method uses a high-precision inclinometer mounted on an outside damper blade to establish a damper characterization curve, as well as several probes to accurately measure outside air (OA), return air (RA), and supply air (SA) temperatures.

Problem-Solving Technology

The cost to install a characterized damper airflow measurement system can be dramatically less than traditional technologies. More buildings, especially schools, need to measure outside airflow, which means solutions to truly address this problem must be affordable and reliable. Today's technology, coupled with the characterized damper method of outside airflow measurement, allows this technology to provide real-time performance metrics which can be monitored with a building automation system or a local display for building occupants.

Ongoing maintenance costs are minimal, since there are no probes in the unfiltered airstream to be cleaned or recalibrated, and

the supply airflow measurements are taken in filtered air. To ensure long-term accuracy, system diagnostics are regularly performed using automated air-measurement methods. If the system is found to be out of tolerance, the calibration routine can be reinitiated to establish an updated characterization curve to reflect the current mechanical system.

Considering the advantages of utilizing a characterized damper airflow measurement system, it could make proper ventilation achievable for nearly any building. And remember, the solution to pollution is dilution.



ABOUT THE AUTHOR: Jesse Shoemaker is the Director of OEM Sales for KMC Controls with over seventeen years of experience in product and sales management for the Smart Infrastructure market. He works with KMC's partners and clients to develop solutions in controls and sensing vertical markets such as Building Automation, HVAC, and Industrial Automation.



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The background of the page is a photograph of a modern ceiling. It features several recessed circular lights of varying sizes, some of which are illuminated, casting a warm glow. The ceiling has a light-colored, possibly white or off-white, finish. There are also some curved architectural elements, possibly part of a chandelier or a decorative structure, that are visible in the foreground, creating a sense of depth and perspective. The overall lighting is soft and ambient.

LIGHTING TECHNOLOGIES

Enhancing Aesthetics, Functionality, and Sustainability on Campus

by David Vinson, PhD

A devoted cinephile likely knows Charles Laughton's riveting and unforgettable *The Night of the Hunter* (1955), a film that manages to defy common sense by combining seemingly incompatible genres. The movie is similar to neo-noir inspired by German expressionism, with elements of the fairytale, the pastoral, and the musical. This story is deeply invested in light and dark, both of which surface literally in the film's aesthetics as well as figuratively in thematic depictions of good and evil, of innocence and corruption.



Take, for instance, Robert Mitchum's role as Reverend Harry Powell, a psychopathic snake-oil scripturalist who adorns the tattooed letters of "LOVE" on the fingers of his right hand and "HATE" on his left. Powell travels along the Ohio River and preys upon unsuspecting widows with hefty savings—in one instance, Willa Harper, played by Shelley Winters—each of whom is baited by his rugged good looks and seasoned affectations as a serious, god-fearing man. Powell murders poor Willa, and the director Laughton stages the scene with light that floods down as if from the triangular steeple of a church. Aesthetics and theme work in harmony: Willa's face is illuminated, the innocent that she is, and nearly imperceptible in the shadows is the lurking figure of Powell, waiting to strike.

Art reminds us of the power of light and dark to evoke mood and even to transform—in cinema, lighting techniques represent a kind of grammar, a form of speech. In architecture, the use of light is not so different: it influences how we feel, just as it informs how we navigate and understand our physical surroundings. In college settings, the use of lighting in interior spaces may prove the difference between college-bound students feeling at ease and at home or their feeling confined and unsettled. The right lighting can set the tone for how students feel as they rest, study, exercise, or socialize.

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*Ms. Jennifer Sexton
Coordinator of Recreational fitness & Wellness
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In summary, Fitness / Wellness Assessments are now considered one of the “best practices” to enhance an overall campus life experience; with HealthWizard software, group analytics can also allow organizations to create “evidenced based outcomes” to assess the results from their investment in staff, facilities / equipment, as well as their overall health promotions and wellness programming efforts.

