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APPLICATIONS OF AR & VR

**AMBITIOUS GROWTH
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**THE MARATHON THAT
STARTED IN LYNCHBURG**

**UNDERSTANDING NEW
BUILDINGS IN CONTEXT**

**ACTIVE LEARNING NEEDS
ACTIVE SOLUTIONS**

**DRAWING INSPIRATION
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TRACING THE PAST AND FUTURE OF VIRTUAL REALITY

According to Merchant et al. in an article for *Computers and Education*, virtual reality can be traced back to the 1960's. Initially it was the entertainment industry, with Morton Hailing's single-user console called Sensorama, which captivated its users.

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LAYERS OF REALITY: DISCIPLINE-SPECIFIC APPLICATIONS OF VR & AR

For centuries now, the concepts of education and learning have remained fairly stagnant—students attend class in physical buildings, memorize concepts, and are tested on their memory and comprehension of the materials through either paper exams or essays; however, as technology has advanced, many private colleges and universities are quick to adopt helpful tools for student growth.

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DEFERRED MAINTENANCE: AMBITIOUS GROWTH & FINANCIAL REALITIES

Annually, campuses are judged and ranked by various sources as to which has the most diverse student body, the highest academic standards or the most beautiful campus. However, appearances can be deceiving especially when it comes to the bottom line and an aging infrastructure.

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PRIVATE COLLEGES EMBRACE eSPORTS

As of 2020, only six years have passed since Robert Morris University made a splash by becoming the first college in America to offer scholarships to students to be members of their League of Legends team, which prompted their varsity eSports program. Six years ago, RMU announced a desire to recognize the growing legitimacy of eSports and to reward students with a competitive spirit who didn't play traditional sports.

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THE MARATHON THAT STARTED IN LYNCHBURG

The moment that made Kathrine Switzer an unintentional leader in the women's sports movement was made possible by a moment with much less fanfare, almost exactly a year earlier, when a Lynchburg College coach asked Switzer to join the track team.



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AI, ZAMBIA, & ECUADOR: ADVENTURES IN LEARNING AT MILLIKIN UNIVERSITY

As a faculty member in the Tabor School of Business at Millikin University, Dr. Mark Munoz has brought his students unique experiences that include working with Zambia to improve the country's economy, developing a marketing strategy for Ecuadorian handicrafts in the U.S. market, and even taking on the branding strategy for all of Ecuador.

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EDITOR'S LETTER

For the first time in my adult life, I did not set any resolutions for the new year. And, no, it's not because I've achieved perfection in all aspects of my life. As the clock struck midnight on New Year's Eve, I had been asleep for nearly six hours, sick and utterly exhausted, after a week-long trip to Disneyworld with my extended family—which was, ironically, my reward for an incredibly productive year.

Throughout 2019, I kept pushing myself to “earn” the privilege of this vacation by meeting personal goals, professional goals, and working to keep an endless string of short-term and long-term promises to myself about the tangible accomplishments I could tally as the year came to an end. By my third day in the kingdom of magic, I had gathered every germ that floated my way because my immune system was practically useless at that point.

My father declared that I was “worn to a frazzle,” and he was right.

As I was sitting down to write this letter, that phrase kept playing in my mind. I wondered if “frazzle-worn” was a uniquely Southern idiom, but I learned that the expression dates back to the early 1800s, as a blend of the word fray—as in a fight, battle, or skirmish—and the word fizzle or faselin, Middle English for “to unravel.”

How wonderful a description is that? We are worn to frazzles by internal battles where we slowly become unraveled from working too hard or for too long, or just never being satisfied and content with who we are and where we are in our lives.

I once loved the concept of resolutions—the idea that we can always be better and constantly grow. The determination to improve each year seemed so...noble. However, that notion of striving to always be better can have a rotten, hollow core, where the fire producing our drive only comes from telling ourselves we are not enough as we are, or that our best attempts are still falling short. From the first time we play a game and are told to win, to the first time we earn a numerical grade for our work as someone determines the value of our efforts—and how we stack up against others—we are in an endless competition for grades, jobs, ribbons, trophies, and accolades. If we aren't competing with others, we are competing with our last best effort, to match or exceed expectations.

For one of the work projects I'd been researching this year as we prepare to launch a new title at Flaherty Media, I reviewed hundreds of health & fitness magazines, blogs, posts, and the like. I needed to know where our magazine would fit in and what we could add to the conversation about organic eating, fitness, and health—in a way that was distinctly Southern. I'm sure it will not surprise you to learn that we are a culture obsessed with perfection: not just perfection for our bodies, but perfection in our habits, our lifestyles, our parenting, our relationships, and our careers.

College students have grown up with these Pinterest-perfect presentations of lives that are as make-believe as the magical world of Disney, but they can't escape the messages that permeate every form of media. How can we be surprised that anxiety and depression have skyrocketed among the young, when there are non-stop reminders of all the ways they could be better? Additionally, while I hope this next comment won't offend anyone, the truth is this: Even in much of our religious rhetoric—at least what I'm most familiar with—are the messages that confirm we all fall short of being worthy, even if we are forgiven and loved, despite our many failings.

So, my only resolution for each day of 2020 is to love myself. I will love myself as freely and fiercely as I love my family members. I will see myself and all of my many imperfections in the same light I see the complex, complicated, vibrant beings that make up my family: as wonderfully human and delightfully flawed.

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Dr. Mark Munoz of Millikin University is an international business executive, an outstanding professor with multiple awards in Teaching Excellence and Leadership, and a prolific author with several prestigious awards to his credit. In addition to his role as advisor to the AI Initiative at Harvard University and his groundbreaking work in the intersections between AI and industry, as a faculty member in the Tabor School of Business, Munoz has brought his students unique experiences that include working with Zambia to improve the country's economy, developing a marketing strategy for Ecuadorian handicrafts in the U.S. market, and even taking on the branding strategy for all of Ecuador.

PROFESSOR SPOTLIGHT

AI, Zambia, & Ecuador: Adventures in Learning at Millikin University

The “Goldilocks” of AI and Industry

When there was some money remaining in the budget for AI, Munoz told the provost that he could always go to another conference, or he could order several books on AI that a few students might read, or he could get a mini-robot. Soon after, he showed up to class with a new kind of teaching assistant in tow. The robot, Munoz notes, has taken their understanding of AI to another level, and the university has been incredibly supportive in providing tools to help Munoz collaborate with other Millikin faculty to help students work on developing apps to make the robot “smarter.”

Years ago, AI Naqvi, the founder of the American Institute of Artificial Intelligence, asked Munoz to collaborate on a book on AI. At first, Munoz hesitated, saying he wasn't an expert in artificial intelligence. Naqvi gently teased him—asking if he considered himself an expert on every topic of every book he had ever published. That convinced Munoz.

They gathered experts from around the world to talk about AI, and one of the things they learned was how difficult it was to find the middle ground—what Munoz called “The Goldilocks”—between industry-focus and

AI-focus. The goal was for the analysis to be “not too deep, not too shallow.”

Munoz stresses that industry needs to evolve and adapt as they use AI. Right now, he estimates, there is \$5 billion devoted to AI start-ups, which means the investment community is betting on it, and AI is estimated to have a huge impact on industries in the near future, representing as much as \$5.7 trillion.

Recognizing there was “quite a gap in the industry,” with a lot of people who know either “too much or too little,” Munoz was the one to suggest a second book on AI to Naqvi—one that might provide the “more holistic thinking” that was missing from current scholarship.

Munoz wanted to offer, in essence, “a 30,000-foot overview” for C-level executives that could provide companies useful advice for applying AI within their companies without becoming too technical. They also wanted something short—about 10,000 words—which turned out to be far harder than the first book they co-edited, as they worked to “crystallize the key concepts” in a thoughtful, useable way for businesses.

Naqvi explains, “AI is transforming business to run on science and scientific evidence. It's not just about automation. It is about intelligent

automation. If AI is cutting headcount and not making you smarter, it's a problem. That's like paying for an expensive education while cheating your way through school. Sooner or later, you'd realize that you didn't learn much and can't apply any skills—but you ended up with a lot of debt.” Their book was considered groundbreaking, presented at several conferences, and has been sold in bulk to many companies.

Naqvi notes that Munoz is an incredible networker, saying, “With Mark you're always only two degrees of separation from anyone you'd ever need in business.” These relationships happen, Naqvi explains, because Munoz is well-liked and trustworthy; he adds, “People respect him and want to work with him.”

Microenterprise Zones in Zambia

Munoz had written a book while a Fellow at Harvard, explaining that almost 90% of the world's businesses are micro-enterprises, making less than ten thousand a month; however, most books offering strategies to improve business are focused on far larger firms and companies. He suggested creating microenterprise zones, trade zones designed for these small businesses, to learn more about research, transportation, or other areas affecting their success.



About six months later, he received a call from someone identifying himself as a minister in Zambia, and assumed he was being pranked. But this was no prank. The Minister of Microenterprise in Zambia had read the book and wondered in which parts of the world Munoz had implemented these theories. Munoz's answer was succinct: "Nowhere."

The Minister asked if Munoz would be interested in pioneering this project in Zambia, and Munoz immediately thought, "Sure...with help."

Along with his class of twelve students, Munoz spent the semester focused on what microenterprise zones for small farmers in Zambia would look like—a course that was demanding for both the students and their professor. Student Kelsey Nihiser Zucker took the lead role in the project.

Zucker recalls, "We had other classes where we consulted with local businesses as part of our coursework, but this one we knew had an opportunity to create a global impact." When Munoz introduced The Microenterprise Zone (MEZO) concept of providing structure to those areas with informal economies, Zucker adds, "We all bought in to the idea and took it to heart."

They had editing sessions until the middle of the night to meet deadlines, but they also

"We had other classes where we consulted with local businesses as part of our coursework, but this one we knew had an opportunity to create a global impact. I think because we knew the stakes, and that this would be ultimately put in front of the Zambian government, we put our heart and soul into this project." — KELSEY NIHISER ZUCKER, STUDENT LEADER ON ZAMBIA PROJECT

had remarkable group cohesion that came from deeply caring about a project and having a strong "shared sense of purpose." Zucker explains there couldn't be a more perfect example of "practical application as an integral part of business education"—a tenet of The Tabor School of Business at Millikin University—than what Munoz offers. His classes are centered on performance learning, she adds, even for first-year or second-year students.

She describes Munoz as a "guide and mentor, always making sure that the students had ownership of the project." Though the MEZO concept was Munoz's, Zucker stresses how careful he was to ensure their ideas and

work stayed central to the presentation of the project. As an intelligent, well-traveled person with interesting stories about real-world applications, Munoz sparks excitement in his students, she explains, by infusing "a sense of adventure in our learning."

Reflecting on the experience, Zucker notes, "I think because we knew the stakes, and that this would be ultimately put in front of the Zambian government, the students put their heart and soul into this project." They were rewarded. After Munoz and his team of undergraduates traveled to Zambia to present their findings, the government of Zambia facilitated a multi-day safari for them.



Introducing Ecuadorian Handicrafts to U.S. Market

A few years after the experience in Zambia, the Trade Commissioner to Ecuador heard of Munoz's work in Zambia and asked if Munoz would help with a marketing plan for introducing their handicrafts to the U.S. Market. There was not much information for a thorough literature review, but the students dug in and came up with an impressive plan.

Haley Hogenkamp, a Millikin graduate who worked on the project, calls it "an incredibly formative experience for me as an undergraduate." Becoming aware of opportunities that she had never dreamed of before, Hogenkamp was inspired to serve as a Peace Corps volunteer and is currently at George Washington University, pursuing her master's in International Affairs.

"At the beginning of our project, we had no idea just how immense the undertaking of the project would be," Hogenkamp notes. "Additionally, it was high stakes. Our findings would inform decision-makers in Ecuador in a way that had never been done regarding handicrafts and the informal business sector."

Explaining how this was a type of learning unlike anything they had experienced before, she and her classmates served as "researchers, liaisons, managers, and strategists." In noting the many ways that Munoz goes beyond his role as a professor,

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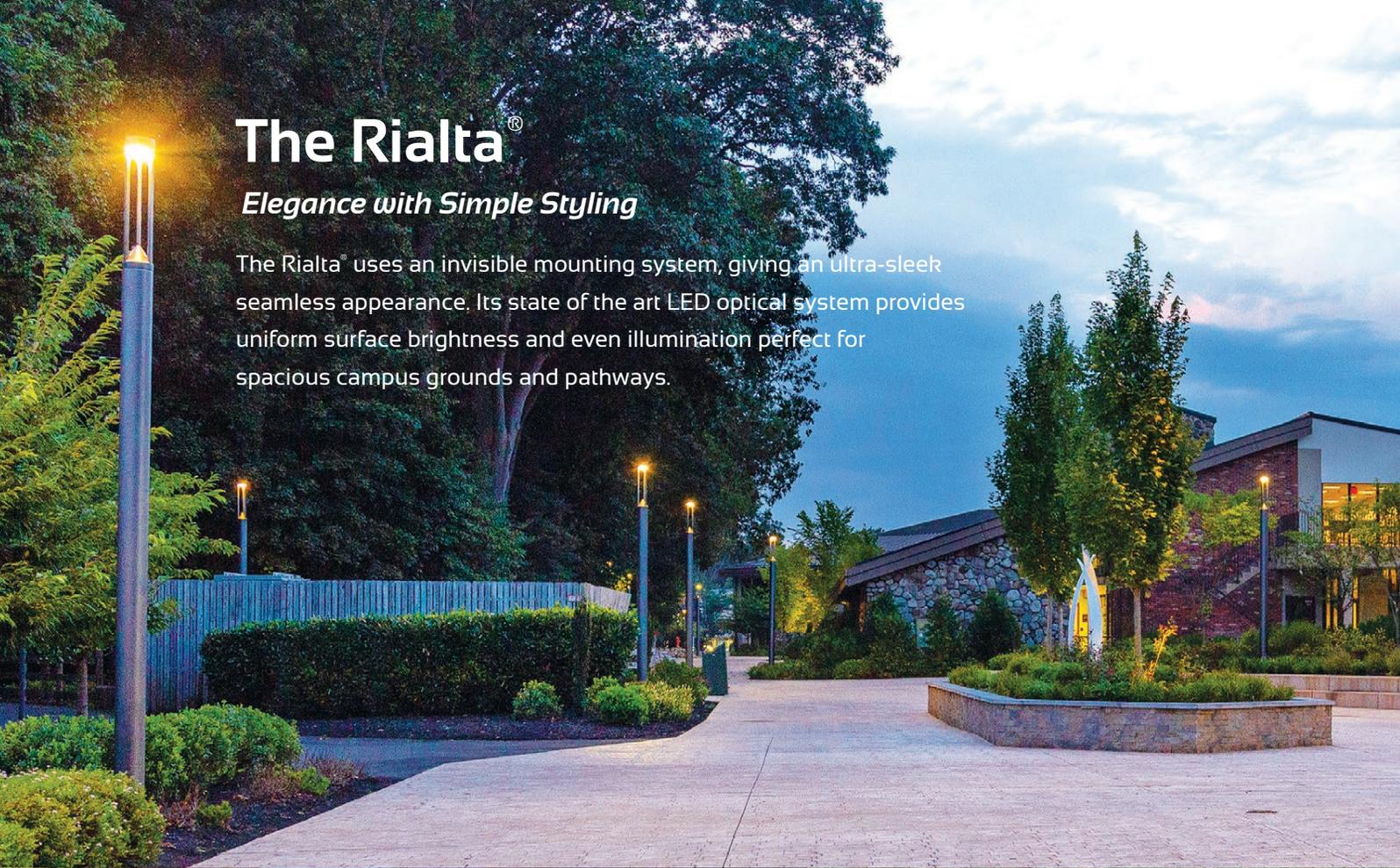
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“It was well worth the effort when we saw what a huge impact our research and global strategy could have on the country as a whole. The Consul, Trade Commissioner, and other government representatives were greatly satisfied with our findings and suggestions, which felt really gratifying after all of the hard work we dedicated to the project.”

