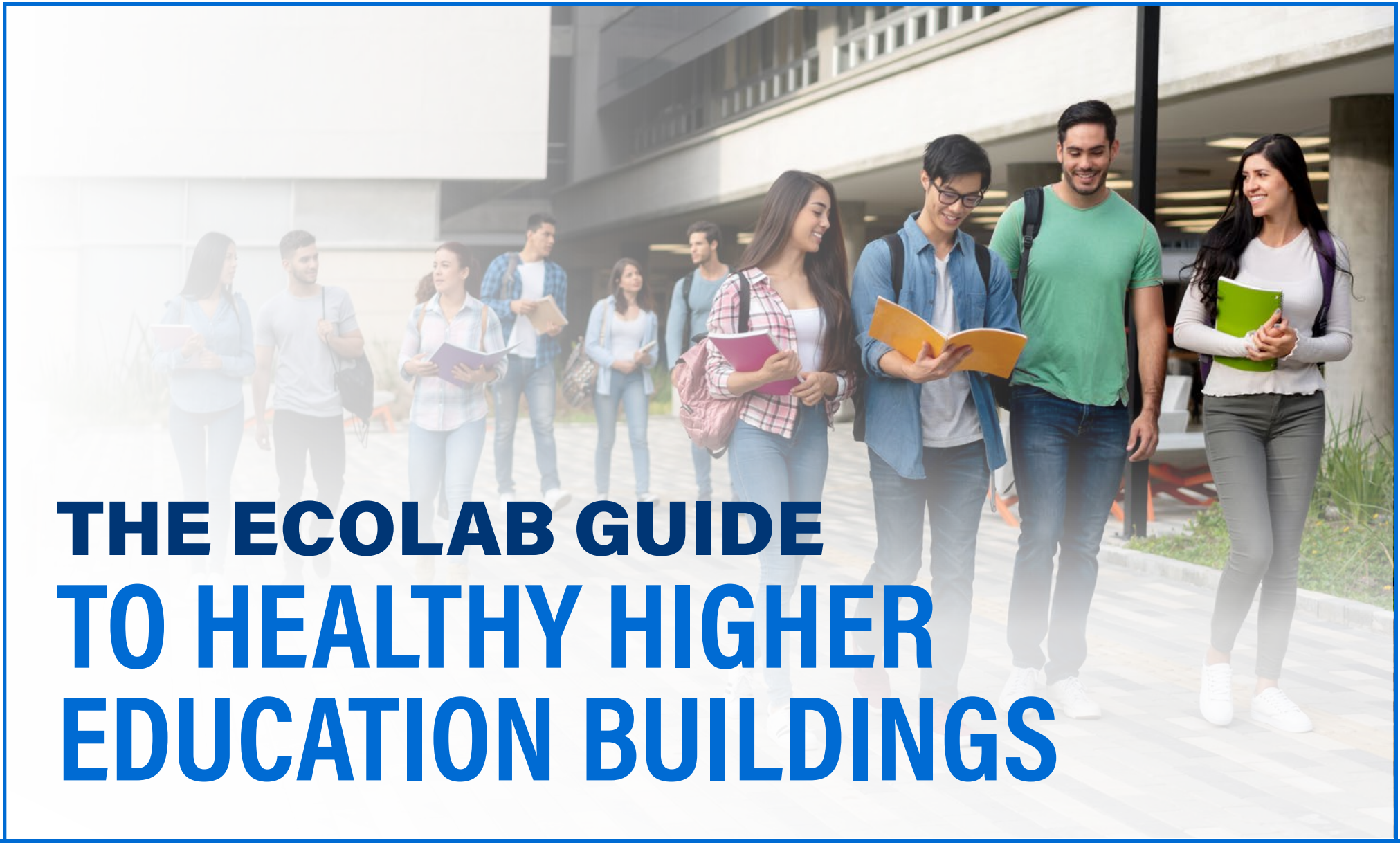

THE ECOLAB GUIDE TO HEALTHY HIGHER EDUCATION BUILDINGS

Driving Healthier Campus Environments for Students and Staff

ECOLAB®

Contents

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Executive Summary

The focus on healthy higher education campus buildings is a natural outgrowth of the sustainable, "green" building trend of the last two decades — accelerated by the COVID-19 pandemic. Creating healthier indoor environments aligns with the long-standing focus colleges and universities have on the health and well-being of students, faculty and staff. It also serves as a natural extension of these institutions' emphasis on sustainability. Despite increased awareness of how the built environment impacts the health of people and the planet, there remains some uncertainty around the definition of, and criteria for, a healthy building.