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Lighting brings an emotional value to architecture, and whether it's daylighting or light supplied artificially, light allows us to take in the beauty and functionality of the buildings we explore.

Lighting draws attention to textures, color, and the variety of ways in which a space may be used.

Lighting brings an emotional value to architecture, and whether it's daylighting or light supplied artificially, light allows us to take in the beauty and functionality of the buildings we explore. Lighting draws attention to textures, color, and the variety of ways in which a space may be used. To strike a balance between lighting and architecture, it's useful to prioritize three key components of architectural lighting: aesthetics, functionality, and sustainability.

The Aesthetics of Daylighting

The aesthetic value of lighting impacts the emotional experiences that our students may have as they occupy interior spaces on campus. Designers and architects labor to create these experiences, and they prioritize the manner by which exterior lighting can draw students in; further, they capitalize upon the variety of ways that interior lighting can create an atmosphere of warmth and comfort.

Daylighting adds a calming effect to interior spaces, and another benefit is that it minimizes the need for artificial lighting, which can in

turn decrease lighting energy use in buildings by 50-70%. Effective daylighting ideally uses soft, diffuse sky light as well as reflected light rather than direct sunlight, especially during warmer months. The placement of windows makes a major difference, too. For instance, south-facing windows with overhangs provide indirect light in the summer. Windows facing east or west let in light during the morning and evening, although they may cause glare and absorb heat during the summer. North-facing windows are useful for daylighting because they admit comparatively even, glare-free light and practically no additional heat during the summer months. The number, size, and glass type of north-facing windows should be carefully considered, however, as they do lose more heat than insulated walls.

Clerestory windows are vertical windows located near the top of a wall. They illuminate the ceiling by bringing in natural light, and the reflected light from the ceiling is soft and indirect, not unlike the effects of skylighting. Clerestory windows also allow light to extend

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deeper into rooms than windows set a standard height, especially when used in combination with light-colored overhangs or ceilings. Another strategy for contributing to the aesthetics of a space is to consider reflecting light to reduce glare and allow light to reach areas that otherwise lack natural light. Painting interior walls and ceilings can enhance reflected light, and light shelves can provide shade for south-facing windows.

The Functionality and Sustainability of Artificial Lighting

Along with aesthetics, other key components of architectural lighting include functionality and sustainability. We want lighting to be presented as advertised and its appeal to be obvious and true. But we also must be confident that lighting serves its most immediate purpose: to help us see clearly. Spaces should be illuminated so occupants feel safe as they navigate a room or entire building, and this illumination should include the floors and walls, as well. Additionally, lighting should be long-lasting and save energy.

One such strategy for enhancing both lighting functionality and sustainability is the use of a Light Emitting Diode (LED), which is among the most efficient lighting technologies. LEDs use 25% of the electricity of incandescent bulbs and last up to twenty-five times longer, proving to be ideal for enduring sustainability. They also emit almost no energy as heat, whereas incandescent bulbs release 90% of their energy as heat, and compact fluorescent lights (CFLs) release nearly as much. Ambient lighting with LEDs helps set the tone for any room and is most commonly found in overhead fixtures in addition to floor and table lamps, most of which also function as task lighting. And because LEDs are an energy-efficient lighting option, they are ideal for general lighting purposes that are used frequently in public restrooms, offices, study nooks, classrooms, laboratories, and many other on-campus spaces.

LEDs offer the added benefit of impressive versatility. For instance, LED strips can transform a dorm room, not to mention the display shelves of campus-based shopping centers or the walls of student activity centers. Color remotes can be used to satisfy the desired mood of users or to set the tone of a campus-based event—and because LEDs use fewer watts, they are better for the environment but remain brighter and longer lasting than other options. LEDs used for accent lighting are also a great way to amplify design elements inside a campus welcome center or in buildings that stage cultural events. Since they emit no UV light and minimal heat, LEDs are great for safely lighting artwork or adding picture lighting. Accent lighting also helps to produce added dimension in combination with ambient and task lighting. To draw attention to the item or feature being highlighted rather than the lighting itself, effective accent lighting can be angled or directed to create a spotlight. Common options include recessed lighting, track lighting, and wall-mounted light fixtures.