— OLIVIA BREWER, STUDENT LEADER ON GLOBAL BRANDING PROJECT

Hogenkamp describes him as a coach, a mentor, and a role model—someone who constantly encourages his students, reminding them to be courageous and stay focused on the impact they are making.

Aside from the care he exhibits for his students and their professional aspirations, Munoz teaches his charges to think innovatively and creatively about their communities as they perfect their crafts. She adds, “His motivations were clear—to help students, to help a community, and to build a partnership that would better Millikin University and opportunities for students in the future.”

A Branding Project for an Entire Country

The next year, representatives for Ecuador reached out again to see if Munoz and his students would design a branding plan to help a small province in Ecuador that was struggling to entice tourists to visit, and they quickly agreed. Soon after, Munoz received another call; they asked if Munoz and team would be willing to plan the global branding strategy for the entire country.

With only eight students in the class that semester, which meant an even smaller team than normal, Munoz went to his undergraduates to

see what they thought. While they were “really, really scared,” he recalls, they also recognized the magnitude of the opportunity being offered.

Student Olivia Brewer took on the lead role in the project. Brewer recalls, “Creating a global brand strategy for the government of Ecuador was undoubtedly the biggest project I have worked on at Millikin.” In their small class of eight, as she remembers Munoz saying, it was as though they were “competing in the Super Bowl.”

After preparing months of primary and secondary research, the students decided they needed to completely restructure the report as it was, which—of course—created even more strain. Brewer notes they devoted over twenty hours a week to ensure the final report was outstanding. Despite a great deal of work and pressure falling to Munoz as well, he was incredibly proud of what they produced; they presented virtually in a video conference for people in Ecuador, Chicago, New York, and Spain.

Brewer added, “It was well worth the effort when we saw what a huge impact our research and global strategy could have on the country as a whole. The Consul, Trade Commissioner, and other government representatives were greatly satisfied with our findings and suggestions, which



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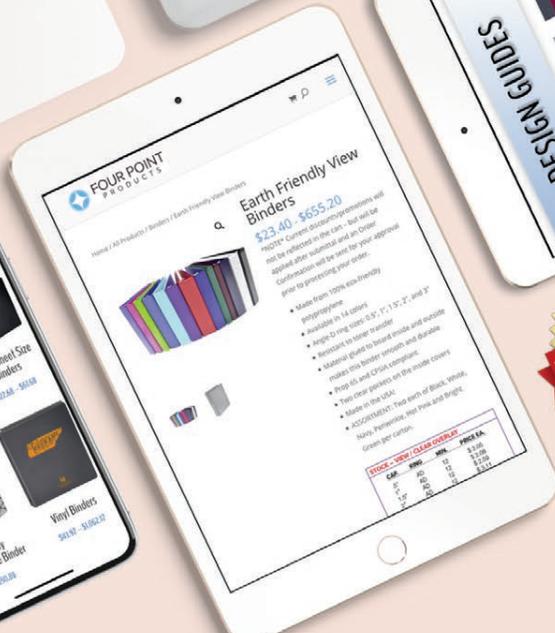
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Dr. Jeffrey Aper, Provost at Millikin University, shares that it is not at all uncommon for Millikin professors and their students to gain acclaim, whether that be locally, statewide, nationally, or internationally.

felt really gratifying after all of the hard work we dedicated to the project.”

Brewer credits Munoz for bringing this opportunity to her class and guiding them all to succeed—with his widespread network connections, his encouragement, his international expertise, and his unrelenting positivity.

An Endlessly Inventive Professor

Dr. Jeffrey Aper, Provost at Millikin University, shares that it is not at all uncommon for Millikin professors and their students to gain acclaim, whether that be locally, statewide, nationally, or internationally.

“Mark is a prime example,” Aper adds—a faculty member committed to his students, which makes him both a wonderful colleague and an “endlessly inventive” asset to the university—someone who is always seeking new

projects and new ways to engage their students. On any given day, Aper notes, he could get a text from Munoz about a presentation in Italy or a foreign government requesting their assistance. No matter the opportunity presented to Munoz, Aper stresses, he always looks for ways to involve the students and give them opportunities to learn that extend their education beyond the classroom.

“He epitomizes the character of the faculty,” Aper concludes, a group of people all committed to taking any extra steps for their students to help them understand what it means to be engaged professionals and to be involved citizens.

Aper quotes Millikin’s president, Dr. Patrick E. White, who often states that Millikin students are “learning courage.” They learn the courage of action. The leaders at Millikin believe so deeply in the impact their students can make on the larger world, Aper adds, that “it’s what we care about the most.”

A Heart That Won’t Say No

Each time he wraps a project, Munoz tells himself he can’t top what has just been done, while reflecting on how exhausting the work can be. He decided to give himself a break for the year. Then, he received a call—this one from the owners of a Bed & Breakfast in a struggling city in Florida, once a popular spot for tourism, where some small-business owners are now in trouble. They hoped to create a global branding strategy.

Munoz considered all the ways they had been working to improve other countries, and now a place in America needed their help. Though this project might not be as “glamorous” to outsiders as the larger projects, he admits, it was one that was “straight from the heart.” Not surprisingly, he determined, “How could I say no?”



ABOUT THE AUTHOR: Dr. Rachel James Clevenger earned her M.Ed. degree from Mississippi College. After finishing her PhD in Composition and Rhetoric, she taught and served as the University Writing Center Director for Birmingham Southern College and University of Alabama at Birmingham. Most recently, she taught Business Communications at Samford University.



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FACILITY PLANNING

by David Rose

Campus Project Planners Must Understand New Buildings in Context

Once completed, buildings are never viewed in isolation. For that reason, they shouldn't be conceived in isolation. Yet, sometimes—in spite of the best intentions of architects and their clients—things go astray. Architects always look to adjacent structures, local landmarks or regional influences for design cues that could inform a new building's aesthetic.

But here's what can happen: Campus administrators, as well as the donors whose dollars are footing the bill, want to be wowed. They want something distinctive—and architects are only too happy to deliver. It's what architects are trained to do and, if asked, what many would say they were born to do.

Being a Pragmatic Counterweight to Your Architect's Visionary Tendencies

Ideally, your architect has his or her feet on the ground, but failing that, you need to be the pragmatic counterweight to your architect's visionary tendencies—particularly on university campuses, where there is usually some sort of consistent architectural language in evidence.

The most successful campus projects result when administrators have a clear understanding of how they want their new building to fit within

the overall context. Working concurrently with two clients on very different projects served to heighten our appreciation of the importance of contextual clarity—and, more than that, to demonstrate how surprisingly elastic the definition of “distinctive” can be.

The buildings discussed here, polar opposites stylistically, were completed two years apart. The Pete Hanna Center looks like no other modern arena but blends seamlessly with the existing architecture on the Samford University campus. The Walter J. Manninen Center for the Arts looks like nothing else on the Endicott College campus but fits aesthetically within the contemporary norms of performing arts buildings. Among the things they have in common? Neither can be fully appreciated out of context.

Appreciating Campus Buildings in Context

The classical understanding of context derives from a time when most buildings were built in urban settings, and were either connected to their neighbors or at least in extremely close proximity—meaning that two and sometimes

three faces of these so-called “fabric buildings” (as in urban fabric) were hidden.

The rare building that stood apart from the urban fabric—a church, for example—used that separation as a means of gaining distinction. So-called “object buildings” can be approached from any direction, meaning that every face (or nearly every face) of the building, being visible, must get a similar amount of design attention.

Both the Endicott arts center and Samford arena are of a different class of object building, centering as they do around performance spaces that are very large and closed to the light. Further complicating their design, both building sites are more centrally located than is typical—many of the destination buildings that we specialize in, athletics and recreation facilities, are large and sprawling, and situated on the campus perimeter.

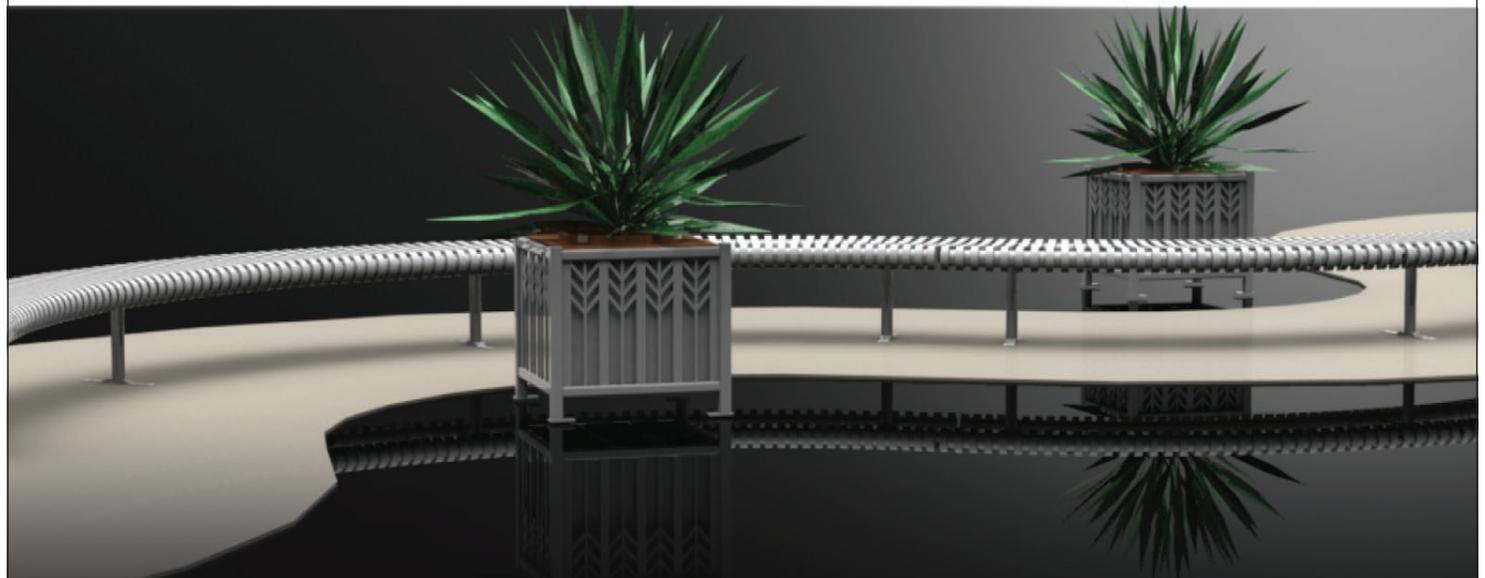
These building types, even surrounded by green space, often function as fabric buildings, featuring a very prominent and welcoming entry, with more monolithic building forms (gymnasium, natatorium) behind. Neither the Endicott arts center nor Samford arena could “hide” these large spaces from passersby.

Doubling Down on Extreme Design: Endicott’s Manninen Center for the Arts

Endicott’s Beverly, MA, campus is atypical in its proximity to the Atlantic Ocean, but it is otherwise like most college campuses in that its diverse range of architectural styles is a result of construction projects and real estate purchases that were engineered over many years by many different administrations.

Its 235 acres include a tavern built in 1750 that is now student housing, a former carriage house converted into a healthy-living dormitory, a 105-bedroom apartment-style building constructed in 1906, an estate that has served as a residence hall since its purchase in the 1930s, a Georgian-style president’s home, a conference center designed in an Italianate style by Guy Lowell (designer of Boston’s Museum of Fine Arts), and a residence hall that began life as a stable and later served as a gymnasium, theater and children’s center.

In essence, Endicott doubled down, telling us from the start that its new arts center should look like nothing else on the campus.



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A destination building because of its two performance halls, the facility could also be called (to coin a phrase) a “journey building,” since its location on a prominent hill sits directly atop a well-traveled path between the lion’s share of student housing and the center of the academic campus. That inspired the three-story atrium that is the building’s centerpiece and serves as both a connective and a social space (by presidential decree, the building is open at all hours to students).

The facility’s contemporary architectural style is unconventional for Endicott, yet puts it squarely within the traditions of arts buildings, featuring steel and curtainwall construction, large sweeping bands of glass in two colors, and glass-fiber-reinforced concrete that is horizontally scored to add texture and is slightly curved to bring a more modern rendition to the building.

Inside the atrium, balconies and landings are executed as thinly as possible, with glass railings used to further heighten the transparent feel. The result is an open, light and airy building—not overly adorned, visually

sustained in a sculptural way, and perfectly suited to its forested, ocean-view location.

Celebrating Classic Georgian Architecture: Samford University’s Pete Hanna Center

The Pete Hanna Center could not look more different. Samford’s Homewood, AL, campus boasts a uniform Georgian style of architecture based on Colonial Williamsburg, and we were told that our design of a new sports and special events center could not stray far, if at all, from its principles.

This involved some unique challenges. As much as performing arts centers, arenas want to be contemporary—virtually every other college in America has added glass curtainwall to its old arena in order to bring in much-needed daylight—and there’s nothing contemporary about any Colonial-era architectural style.

Its classical adherence to proportion, solid materiality and symmetry (Georgian houses feature brick and stone, columns, sloped roofs with dormers, and massive chimneys on both sides of the roof) could easily make a 5,000-seat

arena look like a 15,000-seat venue from the outside. Several architecture firms had tried before we were brought on board, having strayed too far from Georgian architecture to please the administration and introduced a budget as massive as a pair of chimneys.

With everything from the school’s front gate to the back garage in Georgian style, we had plenty of examples on campus to draw from. We hid some of the building’s mass by burying one end into a hill, and wrapped the building perimeter in smaller volumes that contain the 12,000-square-foot fitness center, locker rooms, team meeting rooms, a student-athlete academic center, offices for coaches and administrators, and a chapel.

But on the whole, we celebrated its mass, and sculpted it in the Georgian language, including a hipped roof with dormers, facades with temple-like repetitive columns, limestone surrounds around every window and, yes, dual chimneys rendered (like the rest of the building) in brick. At the same time, we made a few materials choices to keep within our guaranteed fixed price, such as using high-relief architectural-grade asphalt shingles instead of slate (with the bulk of the roof 75 feet above grade, the difference isn’t immediately noticeable).

Inviting Surprise and Awe

Both buildings stand out, but for different reasons. Approaching Endicott’s arts center from either direction, its contemporary look registers as a surprise—something distinct from the academic buildings to the west and the assortment of residences that surround it. And the sheer size of the elements that make up Samford’s arena can awe viewers, despite being perfectly in scale with other similarly detailed but smaller structures nearby.

My experience designing these two buildings is what cautions me never to judge architecture on the basis of one photo. It’s also why I strongly recommend that campus administrators walk their campus, as I will. Take stock of your entire inventory of older buildings before contemplating your new one.



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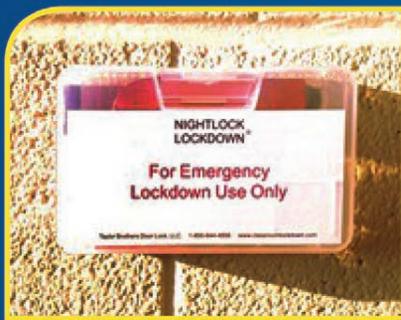


ABOUT THE AUTHOR: David Rose is an NCARB certified and licensed architect, and has been Director of Architecture at Stanmar

Inc. for the past 25 years. Wayland, Mass.-based Stanmar is a nation’s leading specialist in the design and construction of athletic and recreational facilities for private educational facilities.

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CLASSROOM FURNITURE

by Bob Hill

Active Learning Needs Active Solutions

If you picture a classroom or lecture hall, chances are the image you conjure will include rows of fixed chairs or desks facing the front of the room. The basic classroom design hasn't changed much in the last one hundred years. Educators have become conditioned to depend on standard-issue classroom, without challenging its effectiveness.

Turning to Movement to Improve Learning and Wellness

There's a one-size-fits-all furniture policy that doesn't end up benefiting educators or students. Even when it's clear the furniture is falling short, i.e. students forced to use desks that aren't the right size, chairs that are designed for easy stacking rather than proper spine support, or fixed stations that inhibit any form of group collaboration, often temporary solutions are sought, rather than addressing the root of the problem.

The underlying issue is that the average classroom is designed for students to sit. Forcing students to sit limits learning and results in sedentary behavior, which has been shown to have negative long-term health consequences. Something as simple as furniture designed for movement can have a big impact on an otherwise static learning environment.

Linking Movement and Learning

Scientists have been exploring the link between movement and learning for many years, proving that physical inactivity can impair developmental behavior and skills. According to the Association for Supervision and Curriculum Development (ASCD), movement can be an effective cognitive strategy to strengthen learning, improve memory and retrieval, and enhance learner motivation and morale.

Movement can also be credited with better health. Since the 1960s, obesity rates in the U.S. have tripled. Younger and younger people are now subject to diseases that were once associated only with older adults, and obese youth are more likely to have risk factors for long-term cardiovascular disease, such as high cholesterol or high blood pressure. Adding low-level physical activity such as standing into the classroom can make a difference.

Based on published studies of sit-stand desks with adults in office settings, adding even moderate amounts of movement can improve mood, reduce fatigue and promote an overall sense of well-being. For instance, Dr. John

Buckley with the University of Chester says that standing can burn 50 calories more per hour than sitting; just 4 hours of standing per day can add up to 20 pounds of fat in a year. Standing also increases blood flow and metabolism, burns more calories and improves focus and energy.

Staying Stuck in Static Mode for Generations

The real question is why our classrooms have been static for so many generations. When evaluating today's educational learning environments, it is surprisingly hard to find examples of where the research encouraging movement has had any impact.

Even with the great technological strides of our times, students are still sitting in traditional classrooms with fixed chairs and furniture; such furniture has limitations that impact physical and mental development. Traditional furniture allows next to no variation in posture and leads students into a largely sedentary routine through significant portions of their day. Designing a well-integrated, collaborative, active classroom means moving away from fixed furniture.

Rethinking and Reconfiguring

Educators and students have found that the effortless and natural reconfiguration of the classroom brings a new dimension to teaching and the curriculum as students move quickly to create various formations without wasting lesson time. Maintaining student attention also becomes less of a challenge; students report being more attentive and alert if standing.

Furniture designed for movement gives professors flexibility and adaptability in the way they teach, by enabling students to quickly and easily move about a classroom as needed. Desks with casters can be easily guided around a room to meet varying curriculums, from the 360 degree to the flipped classroom.

A traditional forward facing room can be reconfigured in just moments to allow for greater collaboration among students, without the typical chaos that happens in classrooms that are cluttered with stationary desks and chairs. Individual desks can be maneuvered and adjusted on a whim for the person or task at hand, and just as quickly returned to a starting position.

(right) **Spring (Ascending Waters)**
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Using Mobility to Support Varied Learning & Teaching Styles

The mobility supports the shift between lecture, discussion and project work. Mobile furniture fits a variety of classrooms, learning styles and teaching techniques.

Switching positions and having the ability to channel restless energy is also a key to an active learning environment. In the classroom, it can be done with student standing desks that adjust to the height preference of individuals and change easily, on the fly, without help from the instructor or facility managers.

Many standing desks offer height adjustment, allowing students to stand in the way that's uniquely comfortable, as well as move or fidget during class in a natural and non-disruptive way. The height adjustability can also be used to adjust desks to a collaborative level. With the use of stools, students can sit or stand at will, as their bodies' demand, without breaking lines of sight to the instructor.

Uncovering Pedagogical Opportunities

The opportunities to use this type of furniture in a classroom are broad. A professor can give

students a small group assignment and, within moments, students can be reconfigured into breakout groups, all of their materials and belongings traveling with them and immediately collaborating on a project.

Professors can also respond to the energy in a room and recapture student attention by encouraging students to stand up or quickly reconfigure their desks, since standing has the ability to renew focus and reduce disruptions. Enforcing a behavioral change that it's acceptable to stand, and the mentality that standing and movement is encouraged, is the best solution of all; movement will happen naturally, whether the curriculum directly encourages it or not.

Leveraging Natural Energy of Students

Creating a healthier classroom that's more conducive to learning requires leveraging the natural energy of students with curriculum that integrates movement and furniture. Adjustable height, mobile classroom furniture has earned its place as a strong option for health and performance.

Integrating low level physical activity, like that of using a standing desk, into the classroom can have a positive impact on student health, classroom engagement and academic performance. An active classroom also fosters frequent physical movement and the ability to easily interact with others, bringing movement—however subtly—into classrooms and learning environments during lecture periods, group projects, test taking or studying. Furniture that facilitates movement can finally give schools a means to achieve what research has already proven.



ABOUT THE AUTHOR: Bob Hill, Ergotron's Global Education Manager, is building greater awareness for how students, classrooms and schools benefit from adjustable standing desks. Ergotron is empowering smart learning with mobile device charging systems, height-adjustable student and teacher desks and AV mounts. To learn more, visit education.ergotron.com.

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CONSTRUCTION & PLANNING

by Ted Corvey

Drawing Inspiration from Other Projects

Virtually every private college has a variation on the same scene: At the end of each summer, hundreds of thousands of freshmen leave where they grew up and move to where they will begin their future lives.

Mostly, they came from places that had medical clinics, department stores, restaurants and houses. When you think about it, nothing's really changed. Your campus is now their town. And now, they have infirmaries instead of medical clinics, on-campus bookstores instead of department stores, dining halls instead of restaurants and dormitories instead of houses.

Facility Planners Explore Beyond Campus Settings

Carrying the analogy a bit farther, when faced with decisions about how to plan out the outside design of a college campus—the landscaping and buildings and sidewalks and streets—facilities planners in private colleges can look beyond their own campuses to get ideas. That can be especially true when others who have made decisions that you are facing are staring down some of the same challenges.

Take stormwater runoff, for example. Both cities and college campuses require a fair amount of hard surfaces, including parking lots, sidewalks, driveways, roads and rooftops. Both are generally in a limited amount of space.

Were the land left undeveloped, rainfall would be absorbed naturally, but once built up, it has nowhere else to go. The excess water can cause a surge downstream that can cause erosion, flooding and property damage. As a result, cities and counties are increasingly requiring property owners

to install storm water management mechanisms to keep more rainwater on site and return downstream flows closer to a volume that would occur naturally.

Many towns—and colleges, too, for that matter—are turning to genuine clay permeable pavers, atop a system of graded aggregates, as a solution. The pavers, which look virtually the same as clay pavers already in use in many places, have slightly wider gaps between them. The rainwater hits the ground, goes around the pavers and is held by the aggregates underneath, before gradually being released into the ground. There, the water is naturally filtered. There are multiple designs that can be adapted to a private college campus.

The Front Quad

Many private colleges have a front quad, bordered with classroom buildings, that looks like a well-appointed park. There are walkways and benches and carefully landscaped grounds.

In Palmetto, Florida, city planners set out to convert a former high school football field into a park. The idea was to add to an existing, adjacent park called Lamb Park, to create a central green-space corridor in the central

business district. Sutton Park, named for a town resident who was killed in the Vietnam War and dedicated to the memory of all military veterans, is in an area surrounded by historic homes, a library and a church.

During the design phase, three main themes emerged: Incorporating green construction into the design; minimizing stormwater which flowed untreated into the Manatee River; and being part of an overall effort to increase use of the downtown by building a family friendly environment.

Green design was incorporated by using clay permeable pavers, LED lighting, drought-tolerant landscaping and a low volume irrigation system using treated effluent. Stormwater runoff was addressed by specifying 23,000 square feet of permeable pavers, which combined a durable material capable of handling pedestrian and vehicular traffic with low-cost maintenance. The installation also handled stormwater well, during several heavy rainfalls and one tropical storm.

The variety of colors allowed design flexibility both in how the project looked and in how it allowed for the creation of gathering areas. Designers used concentric circles and other

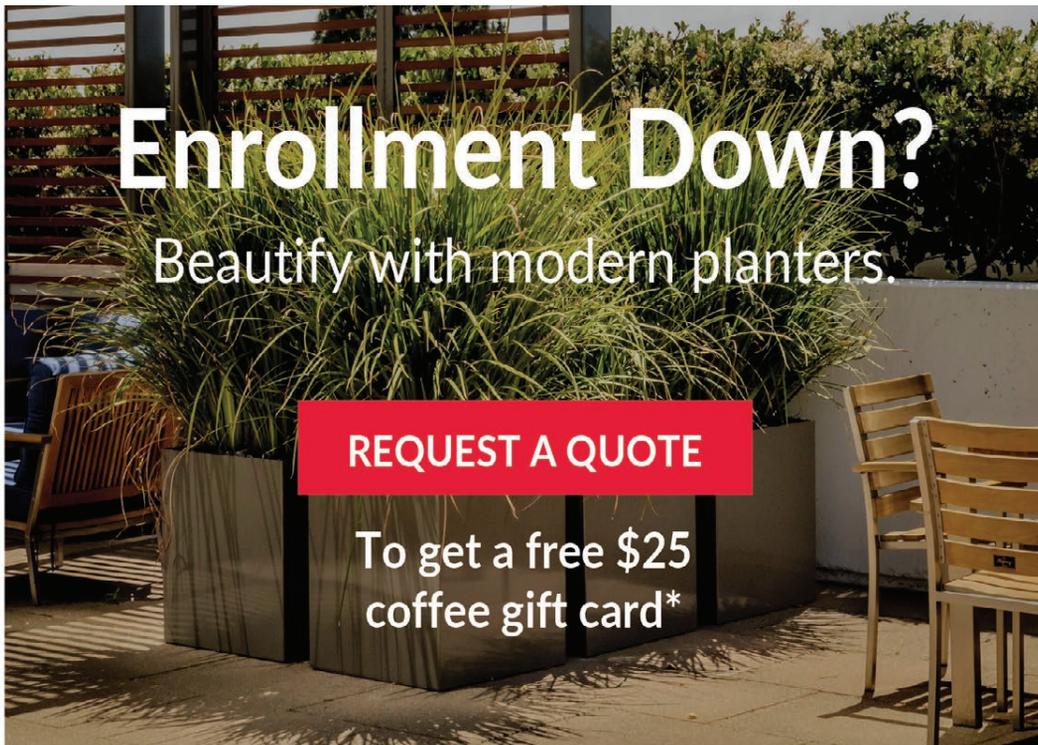
patterns to subliminally guide visitors around the park and to keep pedestrians and bicyclists separate. Contrasting pavers, not paint, were used to mark parking spaces.

Streets for Service Vehicles

Streets are part of the design complement of any college campus, to allow visitors, commuting students and faculty and service vehicles to enter and exit.

In New Albany, Ohio, city planners were looking at Third Street, near the center of town, which had turned from an asphalt street into a huge problem: Decades of severe weather had taken their toll and the street surface was far beyond a routine re-mill and resurfacing. Worse, at the bottom of a hill off Third Street, the Rose Run stream regularly flooded.

The big challenge was to come up with a new street that would look good, last longer and put a stop to the flooding. And all of that had to be done at a cost in line with budgetary restraints. The solution was permeable clay brick pavers. In a “best practices” pavement installation, all four goals were effectively reached: aesthetics, durability, the resolution of stormwater issues and cost.



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“Working with the stormwater master plan associated with this project, we generated some concepts to explore the best methods to deal with stormwater drainage,” said Franco S. Manno, ASLA, LEED AP and a senior landscape architect with Columbus, Ohio-based engineering firm EMH&T. “Our design options included bioretention, rain gardens, permeable pavement and other green infrastructure options. Permeable pavement was the one that made the most sense with this project.”

The cost to install permeable pavers came in at \$424,389 for the 12,200 square foot project. Estimates to install asphalt and conventional storm drain, including five years of maintenance, was \$427,718. That cost rose to \$434,085 if the street were maintained for 10 years.

The cost to maintain the permeable pavers is negligible, as it involves regularly sweeping or vacuuming debris from between the pavers, and perhaps sweeping more aggregates in between them. That’s in marked contrast to regularly fixing potholes and resurfacing the street every five years.

An additional savings comes because no underground storm drains are needed. The installation effectively captures and holds stormwater until it seeps naturally into the earth below. And underground repair—to telephone lines, water and sewer lines and the like—is simplified. Instead of jackhammers and asphalt patching, the pavers are removed and stacked to one side. Once the work is completed, the pavers are replaced.

A Bicycle Parking Lot

Paving a parking lot for faculty, staff and commuting students out of permeable pavers would go a long way toward resolving stormwater issues on a private college campus. A smaller installation, repeated several times, would likely have a similar effect.

For example, one public university in Columbia built parking pads for bicycles and scooters. The idea was to accomplish two goals. They wanted a good fit aesthetically for the central campus at USC, which already uses red brick pavers to define the space. And the second was to demonstrate the usefulness of controlling stormwater runoff in a small, defined space.

The addition of the pads will have other benefits, as well. Students and faculty will have an example in front of them of green construction, in that the clay pavers are made of shale and water, two of the most abundant building materials on the planet. Because they last virtually forever, they are the definition of sustainability. And because rainwater hits the pavers, goes around them and into the aggregates below before being absorbed into the earth, it is naturally filtered of pollutants.

And as it turns out, encouraging bicycling both reduces emissions into the atmosphere and is good for your overall health, as well. To sum up, using sustainable construction materials, reducing air pollution, and caring for student health sounds like a plan to be inspired by, wherever that inspiration may have originated.



ABOUT THE AUTHOR: Ted Corvey is vice president of sales and marketing at Pine Hall Brick Company, America’s largest manufacturer of clay brick pavers, including StormPave® and RainPave® clay permeable pavers. The two qualify for LEED points in a number of categories. For more information, visit www.PineHallBrick.com.