Another option for lighting, and one congruent with the ethos of green buildings and the sustainability movement, is called High Intensity Discharge (HID). HID lamps, for example, are the most efficient lighting available and can save up to 75%-90% of lighting energy when replacing incandescent bulbs. HID lamps take up to ten minutes to produce light when first turned on, and for that reason—and due to the intense light they produce—HIDs are best suited to outdoor lighting and large indoor areas where lights remain on for at least an hour.

Lighting and Green Construction

The concept of a green building is constantly evolving, but it can be generally defined as one that has minimal impact on the environment. Also known as green construction, sustainable building refers to both a structure and the use of environmentally responsible and resource-efficient processes throughout the life cycle of the building: from siting to design, construction, operation, maintenance, renovation, and even demolition. Lighting remains a vital component of sustainable design, and lighting technologies have understandably shaped how we think about ergonomics, human health and comfort, and energy consumption. As prospective and current students explore and enjoy our campuses, let us offer them lighting technologies that are sustainable, beautiful, and beneficial to their emotional well-being.



ABOUT THE AUTHOR: Dr. David Vinson has a PhD in English with specializations in transatlantic literature and cultural studies. He is a committed scholar, teacher, and dad. If you ever meet David, avoid the subject of soccer. His fandom borders on the truly obnoxious.



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**THE IMPORTANT
QUALITIES OF
LABORATORY
SEATING**

by Kelsey Baska

Seating is everywhere we go, from our homes and workspaces to the restaurants we dine at, our dentist's office, or the type of transportation we use. All are different examples of environments with varying expectations for comfort, cleanability, and functionality.



MATT KOCOUREK PHOTOGRAPHY

Laboratory environments are sensitive spaces that have specific requirements when it comes to casework and seating. However, sometimes these standards aren't considered. For example, office chairs are often incorrectly placed in these environments because of their favored aesthetics or traditional comfortability. But these chairs are not designed to support the user or to meet the demanding needs of the lab facility.

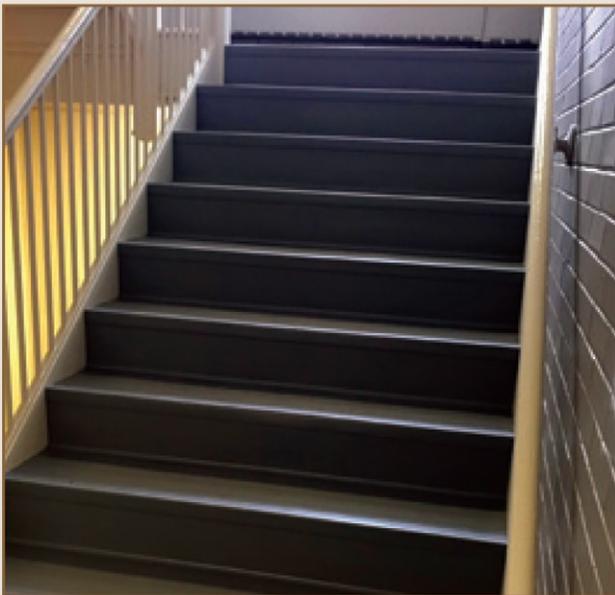
When selecting seating solutions for laboratories, planners must recognize and meet the technical standards of these environments so that people can work safely within the space.

Cleanability

With the continuing spread of Covid-19, cleanability is top of mind for almost everyone around the globe. In a pre-pandemic world, some might not have understood how crucial it is to consider the correct surfaces, textiles, and materials when selecting furniture for shared spaces. But these are requirements that have always been important to sensitive environments like laboratories.

In a workplace with cleanroom requirements, keeping contaminants out is job one. When prioritizing infection control, seating solutions with minimal joints and user adjustments are preferred because these features decrease points of user contact and allow for quick cleaning. Surfaces that are

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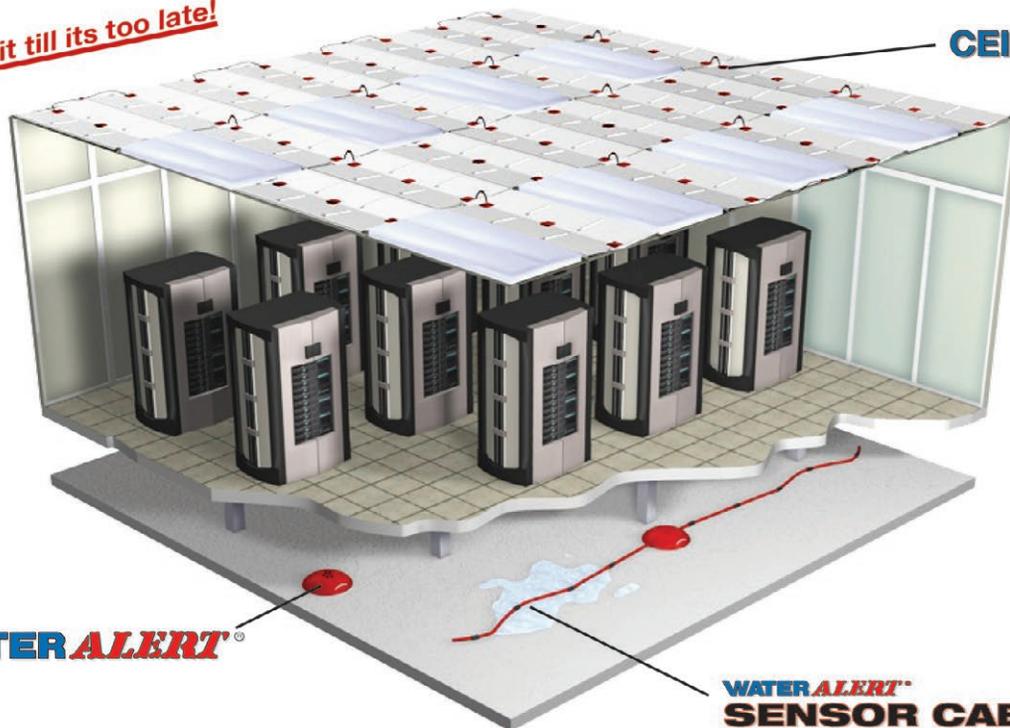
Seating solutions are often used differently in technical spaces than anywhere else. Therefore, decision-makers must consider products designed to accommodate multiple users throughout numerous shifts over twenty-four hours. In these busy environments, several people could be using the same chair throughout the day, in stark contrast to an office setting where someone typically has a chair assigned to their cubicle or desk for individual use. Because of this reality, seating solutions must be adaptable and intuitive to multiple users in the lab setting.

When selecting furniture for lab environments, planners must prioritize ease of use. An array of knobs and levers is not practical for the everyday routine of lab professionals; the last thing they need to focus on is whether or not their chair is adjusted correctly to meet their needs. By incorporating intuitive function into the design of a chair, unnecessary user-made adjustments, such as seat or back tilt, are eliminated. As a result, users can focus on their work without worrying about the comfort and fit of their chairs. In addition, minimal parts mean fewer points of failure and less part replacement.

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Lastly, chairs must accommodate various body types to ensure a similar and comfortable experience for a range of people.

Versatility

The cost of lab space is at a premium, so it's essential to make the most of it. These environments can't afford to be crowded with varying chairs and stools, or else highly trafficked hot spots can become congested. Because of this situation, lab seating needs to be multipurpose and versatile.