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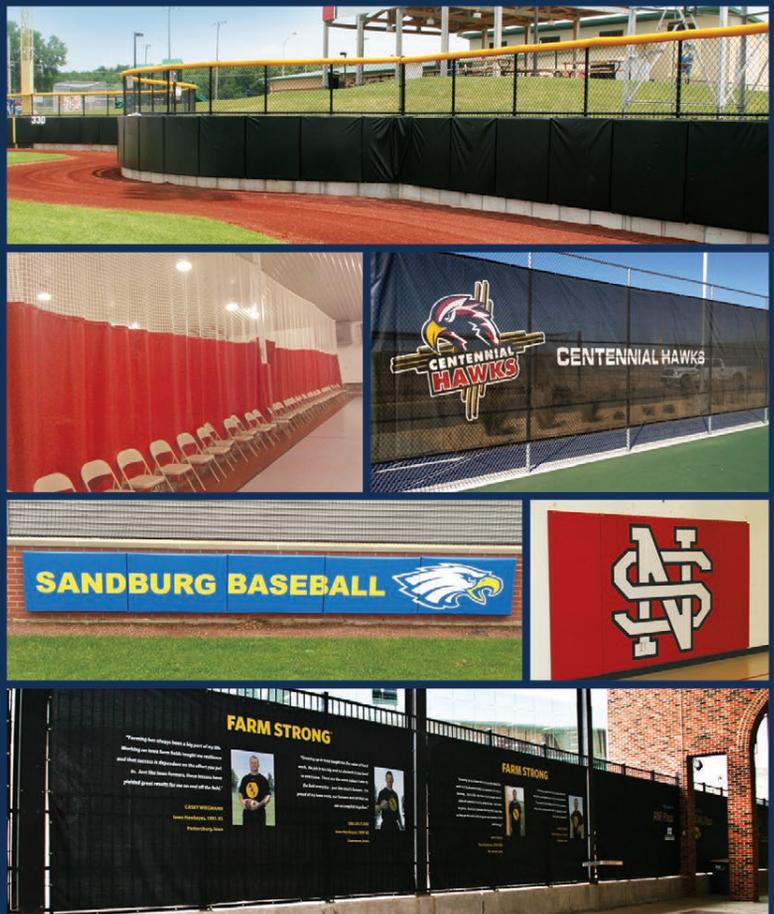
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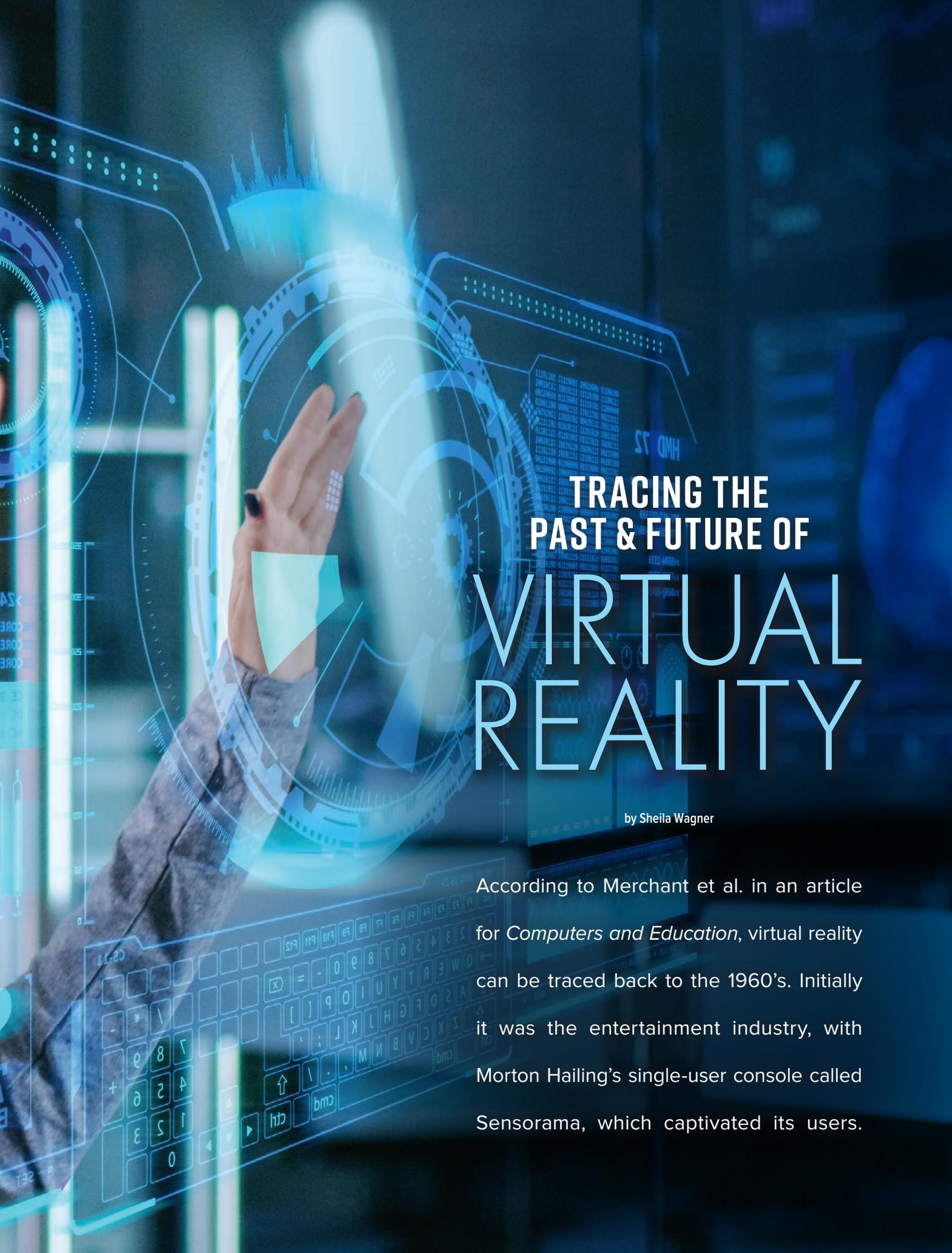


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TRACING THE PAST & FUTURE OF VIRTUAL REALITY

by Sheila Wagner

According to Merchant et al. in an article for *Computers and Education*, virtual reality can be traced back to the 1960's. Initially it was the entertainment industry, with Morton Hailing's single-user console called Sensorama, which captivated its users.



In the 1980's, as Merchant et al. explain, there was a dramatic surge of interest in VR technology in the field of professional education and training, such as flight simulator training.

Early VR in Higher Education

It was the early 1990's before universities began using this new technology in their educating of students, Merchant et al. add, with projects such as Science Space, Safety World, Global Change, Virtual Gorilla Exhibit, Atom World, and Cell Biology.

The designers of all these projects used a variety of peripheral devices such as head-mounted display gear, data gloves, and body suits for a fully immersive learning experience.

Unfortunately, there were many problems associated with these virtual reality technologies which limited their wide-spread use in educational settings. The main problem, initially, was the prohibitive cost of the products, as well as the maintenance of the sophisticated devices used to create an immersive environment.

In addition to the financial hardship, the users of these first projects experienced physical and psychological discomfort in the VR environments, including repetitive strain injuries as well as simulator sickness and disorientation.

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Gradual Improvements in the Tech

During the 2000's, with the improvements in technology, and the increasingly lower cost and increase in processing power of computers, Merchant et al. reported, there were desktop based 3-D programs which enhanced the learners' engagement.

More advancements in the technology later made it possible to use peripheral devices with the desktop computers such as headphones, shutter glasses, and data gloves.

Universities could now use simulations (interactive digital learning environments that imitate a real-life process or situation) to educate their students.

Simulations could be very cost-effective because a real life apparatus could be a major expense, while a virtual apparatus can allow students to perform procedures repeatedly until they have mastered the technique.

This repetition, without risk, is especially helpful for medical schools where the students can sharpen their skills before advancing to actual patients.

Modern VR Practices

Present-day virtual reality has a place in professors' classrooms of all areas of study, from mathematics to history, from science to the arts.

Merchant et al. found no differences between studies assessing students' achievement levels using knowledge-based, abilities-based, or skill-based measures for games or virtual worlds.

They suggest these findings indicate that both games and virtual worlds are suitable for learning outcomes.

Supplementing, not Substituting

In the book *Virtual Society? Technology, Cyberbole, Reality*, Steve Woolgar wrote about the psychological and social aspects of using technology in the classrooms.

This book was written in 2002, so the virtual reality that is the "real" reality of today's technology may not have been in his wildest speculations. What remains interesting are his thoughts about what was problematic about classroom technology in general.

Woolgar wrote, "All aspects of social, cultural, economic, and political life...stand to

be affected by the continued massive growth in electronic technologies."

He researched the initial scope of technology and the effects it had on personal interactions. He found that social impacts of electronic technologies were characterized by polarization between "narrow suspicion and uncritical enthusiasm."

Both sets of views, he continued, tended to assume that the effects of these technologies would be "predictable and universal."

While the early suspicions verbalized by many suggested that technology would take the place of personal interaction in offices and classrooms, his research showed that new technologies tend to supplement rather than substitute for existing practices.

At that time, some thought emails would take the place of in-person meetings and office memoranda and that teleworkers would make contact with prospective clients through the internet and not in person.

Of course, we know that didn't happen, and in fact, modern technology has made it possible to connect in many more ways than it did before.

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Moving Past Fear into Miracles

Because today’s students grow up in a digital world, they not only enjoy interacting with technology, but they might need it, quite frankly, to remain fully engaged.

Finding worries—whether they be practical, pedagogical, or philosophical—to accompany any of the latest advancements is easy. Moreover, fears about learning new tools, especially for educators with methods they have been successfully using for decades, is daunting. However, lifelong learners do not shy away from new challenges.

Ultimately, private universities and colleges must embrace the opportunities offered by Immersive Realities and appreciate what these tools can bring to the educational experience for students.

Today’s students have these opportunities only because they were born into an era where so much that was once considered sci-fi and fantasy is now simple to purchase, set-up, and experience. Students deserve to experience this miracle of science, technology, innovation, and creativity.



ABOUT THE AUTHOR: Sheila Wagner has spent the last several years working as a professional editor and recently became a staff writer for *Private University Products and News*. Wagner can be reached at sheila@pupnmag.com.

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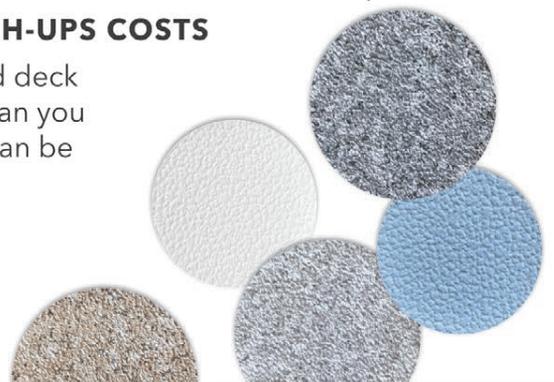
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LAYERS OF REALITY

Applications of VR & AR

by Cassidy Clevenger

For centuries now, the concepts of education and learning have remained fairly stagnant—students attend class in physical buildings, memorize concepts, and are tested on their memory and comprehension of the materials through either paper exams or essays; however, as technology has advanced, many private colleges and universities are quick to adopt helpful tools for student growth.

In just the last few years, the rate of technology advancement has increased exponentially, and we are living in what was once the world of tomorrow. Several institutions are taking full advantage of the opportunities new technologies, such as virtual reality and augmented reality, have to offer higher education.

Ever-expanding Forms of Reality

Discussions over the nature of what is real has been ongoing for centuries, leaps in our technological abilities have complicated notions of reality in ways both exciting and disorienting; without getting too metaphysical or philosophical, I'll just say that reality now has the capacity to be both fully synthetic, yet—for all intents and purposes—entirely real.

Virtual reality (VR) and augmented reality (AR) have reached a state of development where it is possible for the user to see, hear, and—in some cases—feel an experience that is fully artificially generated. The modified realities this technology brings to the classroom have real-world applications and long-term effects on students.

These innovative technologies have continued to expand, and though there are multiple facets to these alternative realities, most fall under one of two categories: VR or AR.

According to researchers Julie Dirksen, Dustin DiTommaso, and Cindy Plunkett with The eLearning Guild, VR simulates a fully interactive world, and this world can either be real or created.

On the other hand, AR is an overlay, such as video, photos, or sound, that goes over real-world content and places; these AR environments are not capable of interactions. When colleges make the decision to use the combined features of VR and AR, this is called *mixed reality*.

Telepresence or AR simulations

Examples of VR include features such as *Telepresence*, where the students enter a simulated environment and interact with generated avatars.

In a VR world, the students play an influential role in both their environments as well as the characters in the new world. This technology has prominent applications in clinical fields,

such as medicine or mental health programs.

Alternatively, AR includes features such as 360-degree videos or non-interactive simulations. One of the largest benefits of AR simulations is its speed; by running essentially limitless simulations, and controlling for all applicable factors, it is possible to rapidly amass an expansive data collection. This may be especially helpful for design or STEM students.

VR/AR Across the Disciplines

Private colleges and universities across the country are integrating VR into existing programs, and in some cases, developing new programs from whole cloth in order to provide their students with innovative, well-rounded educations. VR and AR are being used in everything from STEM to the arts to business.

In order for VR and AR to be truly immersive, programmers need artists. This is why some programs have constructed programs for students to exercise their abilities in both art and technology.

Savannah College of Art and Design (SCAD), for example, developed a BFA

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option in Immersive Reality. SCAD was the first university to ever use augmented reality in the creation of the first AR-driven college catalog produced and designed entirely by the university.

SCAD President and Founder Paula Wallace explains, “VR, AR, and MR—all studied in our immersive reality program—represent the greatest technological advances in a generation. What the Internet did to the world in the 1990s and 2000s, these new media will do in the next ten years. Every major company and brand in the world will be using some form of virtual reality within a decade, and SCAD is leading that societal transformation with its immersive reality degree. We’re making it possible for SCAD students to dream, experiment, innovate, and literally invent the next big thing.”

SCAD’s new building, The Shed, houses the immersive reality degree and the cutting-edge classrooms. Among other amenities, The Shed contains two fully equipped studio labs prototyping electronic and for robotics, a model shop for projects and teaching—where students can



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Photo courtesy Northwestern University, Feinberg School of Medicine

build 3D models from their original designs—advanced labs for VR and AR, and even a user-testing lab, including double-sided mirrors, to study user behavior on digital interfaces.

Drexel University's VR and Immersive Media program attracts students who are interested in combining technical and creative skills to produce interactive media, which can prepare them for the future of media consumption.

Applications in Theatre Arts are also popular. For example, Husson University utilized the power of AR to generate fully realized set designs on bare stages. Brave Williams, an assistant professor at the New England School of Communications, noted the importance of the cutting edge technology in a university press release; he stressed the necessity of embracing VR and AR technology in the theatre department and university in general.

According to Williams, along with a new College of Business, the school will also premiere an Interactive Experience (IEX) Center, which will house all immersive and interactive technology projects.

Also in the realm of business, Fordham University's Gabelli School of Business is using VR in their MBA program to develop teamwork and communication skills among the graduate students.

The program teaches lessons in communication and peer-support through interactive games, such as simulated plank walking and bomb diffusing. For the naysayer, these exercises may sound more geared to fun than educational benefits, but the values taught affect the student both cognitively and emotionally, which has been shown to improve long-term learning.

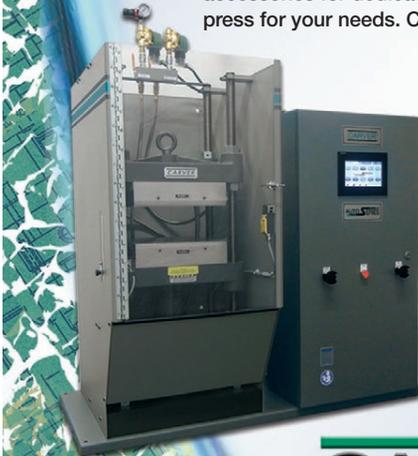
The Reality of the Future

VR is also becoming increasingly popular among top businesses, such as Verizon, LG, Intel, Bill and Melinda Gates Foundation, Athena Health, and LinkedIn, to name a few. Businesses are using VR and other associated training methods to improve skills such as customer service and design development across their organizations. Seeing the way successful companies are also engaging in the technology highlights the importance for colleges to train their students in VR/AR.

Akin to the way corporations are using VR, students can also learn practical skills that also require rigorous adroitness in an immersive platform without risking their safety. Many institutions are using VR learning in situations that may otherwise be too dangerous or costly for students to perform in the real world, such as nanoengineering, space exploration, or medical procedures.

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VR is essentially challenging the concept of what it means to be a part of a community and what it means to interact.

Basics of cognitive psychology teach that in order to learn and adapt behavior, one must experience a stimulus and response—there must be consequences from decisions, either in the form of punishment or reward. In other words, knowledge alone is not enough to change behavior. So while the research on VR and behavioral changes is a new field, the data thus far is promising in VR's efficacy to illicit change.

The Ultimate Empathy Engine

Researchers with The eLearning Guild noted that VR can impact behavior by enabling desired behavior, promoting empathy, allowing consequences to unfold, providing projected outcomes, giving feedback, and prompting emotional self-regulation.

Much like in classic behavioral psychology, VR provides a space for students to work through the stages of intervention, such as

problem assessment, intervention implementation, problem solving, addressing target behaviors, and experiencing outcomes.

These steps, when intermingled with the experience with VR, work to develop students' emotional and cognitive abilities via experience and empathy; many researchers in the field have begun calling VR "the ultimate empathy engine."

Medical Education Applications

According to *Enhancing Empathy: A Role for Virtual Reality?* VR can be used in medical schools to improve bedside manner and compassion, leading to more positive results compared to previous, more-traditional forms of training.

Northwestern University's Feinberg School of Medicine, for example, announced in 2018 their plan to begin assimilating augmented reality, such as VR and holographics, into their curriculum.

When discussing the use of VR, a clinician in Neurological Surgery and creator of Feinberg's neurosurgery virtual reality program, Dr. Michael Walsh, stated, "The possibilities are really extraordinary," and "it's clearly the wave of education in the future."

As Real as It Gets

Some may argue that technology is intertwined with humanity; since the invention of the wheel, something in the human spirit has desired further progress and innovation.

The rapid intensity of mankind's modern technological development and advancements may seem overwhelming at times, and some colleges may be hesitant to invest in something that could potentially be just another trend; however, the potential for quality learning that is possible through VR/AR is irrefutable.