Lab environments often consist of different workstations, and some host flexible furniture systems that are height-adjustable and mobile. For seating solutions to be compatible, they must accommodate multiple workstation heights and quickly move between areas. In addition, the seating positions in labs are unique and vary based on activity. For example, users are often perched on the edge of their seats or are forward in posture. Because of this variety of use, chairs in these spaces need to support such active movement. Examples of this flexibility could be that a chair is easy to get in and out of, provides solid lumbar support, or has a non-slip seat that flexes with the user. Lastly, chairs with smaller footprints are beneficial in these environments, as they take up less space.

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Decision-makers must consider the needs of the lab professionals who will be using these chairs every day and who depend on equipment that will safely support them and the significant work that they do.

After all, everyone deserves a great chair.

Built for the Environment

The demanding nature of lab and technical environments means seating surfaces need to meet high standards of performance and function. In some cases, products must test to conform to environmental standards, such as ESD and Cleanroom. In short, this requirement means that not just any chair can be chosen for the space. It is crucial to select seating solutions built specifically for the lab environment and are just as meticulously designed as any other piece of scientific equipment.

Textiles and frame components make up most of the anatomy of a chair and receive the most traction from users and the surrounding environment. Therefore, these materials must be strong enough to hold up during active use or, for example, the wear of higher seat heights. In addition, materials must qualify to withstand the chemical exposure and stringent cleaning regimens of lab spaces. Finally, it is also necessary that materials are durable enough to resist punctures, abrasions, and tears.

Prioritize Technical Standards

When selecting seating for laboratory spaces, planners should prioritize solutions that meet the technical requirements of these sensitive environments and are flexible to work in unison with other furniture. Also, decision-makers must consider the needs of the lab professionals who will be using these chairs every day and who depend on equipment that will safely support them and the significant work that they do. After all, everyone deserves a great chair.



ABOUT THE AUTHOR: Kelsey Baska is the Marketing Manager for Cramer LLC, located in Kansas City, MO. In 2017, she graduated from the University of Kansas with a degree in Journalism and emphasis in Strategic Communications and began working for Cramer later that year. She is the proud cat mom of two. <https://cramerinc.com>.

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New Building for Emory Musculoskeletal Institute

A ribbon cutting was held recently to celebrate the official opening of the 180,000-square-foot, world-class Emory Musculoskeletal Institute, located in Emory's Executive Park health innovation district in Brookhaven, Georgia. The new six-story building—with a focus on innovation, improving the patient experience, and research—will continue to provide all musculoskeletal services in one convenient location for patients and serve as the central hub supporting ten regional offices ranging from LaGrange to Flowery Branch.

“The Emory Musculoskeletal Institute is a state-of-the-art facility ready to serve Georgians with exceptional clinical care, forward-thinking research, and profound training opportunities for the next generation of clinicians,” says Emory University President Gregory L. Fenves. “The institute reflects Emory's highest aspirations for patient-centric care and the role of research to improve lives.”

The comprehensive, patient- and family-centered facility is comprised of non-operative and surgical treatment expertise in orthopedics and spine care, physical therapy and rehabil-

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itation, imaging, and ambulatory/outpatient surgery along with clinical and discovery research support space.

The building will serve as the home base for multiple centers of excellence and a variety of programs, including the Emory Spine Center, the Emory Joint Reconstruction Center, the Emory Foot/Ankle Center, the Emory Upper Extremity Program, the Emory Musculoskeletal Oncology Division, and Emory Orthopaedic Physical Therapy. Clinical, translational, and basic research programs can also be found in the Emory Musculoskeletal Research Center.

“The new building, with exceptional leadership, clinicians and scientists, will assist in attracting and retaining the best faculty, staff, trainees and

researchers, while serving patients for both routine and complex orthopedic treatment and care,” says Jonathan S. Lewin, MD, CEO of Emory Healthcare and executive vice president for health affairs for Emory University. “We expect the Emory Musculoskeletal Institute to be a destination musculoskeletal facility.”