These augmented realities have the capacity to improve education across virtually all disciplines, while also promoting the skills humanity has always valued, such as togetherness, communication, and compassion.



ABOUT THE AUTHOR: Cassidy Clevenger is a Samford University alum. She is currently in graduate school at Samford in the MSW program, while working as a staff writer for Flaherty Media.

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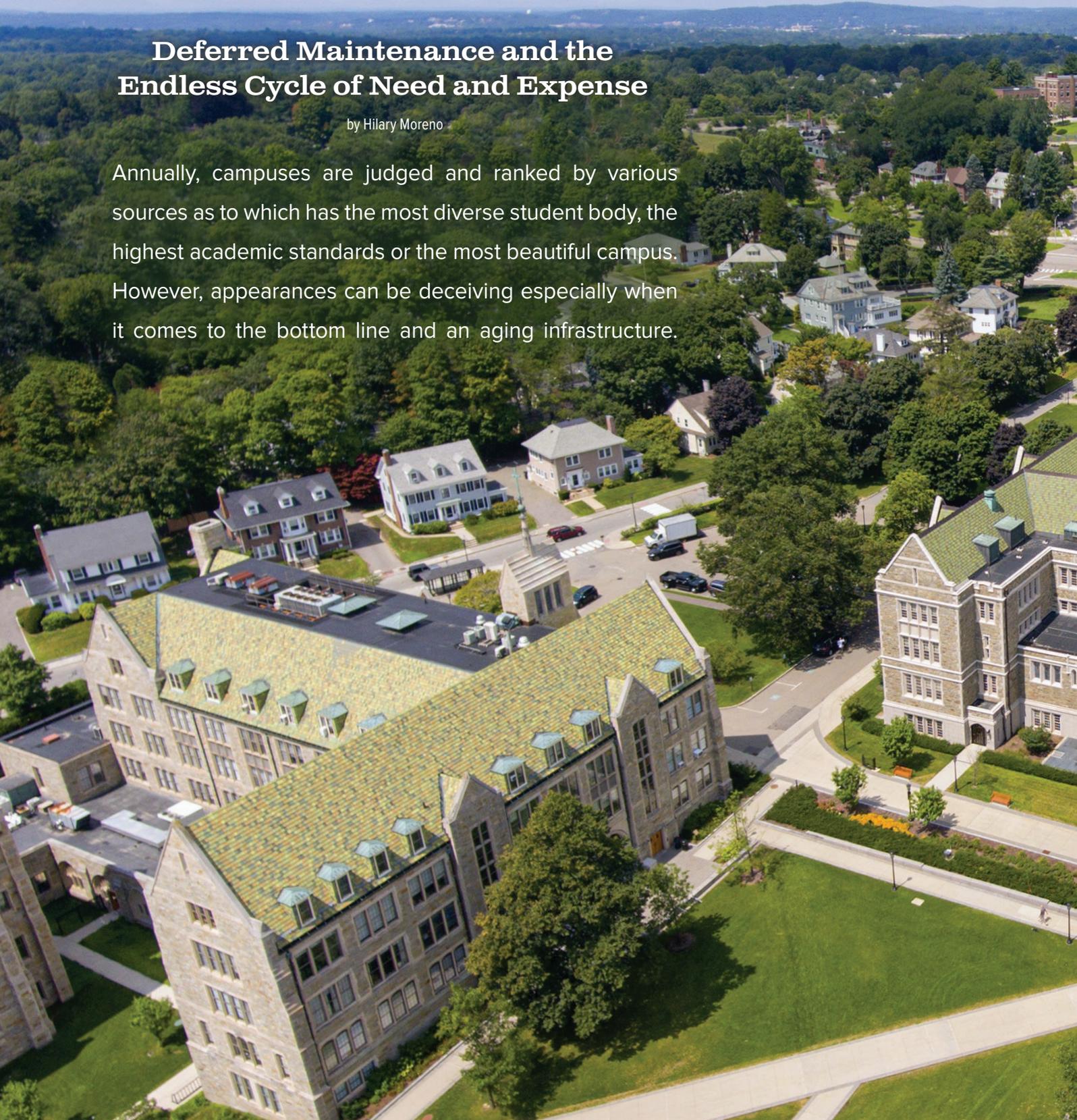
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Deferred Maintenance and the Endless Cycle of Need and Expense

by Hilary Moreno

Annually, campuses are judged and ranked by various sources as to which has the most diverse student body, the highest academic standards or the most beautiful campus. However, appearances can be deceiving especially when it comes to the bottom line and an aging infrastructure.





Twice in the past 75 years there's been a construction boom on campuses. From 1960 to 1975 there was a spike in enrollment due to veterans returning home and enrolling in college, a rise in high-school graduates, and greater competition between public and private universities for the same students. During this time around 40% of the buildings on current campuses were quickly constructed to support the influx of students. Then again in the post-recession years from 2009-2012, new construction increased to meet the demands of diverse program offerings and amenities to attract and retain high-quality students and faculty.

Over the years these waves of necessary construction have stretched many campus budgets beyond capacity. As is the habit of time, new construction will eventually require renovation. Buildings that are 25 years and older will need to have big-budget items such as roofs, electrical systems, exteriors, HVAC units, and plumbing replaced or repaired. Additionally, new building code safety requirements and ever-changing technological advances needed in existing buildings also vie for priority funding.

Deferred maintenance is the system of delaying maintenance projects with the intent of saving money, meeting budget funding levels, or realigning available financial resources. Sightlines "2018 State of Facilities in Higher Education Annual Report" states, "It is crucial for institutions to square their campus growth ambitions with their financial realities to make certain they can afford the longterm costs associated with maintaining their existing institutional assets and today's ongoing expansion. Their survival may depend on it."

The Never-ending Cycle

As stated by the EAB, a best practices firm that uses research, technology, and consulting to address challenges within the education industry, there are three interdependent stages of maintenance that can create a never-ending cycle of need and expense if not overcome through careful foresight and planning. As the list of deferred maintenance projects grows, there is an increased probability that a major system will fail sending the issue into a reactive maintenance state that must be immediately

addressed. While fires are being extinguished, preventative maintenance is often put on hold which in turn leads to the likelihood of further deferred maintenance costs.

The combination of decreasing student enrollment revenue and reductions in state funding aligning with low-interest rate loans has created a steady buildup in college debt over the past 30 years. With each new construction project, universities should consider the estimated 25 to 35-year maintenance costs in their initial funding request.

With new construction and budget-cutting often being examined simultaneously, many campuses have seen a reduction in maintenance and custodial personnel, further hampering the college's ability to discover and repair small problems before they become costly emergencies. Sightlines, a higher-education facilities consulting firm, explains this loss of custodial and maintenance employees can be somewhat off-set through the adoption of building automation technology, the hiring of workers with specialized training, and contracting with outside companies for specific needs on a temporary basis.

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—SIGHTLINES' "2018 STATE OF FACILITIES IN HIGHER EDUCATION ANNUAL REPORT"

Handling the Growing Backlog

The challenge facing universities across the country is how to manage the growing backlog of deferred maintenance issues. Where does the funding come from? How do you prioritize projects? Or, as Jon Marcus remarks in “Long-neglected Maintenance Threatens to Further Escalate the Cost of College,” how do you convince donors that “\$1 in maintenance today avoids \$3 in resoration costs later?”

It's more enticing for donors to fund a new wing of a science building than to cover the cost of re-roofing the current student center, but when campus facilities are comfortable, safe,

and modernized to meet the needs of students and faculty, the campus furthers its educational mission, suggests Nancy Mann Jackson in “Balancing Act,” an article from *Business Officer*, a publication which addresses current challenges and emerging issues in higher education finance and administration. Jackson states, “The return on investment is positive, not only because of the energy cost savings but more importantly, because people must be comfortable in order to teach and learn.”

In 2010 Washington and Lee University initiated extensive renovations to five of its historic buildings designated as National

Historic Landmarks. Fifty-million dollars was raised to make upgrades such as new fire alarms, sprinkler systems, elevators, automatic door openers, and handicapped-accessible toilets along with a new electrical system able to support the latest technology.

Jeff Hanna, in “Payne Hall Restoration: A Marriage of Old and New,” shares that Payne Hall was outfitted with fiber optics, classrooms and offices were enlarged to encourage student/teacher interaction, and corridors and stairways were altered to improve the flow of people.

With the installation of storm windows and eco-friendly smart lighting, utility costs dropped significantly. In an attempt to lessen possible deferred maintenance costs, Washington and Lee put 15% of the money raised into an endowment to cover the cost of regular maintenance.

Randolph Hare, Washington and Lee's director of maintenance and operations, said, “It sends a signal that we're good stewards of the facility and concerned about the life of the building and maintaining it.”



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Transparent Tracking

Many colleges have created extensive facilities and maintenance databases to research, catalog, and track deferred projects. Transparency with stakeholders allows everyone to be involved in the decision-making process from start to finish while helping keep the focus on the longterm strategic priorities and ensuring funds are being allocated as they were intended.

By providing administrators, professors, and patrons some level of informational access to desperately needed high-budget maintenance requests colleges can illustrate how specific demands in one area on campus compare in urgency with other requests. This allows for project prioritization when determining the overall cost while keeping lines of communication open.

Formidable but Attainable

Many colleges are looking at hundreds of millions of dollars in deferred maintenance costs. The expense alone can be a singularly staggering number, but once projects are prioritized the work can be broken down into more achievable stages with funding goals set at attainable amounts.



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"It sends a signal that we're good stewards of the facility and concerned about the life of the building and maintaining it." — RANDOLPH HARE, WASHINGTON

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Projects can be categorized into long- and short-term needs, critical issues, and preventative measures and presented to multiple funding sources.

Opportunity to Go Green

Another incentive when reaching out for capital is the current focus on going green. "The most efficient or green building is the one you do not need to build because you are using your space effectively, which drives investments in renewal to improve the effective use of space," offers Darryl Boyce of Carleton University.

In some cases, universities are even closing down older buildings that have become more of a liability than they are worth or are no longer able to safely meet program demands. By reducing the amount of space that needs to

be heated, cooled, and cared for colleges can reallocate that money into the improvement of younger, healthier buildings.

It is often easier to convince capital lenders and donors to invest in creating a sustainable campus environment. The over-arching support from students and faculty for advancing sustainability initiatives also fosters a sense of community—that leadership values programs and policies that impact the quality of campus life and beyond. Some private universities include annual capital renewal fees in tuition costs and those may be more tolerable if tied to green initiatives.

The Office of Energy Efficiency & Renewable Energy offers universities Energy Savings Performance Contracting (ESPC) options. This is a budget-neutral path to making improvements to existing buildings that will decrease

energy and water use while increasing overall efficiency. Colleges can work with an energy service company (ESCO), and use an ESPC to pay for time-sensitive upgrades with future energy savings.

According to Sightlines, positive trends in capital investment and stewardship funds have increased by 50% in the past 12 years. It is clear that there is far-reaching support for building renovation needs. By compiling an accessible database on the condition of campus buildings and utilities, updating information on maintenance projects and cost, and keeping donors, students, leadership, and faculty in the loop colleges can begin to surmount the backlog of deferred maintenance projects. Identifying, prioritizing, and addressing infrastructure issues as they occur strengthens the sense of community and forwards the educational mission.



ABOUT THE AUTHOR: Hilary Moreno is an alum of Birmingham-Southern College. Currently, she is the Creative Director and a staff writer for Flaherty Media.

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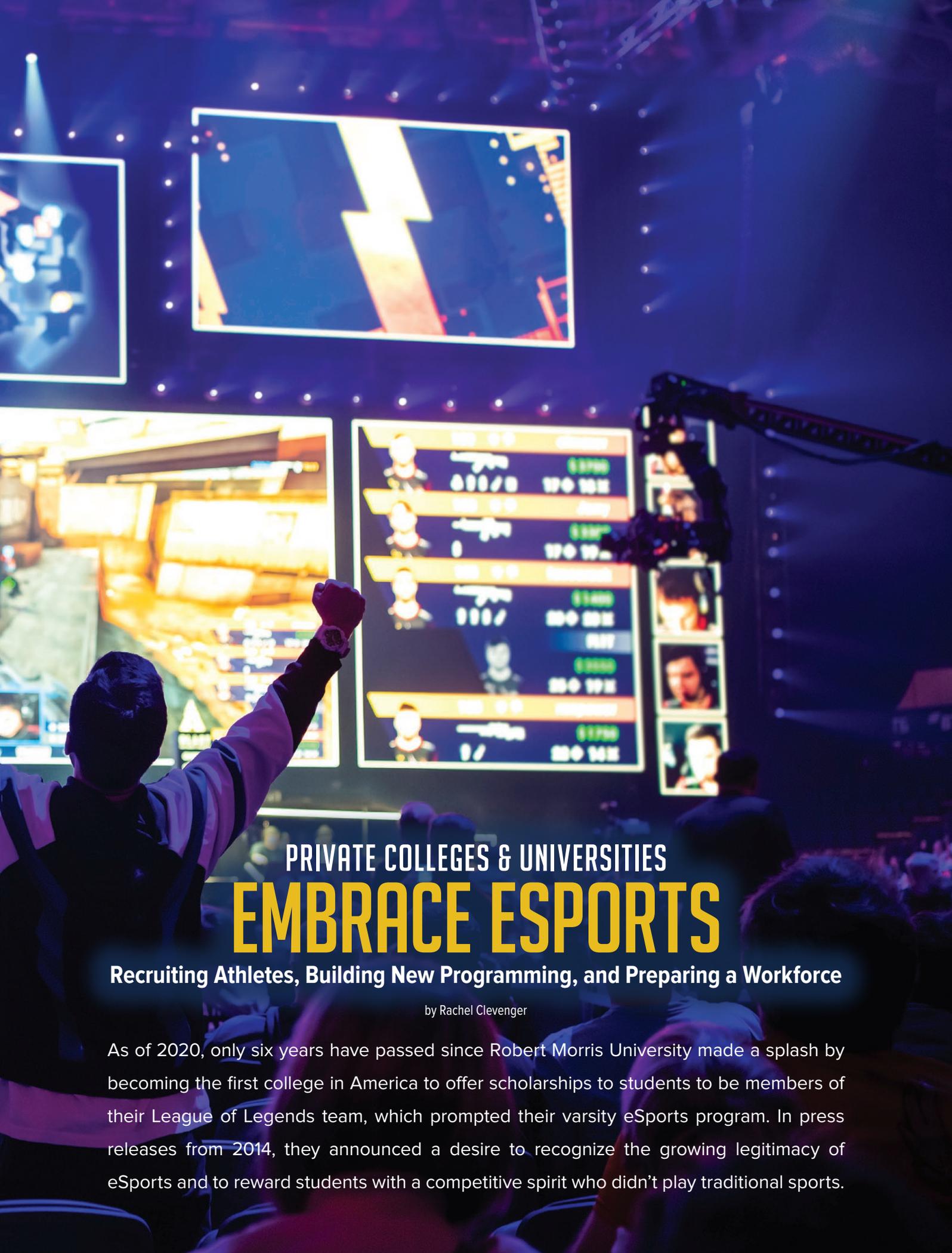
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Robert	10	2	1	0	0





PRIVATE COLLEGES & UNIVERSITIES EMBRACE ESPORTS

Recruiting Athletes, Building New Programming, and Preparing a Workforce

by Rachel Clevenger

As of 2020, only six years have passed since Robert Morris University made a splash by becoming the first college in America to offer scholarships to students to be members of their League of Legends team, which prompted their varsity eSports program. In press releases from 2014, they announced a desire to recognize the growing legitimacy of eSports and to reward students with a competitive spirit who didn't play traditional sports.



“That’s Not A Sport”: RMU eSports Team Earns Corporate Partnership

In the last few years, RMU has turned into a powerhouse with remarkable facilities. RMU Associate Athletic Director Kurt Melcher, who was in charge of the newly developed program at its inception, explained that the feedback he received from both sides was interesting: Gamers felt like they had finally been vindicated, and those on the side of the “hardcore athletes” held a different position: “What do you mean? That’s not a sport?”