To improve the patient experience, patients and visitors will find a large, nearly 800-space parking deck adjacent to the building with no charge for parking. Once inside the building, patients and visitors can engage in an interactive building web site with detailed information about the programs, care providers, research trials, and even a digital artwork tour of the building. All patient exam rooms contain large LED monitors automatically providing information about the expertise of the specific physician being seen during their visit and the specific anatomy diagrams and surgical procedure diagrams customized for each patient's care plan.

When designing the building, sustainability played a major role in planning to reduce the carbon footprint of the building. “Emory's vision to be a model of transformative practices and sustainable choices at every level serves as the inspiration for the eco-friendly design of the building,” says Scott D. Boden, MD, director of the Emory Musculoskeletal Institute and professor and chair of the Department of Orthopaedics at Emory University School of Medicine. “Strategic lighting in the facility aims to reduce light pollution and helps Emory be a good neighbor to the surrounding community. More than 95% of stormwater and runoff water will be contained through a system of bio-swales, retention ponds and underground stormwater systems to enhance on-site water management.”

In addition, automatic tinting glass on the southern, sunny side of the building will adjust based on ambient sunlight to control temperature and decrease energy consumption, reducing the need for shades while maintaining an open feel to the space. The “smart building” has special monitors that trigger increased fresh air flow in populated areas based on studies that show improved comfort and cognitive function. Indoor water use has also been reduced by 30%.

The building has a custom smartphone app designed for its staff that allows touchless entry at all security points, automatic elevator calls, adjustment of room temperature and lighting scenes, and booking of conference rooms in real time. The design team is pursuing gold certification in Leadership in Energy and Environmental

(LEED) Design for the newly constructed facility.

The new Emory Musculoskeletal Institute also upholds Emory Healthcare’s motto, “Go where the players go.” Emory Healthcare serves as the official team health care provider for the Atlanta Braves, Falcons, Hawks, Dream, Georgia Tech, Emory, and a host of high schools and youth and club team programs throughout the metro area. These players come to Emory for their health care needs. “Emory Healthcare has been an integral partner in helping us grow our franchise with our best-in-class training facility, the Emory Sports Medicine Complex,” says Steve Koonin, CEO of the Atlanta Hawks & State Farm Arena. “We are proud to support Emory Healthcare, a local institution with a world-class reputation, who is responsible for providing the most advanced health care to both our players and the entire greater Atlanta community.”

“We want to congratulate Emory Healthcare on the opening of its new Musculoskeletal Institute,” says Rich McKay, president and CEO of the Atlanta Falcons. “This new facility is another advancement toward innovative technology in orthopedics and truly providing the best care in our city. We know the facility will be special in all regards.”

“This innovative facility with attention to every last detail is yet another example of why we trust the Emory Healthcare team with the health of our athletes and staff,” says Derek Schiller, president and CEO of the Atlanta Braves.

This new facility, in combination with the Emory Sports Medicine Complex next door and ten regional offices—in Decatur, Dunwoody, Flowery Branch, Johns Creek, LaGrange, Smyrna, Spivey Station, Stonecrest, Sugarloaf and Tucker—allows Emory clinicians to care for even more patients throughout the region and beyond.

“The new building, with exceptional leadership, clinicians and scientists, will assist in attracting and retaining the best faculty, staff, trainees and researchers, while serving patients for both routine and complex orthopedic treatment and care,” says Jonathan S. Lewin, MD, CEO of Emory Healthcare and executive vice president for health affairs for Emory University.



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Fundraising for Stadium and Media Center at Belhaven University

Belhaven University has announced plans to construct the Belhaven Bowl Stadium Operations and Media Center. This project represents the completion of a \$4 million transformation of the historic Belhaven Bowl in 2016. This project included the installation of a custom turf playing surface, comfortable chairback seating for 1200 people, and a state-of-the-art Daktronics video board.

The University is currently raising the funds through the Belhaven Bowl Champions Fund. The new Stadium Operations and Media Center will provide essential state-of-the-art facility in-game resources for sport coaches, game officials, video board content staff, live stream support, broadcast and film crews, statisticians, and game-day support staff. The building will be flanked with outdoor pavilions equipped with ceiling fans, and it will be available for seating and entertainment. Restroom facilities both indoor and out are included amenities.

Located in the heart of the Belhaven University campus, the Belhaven Bowl Stadium

is home to both men's and women's soccer, the football program, and the oldest outdoor singing Christmas tree in the United States.

The Belhaven Bowl Stadium is one of the most beautiful NCAA Division III football and soccer fields in the nation. Additional uses of the facility include various summer sports camps, intramural athletics, and student life programming.

University athletes have earned three national championships for Belhaven. For the first time, there will be a physical memorial honoring those accomplishments. This project will include an impressive visual presentation honoring these national championships as well as a cherished football win.

Since 1964, the oldest singing Christmas tree in the nation has entertained residents of central Mississippi from the confines of the Belhaven Bowl. The Stadium Operations and Media Center, with its amenities and resources, will be a great enhancement to the performance of the Belhaven Singing Christmas Tree.

Located in the heart of the Belhaven University campus, the Belhaven Bowl Stadium is home to both men's and women's soccer, the football program, and the oldest outdoor singing Christmas tree in the United States.

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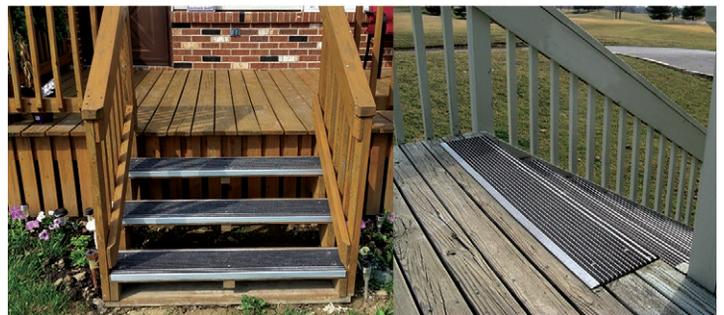
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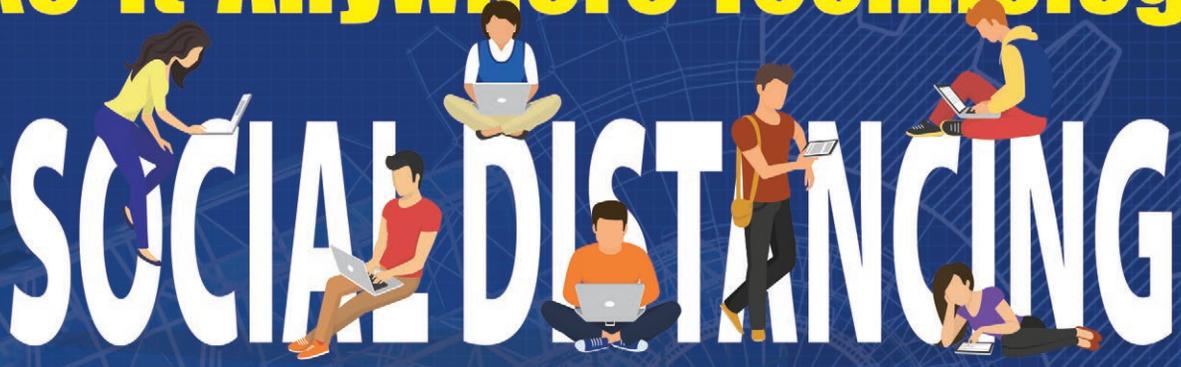
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