Robert Morris University is still breaking new ground in 2019, by brokering a corporate partnership with Mountain Dew AMP Game Fuel, a drink designed with gamers in mind. Deb Erdley, of the *Tribune-Review*, notes they likely gained their sponsorship by earning a spot among the final four of a national tournament, featuring a team that has almost 50 members who compete in eight games, and making a strong showing during their first years as a member of NACE. Erdley asks, “Can million-dollar coaching contracts, packed arenas and victory celebrations with players drenched in sugar energy drinks be far behind?”

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"Athletics, whether they're played on the field or online, provide opportunities for deeper learning; eSports provide students with a training ground to practice making rapid decisions, managing resources and expenditures, and working as a team. All of these skills are essential for the professions of the future." — DR. JORGE L. DÍAZ-HERRERA

NACE Consistently Adding Member Colleges

By now, most of us are familiar with The National Association of Collegiate Esports (NACE), a nonprofit membership association formed in 2016—one that is focused on advancing collegiate eSports, especially within the varsity space. The sole association for varsity eSports for universities and colleges, NACE currently boasts over 170 member schools and over five thousand student-athletes.

Robert Morris University was not the only school to jump into eSports during its infancy. In 2014, two years before NACE was officially formed, The University of Pikeville became the second college to include eSports among their varsity athletics, and they started offering eSports scholarships the following year. At UPike, as with more-traditional athletic scholarships, students must maintain a minimum GPA and attend mandatory practice sessions. Keuka College founded its varsity eSports program in 2015. The

team benefitted from a \$2 million dollar network infrastructure. Keuka College president during this period, Dr. Jorge L. Díaz-Herrera, shared in a press release, "Athletics, whether they're played on the field or online, provide opportunities for deeper learning," he said. "eSports provide students with a training ground to practice making rapid decisions, managing resources and expenditures, and working as a team. All of these skills are essential for the professions of the future." Also founded in the fall of 2015, Kansas Wesleyan University's program was successfully competing against teams from larger schools and built a state-of-the-art facility for eSports.

The eSports program at Maryville University in Missouri, which started in 2015, became a significant contender in college eSports when they won Dreamhack's 2016 League of Legends championship. Their Director of eSports, Daniel Clerke, noted at the time, "ESports is the biggest thing that nobody knows about. To put it in perspective, the League of Legends World Championship last year was viewed by more people than every sporting event except the Super Bowl, and that includes the World Cup."

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“Video gaming just as impressive...as excellence in traditional sports”: Columbia College’s Enthusiastic Leadership

Columbia College is another of the earliest proponents of eSports. After a videogame challenge with his students in 2014, with a year of free textbooks on the line if they could beat him in *Madden NFL*, Columbia College President Scott Dalrymple was inspired to start their program. In a 2015 press release, as they announced eSports coming in 2016, Dalrymple offered this enthusiastic praise for eSports: “eSports aren’t the future. They’re the present. True skill at video gaming is just as impressive—and just as legitimate—as excellence in traditional sports.” In 2019, the Columbia College Athletic Department announced the hiring of Doruk Hacıoglu as the head eSports coach. Hacıoglu notes he had been following the program since its inception, and he was seeking a place with the values he shared, in terms of long-term development with the players. “The main focus for the program isn’t only to win,” says Hacıoglu, “but to develop talent while also allowing these players to pursue their academic career and get a degree.”

“It links well with a liberal arts education”: A Few Other Institutions Joining the Game

Though some of the earliest proponents of eSports have had their stories shared by multiple outlets, there are many private colleges and private universities that have started programs, developed facilities, and started recruiting athletes and coaching staff. Though certainly not all are represented in this column, the following is a broad overview of just a few of those institutions who have grabbed this opportunity over the last few years.

In the fall of 2016, Nebraska’s Midland University opened up their varsity eSports program, and Southwest Baptist University in Missouri created their eSports program in an effort to engage new groups of students who weren’t active in other clubs or groups on campus.

Ohio’s Lourdes University introduced a varsity eSports program in 2017. The new university president at that time, Mary Ann Gawelek, sought to take Lourdes in new directions, and she was a strong advocate for the program since she took office. Gawelek noted, “In order to participate in eSports you have to have the mental ability and critical thinking skills to do game-playing in general, you have to have developed the ability to function on a team, and you have to have a competitive nature that drives you toward success...It links well with a liberal arts education.”

In the fall of 2017, Tiffin University launched their varsity eSports program, complete with a dedicated eSports facility. Also in the fall of 2017, Stephens College in Missouri became the first all-women’s college to have a varsity eSports program.

“eSports puts an exciting, innovative, unique spin on competition”: New Facilities, New Scholarship, and New Interests

Illinois Wesleyan University began their program, and offering partial scholarships, in the fall of 2018. In 2017, they hired Callum Fletcher to build the new program and coach the players. In a press release that year, they shared that Callum—as an event manager—had helped organize and run the world championship for Big Buck Hunter, which featured over \$100,000 in prizes. IWU also constructed an impressive eSports campus facility.

Ohio’s Ashland University offers a varsity eSports program, and eSports teams hold practices in the school’s on-campus facility. They also host guest speakers, mostly professional players, to speak to athletes in seminars. In Southwestern’s varsity eSports program, they provide potential athletes with options of becoming grant recipients within two subcategories: competitors—who play on the team—or participants—who assist with stream management and event management.

Trine University in Indiana launched its program in the 2017-2018 school year. In 2018, they finished construction on the MTI Center, which houses their bowling and basketball facilities and all varsity teams, including a state-of-the-art eSports facility. Assistant Vice President for Athletics, Matt Land, noted, “ESports puts an exciting, innovative and unique spin on competition that will allow us to address the new interests of our students.”

“eSports represents significant growth potential”: Student Recruitment and Student Retention

The University of Jamestown created its eSports team in the fall of 2017, and The Jimmies compete in NACE’s League of Legends, Hearthstone, and other games. Lees-McRae College’s eSports program is one of the newest in the nation. Additionally, King’s College announced its plan to enter the eSports arena in fall 2020. Associate Vice President Cheryl Ish shared in a media release, “Coupled with the college’s other men and women sports, eSports represents a significant growth potential in attracting and retaining students.”

Ish further noted their plan to “add another dimension to the landscape of extracurricular offerings for our students” in the form of eSports in the hope of getting out “in front of the eSports movement that’s evolving on scholastic and college campuses nationwide.”

King’s will join NACE, as one of its more than 170 member institutions. Once King’s has been added, NACE will have nine Middle Atlantic Conference Schools, including Misericordia University, Stevenson University, Arcadia University, Lebanon Valley College, DeSales University, Albright College, Hood College, and Widener University.

In “Leveling Up Esports on Campus” in *Inside Higher Ed*, Lindsay McKinzie wrote in October of 2019, “Colleges don’t need fancy arenas or hundreds of high-speed computers to launch eSports teams, but they do need engaged students.” McKinzie argued that eSports facilities are fast becoming must-haves on campus, citing the 2019 Educause conference, where dozens of IT leaders referenced introducing eSports at their colleges.

McKinzie suggests that student recruitment is also playing a significant role in college administrators’ decision to introduce eSports. McKinzie references Jackie Stampalia, Rensselaer Polytechnic Institute’s Director of Client Information Services, who said, “RPI has offered video game design classes for more than a decade, but the push to support eSports came from students.”

“It’s a growing industry, in which money is made”: Presidents Must Make Firm Commitment to Value of eSports

In July 2019’s issue of *Education Dive*, Julie Wootton-Greener advises colleges to expand their eSports programs to keep pace with this industry. Wootton-Greener adds, “Online gaming is poised to generate \$1.1 billion in revenue globally this year, spurring colleges to add curricula teaching students how to work in the field. It’s a growing industry, in which money is made from activities such as streaming, franchising and sponsorships.” As she explains, as these programs expand, more institutions are teaching students how to work in this field—through full degrees, courses, or certificates—and with focuses on marketing and broadcasting, business management, or team development.

Last fall, for instance, Becker College started offering a B.S. degree in eSports management, and this fall they are launching a second bachelor’s degree in eSports, one focused on content management and emerging media. All of their eSports classes connect to Becker College’s business department and are taught by industry leaders, using project-based learning. Finally, Becker is offering a free summer program geared to high school students that’s an overview of eSports Management, targeting students from underserved backgrounds. From a slightly different angle, Syracuse University launched the course eSports and Media just last year, where students cover live broadcasting, the history of eSports, and develop marketing plans.

Wootton-Greener also cites Kevin Mitchell, who is the Director of Business Development and Strategic Intelligence at National Amusements, as well as an adjunct professor for eSports classes at Emerson. Mitchell notes there are outstanding opportunities in eSports, but not the skilled workforce to fill those positions.

For colleges that want to develop their curriculum, Mitchell believes that engaging administrators is key and suggests the most significant obstacle colleges face when implementing their programming is awareness that eSports is viable. Ian Ritacco, dean of Becker’s School of Design and Technology, seconds that argument, adding that university and college presidents who don’t have a strong grasp of eSports, as well as a firm commitment to the value of eSports, could hamper effective program development.



ABOUT THE AUTHOR: Dr. Rachel James Clevenger earned her M.Ed. degree from Mississippi College. After finishing her PhD in Composition and Rhetoric, she taught and served as the University Writing Center Director for Birmingham Southern College and University of Alabama at Birmingham. Most recently, she taught Business Communications at Samford University.

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THE MARATHON

THAT STARTED IN LYNCHBURG

Before she made history in Boston, Kathrine Switzer was inspired by a coach and classmates in Lynchburg.

by Bryan Gentry

Leather shoes scraped the pavement behind 20-year-old Kathrine Switzer. She turned to see a fierce, angry face just inches from her own. A man in business attire grabbed her shoulders and tried to pull her out of the Boston Marathon.



Photo courtesy Boston Herald

“Get the hell out of my race, and give me those numbers,” he said, and he tried to swipe the bib with the numbers “261” off her shirt.

Switzer’s heart, already racing, jumped into overdrive. Cameras on a nearby press truck clicked at a feverish pace, capturing her fear as race director Jock Semple kept hold of her. Then Switzer’s boyfriend charged and knocked the man down.

That image is etched into sports history. Switzer

was the first woman to run the Boston Marathon as an official entrant. The photos that headlined newspapers around the country the next morning made her an unintentional leader in the women’s sports movement.

It was made possible by a moment with much less fanfare, almost exactly a year earlier, when a Lynchburg College coach asked Switzer to join the track team.

Magic

A couple of days before Commencement 2019, Natalie Deacon ’17 found out that she had a chance to meet Switzer, one of her idols.

Switzer was in town to give the University of Lynchburg Commencement speech, and Deacon was invited to help interview Switzer on “A Smarter U,” the University’s podcast. So Deacon picked up a copy of Switzer’s autobiography, “Marathon Woman,” to start reading about Switzer’s role in the women’s running revolution — breaking the gender barrier in Boston, getting the women’s marathon added to the Olympics, and inspiring thousands of women around the world through her nonprofit, 261 Fearless.

Not only does Deacon admire Switzer’s athletic accomplishments and gutsy determination, but the two share a special connection: Deacon was the last woman to run under the Lynchburg College name, having competed in the national track championships just before the school became University of Lynchburg. Switzer was the first.

When they got together to record the podcast, Deacon’s first question related to the book. “One of the parts I really liked, you said, ‘When I ran, I felt like I was touching God or he was touching me,’ and then you talk about this magic that you felt when you ran,” Deacon said. “Could you tell us a little bit about that concept of the magic?”

“I couldn’t quite figure out what it was,” Switzer said. “But I still feel it.” She said it could be a sense of connection to the natural world, or the release of endorphins. “And also the sense of accomplishment, so when everything else in life is totally unmeasurable, ... at least with the run, you’ve gotten something accomplished. You’ve done it for yourself.”

Switzer began running as a preteen in Northern Virginia when her dad encouraged her to go out for field hockey rather than cheerleading. “Life is not about spectating,” he told her.

“He said, ‘I don’t know what field hockey is, but I know they run and you should go out and run and make that team,’” Switzer said.

The magic feeling of running grew into a love for sports in general. Switzer nurtured her own athleticism. Since girls teams didn’t get much media coverage at the time, she decided to become a sports journalist and fix that. In 1964, she came to Lynchburg College to play field hockey, basketball, and lacrosse. And she became sports editor of The Critograph, the student-run newspaper.

One rainy day in the spring of her sophomore year, Switzer was dashing around the track when she noticed Aubrey Moon ’56, coach of men’s track and a few other sports, watching her. When Switzer finished running, he approached her.

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Photo by John McCormick / University of Lynchburg

"Kathy, can you run a mile?" he asked in a southern drawl.

"I can run three miles!" Switzer boasted. Moon asked her to help the men's track team by running the mile race in an upcoming meet.

"Well, I'll probably finish last," Switzer said.

She recalled Moon saying something like, "Sure, you probably will finish last," but finishing last was fine—the team would get points as long as she stayed in the race to the end.

The spring of '66 was a tough season for Lynchburg College track. According to local newspaper archives, 11 potential track stars had been cut because of grades, leaving only 16 men on the team, including what the reporter called "six untried freshmen." Moon needed all the participation points he could get.

"Sure coach, put me in," Switzer said.

Moon also asked Martha Knewel, one of Switzer's field hockey teammates, to join the team. Wayne Prince '68, whose knack for dunking the basketball had earned him a place on the track team, said he and other teammates were happy to have Switzer on the roster.

"Lord knows I couldn't run the mile anywhere near what she was doing," Prince said. "It didn't even cross my mind that there was a male-female barrier there. It's crazy to think that a girl coming out for track would be a big deal. But it was then."

Hundreds of spectators and many reporters showed up for Switzer's first track meet. She ran the mile in just under six minutes, finishing last, as expected. Newspaper articles published at the time focused on her physical appearance as much as they did on her running. One paper

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Photo courtesy Boston Herald

quoted her measurements and reminded readers she would be putting her figure on display in the upcoming Miss Lynchburg beauty pageant.

Switzer said she and Newel received some “weird mail” from people criticizing their choice to run, claiming it was dangerous. “Surely your uterus would fall out and you’d become a man,” Switzer said, summarizing some of the bizarre comments. Some letters also accused her of setting women back by sweating in public.

But Coach Moon supported them. At the end of the season, he awarded varsity letters to Switzer and Newel. “Coach Aubrey Moon gave me my first steps,” Switzer said.

Marathon Time

About a week before Switzer’s first track meet, three Lynchburg College students ran in the Boston Marathon. One had to drop out of the race with a sprained ankle, but the other two finished in three hours, 45 minutes.

Switzer interviewed them for *The Critograph* when they returned. Only then did she realize that a marathon was 26.2 miles. She was enthralled. She bet she could do well in a race focused on endurance rather than speed.

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“Were there any girls running?” she asked Robert Moss, one of the runners.

“One,” he said.

“What did she run?” Switzer asked.

“A 3:20.”

“What? You let a girl beat you!” Switzer said.

The woman in the 1966 Boston Marathon was Roberta “Bobbi” Gibb. After race officials refused to let her register for the race, she had stood on the sidelines near the start and jumped into the fray as the men trotted past.

Learning about Gibb sparked an idea in Switzer. “I thought, ‘Well, that’s interesting. A woman has done it, and she ran pretty well. She outran Robert Moss. Obviously women can do it.’”

By that time, Switzer had taken all of Lynchburg’s journalism classes, so she transferred to Syracuse University that fall to chase her sports journalism dream. She found a very different reception to her desire to compete athletically.

“There were no intercollegiate sports at Syracuse for women. None,” Switzer said. “They had 25 sports for men.” (According to a Syracuse University history timeline, it wasn’t until 1975 that the school formally recognized five women’s teams.)



Aubrey Moon, the coach who invited Kathrine to run at Lynchburg.

Photo courtesy University of Lynchburg Archives

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Switzer assumed she would just run solo. “But then I decided, if Coach Moon let me run on the men’s team, maybe they’ll let me run on the men’s team here,” she said.

The Syracuse cross country coach told her that NCAA rules forbade her from competing, but she was welcome to work out with the team. As she closed the coach’s office door, she heard him laugh and say, “I guess I got rid of her!”

At the practices, Switzer connected with Arnie Briggs, an older assistant coach who was thrilled to run with someone who wouldn’t outpace him. He talked a lot about the Boston Marathon, and eventually Switzer said she wanted to run it. Briggs doubted that a woman could safely run the distance. But he agreed to help her train, and he promised to take her to Boston if she proved she could complete it.

After proving herself on a 31-mile run, Briggs insisted that Switzer officially register and receive numbers for the race, rather than sneak in the way Gibb had done. The rule book and entry form didn’t mention gender. It was just assumed that women would not sign up. So she signed “K.V. Switzer” and showed up on race day ready to run.

After the attack by Semple, Switzer’s emotions ebbed and flowed with fear, embarrassment, and anger. Then determination took hold.

“I turned to my coach and said I was going to finish this race on my hands and my knees if I had to,” she said. “I was just so determined because I knew if I didn’t, nobody would believe women could do it.”

After more than four hours of running through snow and freezing rain, the finish line was anticlimactic. Switzer was already thinking about the next race and how she could train more. She didn’t dwell on the incident with the race director. “We didn’t think that this was any big deal at the time,” she said.

But around midnight, her group stopped for gas and coffee on the way back to Syracuse. There, Switzer saw her picture on the front page of a newspaper.

The conflict with the race director was completely different than she had imagined.

“This wasn’t an isolated incident,” she said. “This has been flashed around the world. This was going to be on the pages of major newspapers.

“During the race, I kept wondering, ‘Where are the other women? Why aren’t more women here?’ And then it was like a ‘duh’ moment—they’re not here because they’re afraid and they haven’t had the opportunity to disprove the myths that were limiting them, that made them afraid.”

There she was on the front page of the paper, a frightened look on her face, disproving the myths that a woman couldn’t run, even as a man physically tried to stop her.

She knew her newfound notoriety came with a duty.

“I felt very, very responsible now for taking that forward and doing something with it,” she said.

“The Marathon that started in Lynchburg” first appeared in the University of Lynchburg Magazine in October 2019. The podcast interview referred to in the story can be heard at www.lyncburg.edu/podcast.



ABOUT THE AUTHOR: Bryan Gentry is a lifelong storyteller and writer and currently serves as the director of communications at the University of Lynchburg. On the side, he makes puns and writes fiction for children and young adults. Follow him on Twitter at @brygentry.

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Major Industries manufactures energy-saving skylights, translucent wall systems and canopies that fit a wide range of applications and budgets. Major is also the only manufacturer to offer three distinct translucent panel daylighting systems: value-driven LightBasic™ systems, Guardian 275® skylights and wall systems that offer numerous system options, and Clima-Tite™ systems with pultruded fiberglass

framing for enhanced thermal performance and corrosion resistance and a unique snap-to-lock installation feature that eliminates the need for unsightly visible fasteners. For more information about Major Industries' full line of daylighting systems, call 888-759-2678, email us at info@majorskylights.com or visit our website.

OVERLY DOOR COMPANY
<http://door.overly.com>

Overly Door Company is a custom specialty door and window manufacturer. Industry leading Architects utilize our products to achieve the exact specification their facility requires. We provide many "out-of-the-box" solutions for your standard needs. We also specialize in custom barrier systems. Specify Overly Door Company for all of your standard or custom needs.

SPECIAL-LITE, INC.
www.Special-Lite.com

Special-Lite has manufactured exterior doors and frames for the educational and institutional market since 1971. Our long lasting, low maintenance required entrances save facility managers' time and costs by providing high performance entrances—even when installed in the most demanding of locations. They are perfect for new or renovation projects. We build to order and have many door types: all fiberglass door & frames, frp/aluminum hybrid flush door, aluminum flush door, frp woodgrain or colonial flush, and medium or wide stile and rail doors. We have HVHZ entrances and doors/framing that meet and exceed the ASHRAE Standard. Also, try Special-Lite FRP Toilet Partitions and Omega® Interior Aluminum Framing and Door.

STAGING CONCEPTS
www.stagingconcepts.com

Staging Concepts is the industry leader in portable staging equipment. Staging Concepts performing arts staging systems and products are designed to maximize any venue. We specialize in building modular stages to seamlessly look and feel permanent. Our customization options can maximize the functionality of your space while giving you the capability to choose a system that perfectly matches your venue. Our equipment is of the finest quality, requiring no tools, making it easy and efficient for set-up and take-down. Performing art centers, theatres, auditoriums, and other performance facilities demand durable and high-quality equipment for their venues—and Staging Concepts can perfectly fulfill this need. Whether it is a small portable stage for a choir room, orchestra pit filler for a theatre, or flexible seating risers for a black box, Staging Concepts will provide the ideal equipment to match the project.

FLOORING

AMERICAN BILTRITE
www.american-biltrite.com

American Biltrite manufactures and distributes commercial flooring and industrial rubber throughout America. Our flooring segment primarily serves architect designers in the healthcare, educational and institutional sectors, while in industrial rubber we supply other companies with the materials they need for a host of applications. Between the two there is excellent synergy in R&D, technical expertise and product innovation. Through nearly a hundred years of careful growth, American Biltrite has built a reputation for the quality of its products and the sincerity of its commitment to customer service. With ISO 9001:2008 since 1996 and ISO 14001:2004 since 2011, FloorScore certification and products which help meet the LEED requirements, American Biltrite continues to improve its processes and products.

FORBO FLOORING SYSTEMS
www.forboflooringna.com

Create beautiful, durable, healthy learning environments with Forbo Flooring Systems. Forbo's Marmoleum Composition Tile (MCT) is made from natural raw materials with inherent anti-static properties that repel dust, making it

easier to maintain a healthier environment for students and staff. MCT is naturally free from PVC, phthalates, pesticides, and other harmful additives. It's sustainable, water-based Topshield 2 finish provides occupancy-ready installation and exceptional performance against soiling, staining, scratching, scuffing and squeaking. Forbo's Flotex Modular Tile combines the function and durability of a 100% waterproof, high-performance carpet, with the beauty and versatility of a 10"x40" modular tile. Flotex Modular Tile provides a warm, comfortable, hygienic flooring solution that is well-suited for dorms, classrooms and dining areas.

KALWALL® CORPORATION
www.kalwall.com

Kalwall has been providing museum-quality daylighting™ to building occupants all over the world for more than 60 years. Company founder Robert R. Keller, Sr. invented the original translucent sandwich panel in 1955, and no other company has dedicated more years, resources, creativity and innovation into the science and art of daylighting. Kalwall is the most highly insulating, diffuse light-transmitting, structural sandwich panel in the world. Lightweight, shatterproof, and rapidly installed, Kalwall has unrivaled structural integrity that is far superior in performance and value to products that superficially may appear similar. Kalwall can be all or part of the walls or roof of any building or be an entire freestanding structure. Typical product applications include: Wall, Window Wall and Curtain Wall Systems, Window Replacement energy upgrades, Skylights, Pre-engineered and Custom Skyroofs®, Clearspan™ Systems and Canopies+Walkways.

MUSSON RUBBER
www.mussonrubber.com

For over 65 years, Musson Rubber has been a pioneer and leader in the development, manufacture and distribution of safety stair coverings and flooring materials. Musson Rubber specializes in stair coverings and entrance matting for commercial, institutional and industrial use. Herein lies the most complete and comprehensive line of top quality rubber and vinyl stair coverings and entrance mats for use in public buildings. Musson is also a major distributor of industrial rubber products. Representing over 100 different suppliers in major markets gives Musson the ability to provide competitive products and service in today's demanding environment.

NAC PRODUCTS
www.NACProducts.com

For more than 30 years, NAC Products has been an innovator of high-quality products for hard surface flooring and building applications. NAC membrane systems provide waterproofing, sound reduction, and crack isolation protection for residential developments like high rise condos, dormitories and hotels, and commercial projects like malls and airports. NAC membranes have been laboratory tested and exceed the industry standard for sound abatement, crack isolation and waterproofing membranes. NAC membranes have been featured in thousands of commercial, residential and industrial applications worldwide and are the #1 architecturally specified, owner/contractor preferred, and lab tested membranes on the market today. Membrane systems that protect your flooring investment, that's NAC Products!

NEW PIG
www.newpig.com

New Pig is the number one brand that helps companies manage leaks, drips and spills to protect workers, facilities and the environment. A multi-channel, multi-brand supplier, over 3,100 spill control and liquid management solutions and industrial maintenance products have been used in more than 300,000 industrial, commercial, utility, institutional, healthcare, military and government facilities in 70 countries. The leading New Pig brands include the Original PIG Absorbent Sock, PIG Grippy Floor Mats, PIG Spill Kits, PIG Spillblocker Dikes, and PIG Flammable Safety Cabinets. Other channels offering

PIG products include all Safety-Kleen branches, select Integrated Suppliers, and B-to-B E-Commerce exchanges. For more information, contact www.newpig.com. New Pig is headquartered in Tipton, PA.

WOOSTER PRODUCTS
www.woosterproducts.com

Make every step a safe one. Wooster Products is a USA Manufacturer of anti-slip safety stair and walkway products. We manufacture products for any size project. In operation since 1921, our work includes transit stations, stadiums, schools, parks and residential and office towers. Our brand names include the following: Stair-master® is a renovation or safety enhancement products for heavy pedestrian traffic; Walk-A-Sured® is water Clear Epoxy floor coating designed for use on wood, metal, tile, marble, terrazzo and concrete.WP-70® is a heavy-duty two-part epoxy coating for a long-lasting, anti-slip durable solution; FlexTred® is our anti-slip tape used for stairs, walkways, ramps and more. Please contact us at 800-321-4936.

FURNITURE

BEVCO SEATING
www.bevco.com

Proudly manufactured in the USA for over 70 years, BEVCO's ergonomic seating solutions are the perfect blend of quality, comfort and affordability. BEVCO's products are an excellent choice for a wide variety of applications within the higher education space ultimately making the difference in how you perform on a daily basis. Experience the BEVCO difference: Our made-to-order customization process ensures you're building a product that meets your exact needs; the 12-year warranty provides you with peace of mind while protecting your investment; our core line of products have been GreenGuard Gold certified offering sustainable solutions contributing to your overall wellness; and the unparalleled support ensures you are always 100% satisfied with your BEVCO seating experience.

EUSTIS CHAIR
www.eustischair.com

Eustis Chair designs and manufactures the most durable, sustainable, stacking and non-stacking hardwood chairs and barstools in the world. This bold statement is only possible thanks to our proprietary joinery system called the Eustis Joint® that creates chair joints that are unbreakable and will never need tightening or service. Every Eustis Chair is made to order in our Western New York factory and is highly customizable. Each Eustis Joint® chair comes with a 20 year warranty against joint failure, where all other wood chairs break. View our website to learn more and contact us to discuss your next project.

FALCON-THONET
www.falconproducts.com

Since 1959, Falcon has been the 'go to' resource for designers and architects who specify high quality, commercial-grade tables, chairs, booths, and modular seating. Falcon makes its products in the USA, in a 400,000 square foot manufacturing facility located in Newport, TN, a Federally designated HubZone. The Company's products are typically specified for Education, Corporate, or Hospitality environments and our well designed, high quality furniture is capable of withstanding the demands of the most active commercial space, providing the smart buyer with an industry-leading Life Cycle Cost. Our product line offers a broad range of standard tables and seating as well as a full range of custom capabilities in all our product categories.

HUSTON & COMPANY:
ACADEMIC AND LIBRARY FURNITURE
www.hustonandcompany.com

Each piece of custom furniture from Huston & Company is designed to enhance the aesthetics of its surroundings. Found in fine academic institutions and libraries, as well

as professional spaces from government buildings to small businesses, Huston furniture adds to the atmosphere of graceful permanence inherent in places of intellectual engagement, learning and professionalism. Huston & Company furniture is custom-designed and finished to withstand hard, regular use in public settings such as libraries, academic spaces and meeting/conference rooms. Each piece of Huston furniture will last for generations, while retaining its beauty, warmth and functionality, providing your school, library or office with longevity that equates to real value.

SPECTRUM INDUSTRIES
www.spectrumfurniture.com

Spectrum Industries Inc. is a niche furniture manufacturer that has a diverse product line consisting of lecterns, desks, collaboration tables, and charging solutions. The high-quality manufacturer has produced over 4,300 different products and can be found in any education, government, healthcare, or corporate setting. Headquartered in Chippewa Falls, Wisconsin, Spectrum has been connecting customers to technology since 1968. Spectrum innovates each product with quality, durability, and can stand the test of time with Spectrum's vigorous product quality tests. Spectrum has received ETL Certification by Intertek to UL 60950-1 listing and is ISO 9001:2015 certified. In addition, Spectrum has been honored with the SCS Indoor Advantage Certification. This certification verifies that Spectrum is compliant with ANSI-BIFMA, a furniture sustainability standard.

VARIDESK
www.varidesk.com

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people reimagine their work environment and transform their office design. We've made it simple to create a healthy, productive workspace that's as mobile, dynamic and adaptable as the people it supports. It encourages movement: Employees who move more during the workday are healthier, happier, and more productive. An active workspace creates a positive company culture that attracts the best talent. It's flexible and adaptable: As businesses grow and change, their furniture should scale along with them. Our products allow you to move, rearrange, add on, and create new spaces quickly and easily. It's easy to create: It should be simple for anyone and everyone to have an active workspace. What used to be complicated and expensive is now easy and affordable, but no less professional.

LANDSCAPING

BILLY GOAT INDUSTRIES
www.billygoat.com

Billy Goat Industries is the premier manufacturer of specialty turf products with a reputation for innovation, productivity, and quality. We offer a complete line of turf renovation and clean-up solutions for commercial and municipal needs serving landscape and grounds maintenance professionals. We carry Turf Renovation Equipment, including the most comprehensive line-up of Aerators on the US market, Hydro-Drive Sod Cutters, and Overseeders. In Clean-up Equipment, we have Outback® Brushcutters, a full-line of Vacs, Force™ Blowers, and Debris Loaders: 13, 14, 18, 25 & 35 HP. Dual shredding system with Pirana™ blade for the best reduction of any debris loader on the market. Contact Gail Trudeau, Assistant Manager of Marketing, at trudeau.gail@billygoat.com.

GREEN EARTH COMPANY
www.thegreenearthco.com

We strive to create and provide the highest quality products, that are less harmful to the planet, at competitive prices, through chemistry and scientific research, for the benefit of today's consumer, as well as future generations.

MEAN GREEN MOWERS
www.meangreenproducts.com

Mean Green Mowers offer the electric advantage: There are four great advantages to using Mean Green's electric equipment over traditional gas-powered tools. They are zero emissions, low noise, zero gas, and low maintenance. Leveraging the Electric Advantage takes away the stresses of traditional gas-powered mowers. Without the harmful fumes, obnoxious noises, little maintenance, and no more trips to the gas station, there is now more time to focus on the actual job! Mean Green has taken the extra work out of maintaining the yard; simply flip the switch and cut the grass. Discover how the electric advantage can revolutionize your campus.

LIFE SAFETY/SECURITY

2WAY SUPPLY
www.2waysupply.com

Ensure safety and security with Motorola 2Way Radios from 2Way Supply, which offers instant communication solutions for small, medium or large facilities. 2Way Supply is an authorized Motorola dealer specializing in Motorola 2Way radios, parts and accessories. 2Way Supply recognized a need in the marketplace for an easy-to-use e-commerce site for Motorola accessories that featured low prices and a good selection of needed items for industrial, educational, construction, safety, and business clients. We also came to

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CEIA USA

www.ceia-usa.com

CEIA USA strives to educate our current and potential customers on the proper deployment of Metal Detector Security Technologies with the aim of achieving the best operational response. We will continue to increase our operational base of customers through education, seminars and trade shows and with continuous improvement in the technology offered. Our threat detection and screening systems take the guesswork out of security screening. Incorporating the latest in threat detection technology, CEIA sets the standard for safety, convenience and accuracy. The CEIA DIFFERENCE includes superior detection and throughput, exceptionally high discrimination of non-threat items, compliant with the strictest security standards, unmatched reliability, and walk-through, hand-held and table-top models to fit facility needs.

D&D TECHNOLOGIES

<https://us.ddtech.com>

D&D Technologies is the recognized leader in safety and hi-performance gate hardware globally providing the broadest range of gate hardware for every application. D&D Technologies produces over 300 gate hardware products and has 30 years of experience in the gate hardware industry. Products include MagnaLatch® magnetic pool and safety gate latches, TruClose® adjustable, self-closing

gate hinges, SureClose® the commercial grade hinge & closer, Shut It industrial hinges, LokkLatch® gate latches and Stainless Steel hinges and latches. D&D's diversity of products continually set new standards in design, performance, craftsmanship and innovation. D&D Technologies operates a fully accredited and internationally recognized ISO 9001 Quality Assurance System, which governs the design and manufacture of all our products. D&D products are rust free and consistently exceed all relevant safety barrier codes around the world for the residential, commercial and industrial markets, and are backed by a limited Lifetime Warranty.

THE DOORJAMMER LOCKDOWN

www.door-jammer.com

The DoorJammer Lockdown offers effective, industrial-strength security designed for the multi-room lockdown scenarios in schools, public buildings and institutions with no set-up cost after purchase. DoorJammer takes just seconds to fit to most doors and will prevent unwanted or forced entry immediately.

FJM SECURITY

www.fjmsecurity.com

For over 50 years, FJM Security Products has been offering high quality, innovative security solutions. Creators of the Combi-Cam product line (www.combi-cam.com), that ranges from economical combination cam locks to manager key override models to electronic, RFID and NFC models at competitive pricing. Combi-Cam allows convenient, keyless access and most models offer management access for lost codes and easy reset. FJM Security products also offers a patented locker combination padlock with management key override and code discovery. FJM Security offers excellent customer service and same day

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INCORD

www.incord.com

InCord is the leading provider of safety netting solutions for a wide variety of sports—from soccer, to lacrosse to baseball, and more. Products include custom field dividers, batting cages, backstops and field goal netting. InCord makes netting for team and spectator protection around fields, over stadiums and above dashers and bleachers. In addition to new construction netting, InCord can also design custom sports netting to existing structures and spaces to renew what you already have or add new, facility-enhancing netting solutions. Whether you're a facility owner, construction contractor, or facility director, InCord has exactly what you need—no matter the size of your

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NIGHTLOCK
www.nightlock.com

Whether it's a 400-room school, college dorm or office complex, NIGHTLOCK provides protection in just seconds for emergency lockdown situations. Teachers and employees simply drop the locking handle into the floor plate. Most lockdown policy procedures for classrooms include "barricading the classroom door," with items such as desks or furniture. Most state Fire Officials approve devices like Nightlock Lockdown. Many fire code officials now apply a variance in codes to allow these temporary barricade devices for emergency events. The NIGHTLOCK® Lockdown uses the strength of the floor to withstand tremendous force, and works on any outward- and inward-swinging doors. The NIGHTLOCK unit is installed at floor level, and remains out of reach to anyone attempting to enter by breaking window glass on conventional classroom and office doors.

RITRON
www.ritron.com

Ritron designs and manufactures industrial grade wireless communication equipment. The company's products are used around the world in a wide variety of data telemetry and voice communication applications. Ritron offers cost-effective wireless mass communication made simple. Proudly manufactured in the USA, Ritron has over 40 years of experience helping higher education facilities improve campus safety, security, and communications for students, faculty, and staff. You can learn more at www.ritron.com/bridge.

THORGUARD
www.thorguard.com

Thor Guard, the leader in lightning prediction, is committed to utilize emerging technologies in the development of systems that provide automatic notification of hazardous weather conditions. Thor Guard uses a highly sophisticated sensor and computer to measure and analyze the electrostatic field in the atmosphere. Lightning originates within this field, thus allowing Thor Guard to make calculations predicting its occurrence, even though there may be no visible evidence of lightning. Lightning detection systems require the occurrence of an actual lightning strike before a warning is given. Many times this is just too late. Many airlines, government agencies, and other industrial users are utilizing Thor Guard for this very reason.

VIKING ELECTRONICS
www.vikingelectronics.com

Viking Electronics designs and manufactures over 500 security and communication products; such as Emergency Phones, Entry Systems, Paging Interfaces, Amplifiers, Mass Notification Systems, Hot Line Phones, Auto Dialers, Enclosures, and more. In addition to our extensive analog line, we also offer a large selection of IP based solutions.

Viking's VoIP products are SIP compliant, with features such as built-in relays and automatic noise canceling. We are continually developing new ideas using the latest technology to expand our product lines. As always, Viking products are designed, manufactured, and supported in the USA and are backed by a two year limited warranty. Since Viking was started in 1969, we've been asking our customers to "Call Us First." So, the next time you're wondering if we make a product for a particular application, pick up the phone and call us. If we don't make it, we'll do our best to direct you to someone that does!

LABORATORIES

CARVER PRESSES
www.carverpress.com

Carver Presses offer more choices: Choose from two-column and four-column benchtop, floor standing, manual and automatic hydraulic and pneumatic presses with clamping capacities from 12 to 100 tons. Choose from Auto Series, Monarch Hydraulic Presses, Proppant Crush Test Press, heated and unheated manual presses, Pellet Presses, Pneumatic Low Force Presses, transfer presses, laminating presses and custom presses. Carver is a leading manufacturer and supplier of standard and custom presses used in laboratory applications such as pelletizing, lab testing, pharmaceuticals, liquid extraction, cell disruption, laminating, specimen preparation and other applications.

LABCONCO CORPORATION
www.labconco.com

Serving the scientific community since 1925, Labconco Corporation manufactures laboratory equipment, specializing in ventilation products such as chemical fume hoods and biological safety cabinets. Other product lines include



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freeze dryers and glassware washers. Labconco has ISO 9001 certification, one measure of its commitment to quality and consistency in design and manufacturing. Manufactured in Kansas City, Missouri, and Fort Scott, Kansas, Labconco products are marketed worldwide to academic, industrial, life science, pharmaceutical, environmental, forensic and clinical laboratories.

POLYSCIENCE
www.PolyScience.com

For over five decades, PolyScience has been an award winning American made innovator and manufacturer of liquid temperature control solutions focusing on the needs of laboratory, chemical, medical, industrial, and plastics markets with unparalleled innovation, passion and user-focus. Our dedication to quality, ease of operation, reliability and value has helped us become a global company that spans six continents. Our Refrigerated Circulators, Heated Circulators, Chillers, Recirculating Coolers, Water Baths and Application Specific Products are designed to simplify tasks, take less space, integrate more seamlessly and perhaps most important, make your work productive and enjoyable. Our products and manufacturing process continue to look forward as we innovate and create with the environment as a reminder of best practices. All of our products are designed and developed by a highly trained engineering team and manufactured to our own rigid standards. PolyScience has designed products with a focus on environmental stewardship.

LIGHTING

AEON SPORTS LIGHTING

www.aeonledlighting.com/sports-lighting

Enhance your luminaire for a lifetime with field changeable lenses, LED modules and drivers. AEON offers worry-free,

multi-option performance for years into the future. AEON Lighting offers heavy-duty, lightweight and durable die-cast design for high-wear resistance to withstand harsh, extreme outdoor conditions and corrosive environment. It is the most powerful sports luminaire with the highest reliability level: incredibly high 95% total efficiency and with the highest efficacy in its own class: 140 delivered LpW. more light with fewer luminaires. The proprietary thermal management design with passive cooling maximizes heat dissipation for a longer life of the luminaire and is designed for greater life expectancy in warmer climates. Our patented revolutionary aerodynamic design offers minimal drag in a state-of-the-art, aesthetically pleasant, compact design with no exposed electronics or wiring.

LIGHT EFFICIENT DESIGN

www.led-llc.com

Light Efficient Design is the industry leader in screw-in LED retrofit technology providing the highest quality and broadest product line on the market. Today we not only offer choices in retrofit technologies, including retrofit kits and pin base, but have expanded our product offerings to include feature-filled innovative RemPhos LED fixtures.

LUMENS

www.mylumens.com

Lumens Digital Optics Inc., a Pegatron Group company, is a leader in optical products. Lumens' product offerings include portable document cameras, desktop document cameras, a ceiling document camera, HD PTZ cameras, and projection engines. Founded in 1998, the company was created by a team with a deep technological heritage of image processing, video electronics, and optical technology. With the support of the Pegatron Group, Lumens is continuously improving product designs to be

used in classrooms, conference rooms, and for distance learning. Lumens' educational technology, including Document cameras, PTZ cameras, lecture capture system and wireless presentation system are aimed to create a student-centered interactive classroom allowing students to watch events happen in real time and catch up on lectures with recorded videos.

STERNBERG LIGHTING

www.sternberglighting.com

Since 1923, Sternberg Lighting has maintained its position as a leader in the street lighting industry by utilizing the latest technological advancements. Today, Sternberg Lighting again challenges the lighting industry with its innovations in engineering, design and manufacturing. Our energy efficient LED street lighting luminaires have set a new standard for municipalities, universities, utilities and commercial entities seeking energy costs savings. Sternberg Lighting's fixtures lead the industry by combining the vintage look of decorative styled luminaires with today's demands on sustainability and energy conservation. Sternberg Lighting offers the most complete family of traditional and architectural lighting, luminaires, poles, coordinating bollards, site amenities and landscape furnishings available in the industry today.

MAINTENANCE

AGF MANUFACTURING

www.purgenvent.com

AGF Manufacturing Inc. manufactures specialized products for the Fire Protection Industry and was founded on the principles of reliability, versatility, and compatibility. Over the years AGF has introduced a number of original products that accommodate the varying demands of the fire protection industry and we are continually working in the

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field to improve existing products and introduce new ones. While addressing the needs of fire protection, we strive to provide the best products backed by a strong commitment to customer service. Our close interaction with the fire protection community has helped us introduce a beneficial product line. By engineering more intuitive products, AGF helps you manage your fire safety systems more efficiently, resulting in more reliable systems that save resources.

DORLEN PRODUCTS INC. www.wateralert.com

Dorlen Products, a water leak detection company, has been manufacturing surface water leak detection equipment since 1975. Our water leak specialists are dedicated to selling the highest quality, lowest maintenance leak sensors available today. Our leak sensing systems are rugged yet sensitive to detect even a thin film of water... without false activations. Water Alert leak detection equipment is designed to maximize protection by having continuous monitoring 24/7. Our water line leak detection equipment detects small leaks such as condensate water overflow, chiller water leaks, plumbing line cracks, heating/cooling piping leaks, outside seepage and more before damage and downtime occur. The water detector alarm features vary by model.

DYNAMIC AIR QUALITY SOLUTIONS www.DynamicAQS.com

It is increasingly understood that indoor air quality (IAQ) impacts learning. Dynamic Air Quality Solutions manufactures high-efficiency air cleaning systems that improve IAQ, save energy and reduce operating costs. Dynamic Air Cleaners remove odors and VOCs in addition to ultrafine particles. The Dynamic V8® Air Cleaning System delivers MERV 15 performance and offers media change-out

intervals measured in YEARS instead of months. Dynamic Activated Carbon Matrix™ (ACM) Systems allow for precise control of gas phase contaminants without the energy penalty and high maintenance costs. Dynamic Sterile Sweep™ UVC Systems provide high output UVC for the inactivation of biological contaminants. Dynamic Air Quality Solutions is a proud partner of ASHRAE headquarters renewal project.

STERIFAB BY NOBLE PINE PRODUCTS COMPANY www.sterifab.com

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ULINE www.uline.com

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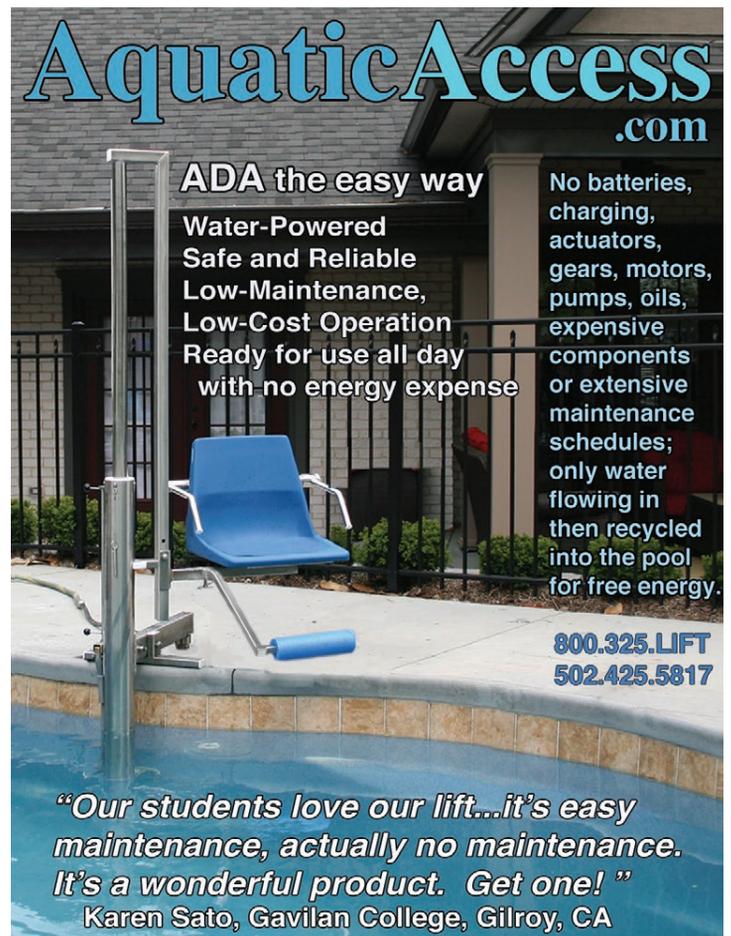
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Ulrich Pakker Studios design, market, fabricate and install metal sculpture and fountains, from tabletop to monumental, in corporate, private and government settings. Ulrich Pakker Studios has grown from a small company to a medium-sized firm with art installations all across the country. Ulrich Pakker, the primary designer, creates sculptures primarily out of stainless steel and bronze sheet metal. He designs and fabricates both table top and monumental size sculpture and fountains. His work has been chosen for the gateway sculpture of the city of West Palm Beach, Florida,

has appeared on the grounds of the Seattle Art Museum, is installed on the Microsoft Cedar Court Campus, at the University of Pennsylvania and across the country. Ulrich's work has also been featured in The Guild Sourcebook of Architectural and Interior Art. His sculptural works can currently be seen in numerous outdoor sculpture exhibitions and galleries from Boca Raton, Florida, to Seattle, Washington.

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prices and customer service that is second to none. This merger expanded our depth of resources and enhanced our capabilities, bringing additional custom-imprinted and stock looseleaf product offerings to college stores. We also added a full-time dedicated Marketing/Creative Director and two Graphic Artists to service our customer base of over 3,500.

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Aquatic Access offers a full line of water-powered lifts for in-ground pools and spas, above-ground pools and spas, portable spas, swim spas, and for most whirlpool, therapy, or rehabilitation tubs and pools, including those with six-foot walls. We also build lifts for boats, for docks, and for cruise ships to provide access to pools and spas.

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Formerly Institutional Products, Inc. of Indianapolis, IPI by Bison provides ceiling and wall mounted basketball backstops, gym divider curtains, batting and practice cages, gym floor covers, wall and stage padding, and a wide selection of gym and field sports equipment for sports-related new construction and renovation projects. For over 40 years, IPI has provided quality gym equipment to schools, recreation centers, churches, health clubs, pay-to-play facilities, YMCAs and virtually anywhere that indoor team sports are played. In 2012, IPI was acquired by Bison, Inc., arguably the industry leader in post-construction, indoor gymnasium and outdoor sports equipment; and IPI customers now can take advantage of

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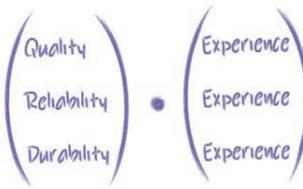
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