This guide is designed to give those with responsibility for student and employee safety, well-being and satisifaction, as well as those with responsibility for college and university enrollment, a go-to resource for understanding the healthy building paradigm, including:

IMPORTANCE OF HEALTHY CAMPUSES
Rising expectations and measurable value

DEFINING OF A HEALTHY BUILDING
The four core elements of a healthy campus building

PROTECTING YOUR REPUTATION
Creating tangible improvements that boost the student experience

BENEFITS OF CERTIFICATIONS AND PROGRAMS
Guiding investments, validating goals and earning student, faculty and staff trust

VERIFYING ONGOING PERFORMANCE
Leaning on expert partners to achieve the continued value of healthy campus buildings

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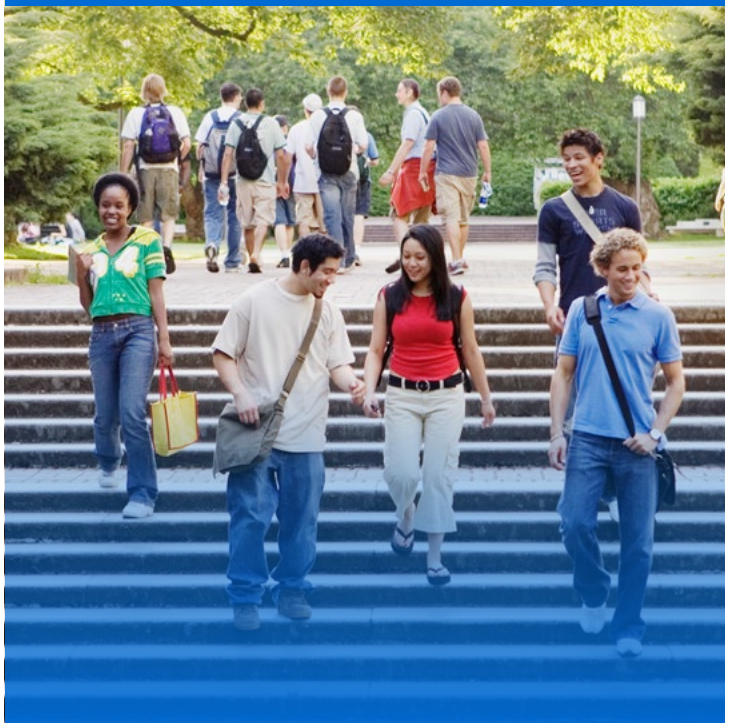
HEALTHY BUILDINGS: From Buzzword to Value Booster

The idea of the health-promoting university campus was introduced over two decades ago.[1] However, an emphasis on environmental impact tended to overshadow building impacts on human health. Colleges and universities took part in this "green" movement, fueled in part by generations of students who showed increasing concern for environmental stewardship.

More recently, student well-being has started to come more to the forefront and health and wellness efforts are underway on many higher education campuses. For example, more than 150 institutions have joined the U.S. Health Promoting Campuses Network.[2] Two-thirds have employee wellness programs.[3] And many more provide and advertise wellness resources for students. Likewise, some colleges and universities have started considering the connection between well-being and the environment, as what makes a building "green" can also make it "healthy."

The COVID-19 pandemic amplified our collective awareness of the health and safety issues of the places where we live, learn, work, shop and play. Experts believe this amplification is permanent. In the defining modern essay on healthy buildings, the Harvard Business Review declared, "In the post-COVID world, buildings will be seen as a first line of defense against disease. A healthy building will go from a 'nice to have' to a competitive 'must have.'"[4]



What is Well-Being on a College Campus?

While a singular definition of "well-being" is elusive, most agree that it includes promoting behaviors and environments that result in higher quality of life, improved health, and prevention of illness.[5] Dimensions of well-being might be physical, social, environmental, occupational, emotional, and intellectual, among others.[6]

1. http://ushpcn.org/network/
2. https://cupahr.org/blog/a-comprehensive-look-into-the-wellbeing-of-higher-ed-employees/
3. https://pubmed.ncbi.nlm.nih.gov/29328864/
4. https://hbr.org/2020/04/what-makes-an-office-building-healthy
5. https://www.tandfonline.com/doi/full/10.1080/15332840802269858
6. https://www.gensler.com/blog/an-8-step-model-for-esg-and-wellness-in-the-workplace

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HEALTHY BUILDINGS: Foundational to Success

"The vitality of our University depends on the health of our people."

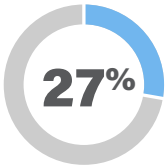
— Harvard University[1]

Top benefits of healthy campus buildings:

Better First Impression

4 in 10

Families say the **APPEARANCE AND CLEANLINESS** of a campus is a significant part of the selection process[2]



27% of students said they attended their school because they **LIKE THE CAMPUS, NOT THE PROGRAMS**[3]

Improved reputation for student well-being

9 in 10

Students **CONSIDER THEMSELVES HEALTHY,** but less than half think their college or university makes health and well-being a priority[4]

Colleges and universities that have **HIGH-PERFORMING BUILDINGS** see increases in course satisfaction scores[5]

Increased academic performance

9 in 10

Students believe a **LACK OF FACILITY CLEANLINESS** is a distraction to learning[6]

1. https://green.harvard.edu/campaign/our-plan
2. https://www.insidehighered.com/admissions/article/2022/03/21/survey-student-college-choices-both-practical-and-strategic
3. Western Kentucky University, Impact of Campus Facilities on Recruitment, 2019
4. https://www.acha.org/documents/ncha/NCHA-III_SPRING_2022_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf
5. https://files.eric.ed.gov/fulltext/EJ1152654.pdf
6. https://files.eric.ed.gov/fulltext/EJ938802.pdf

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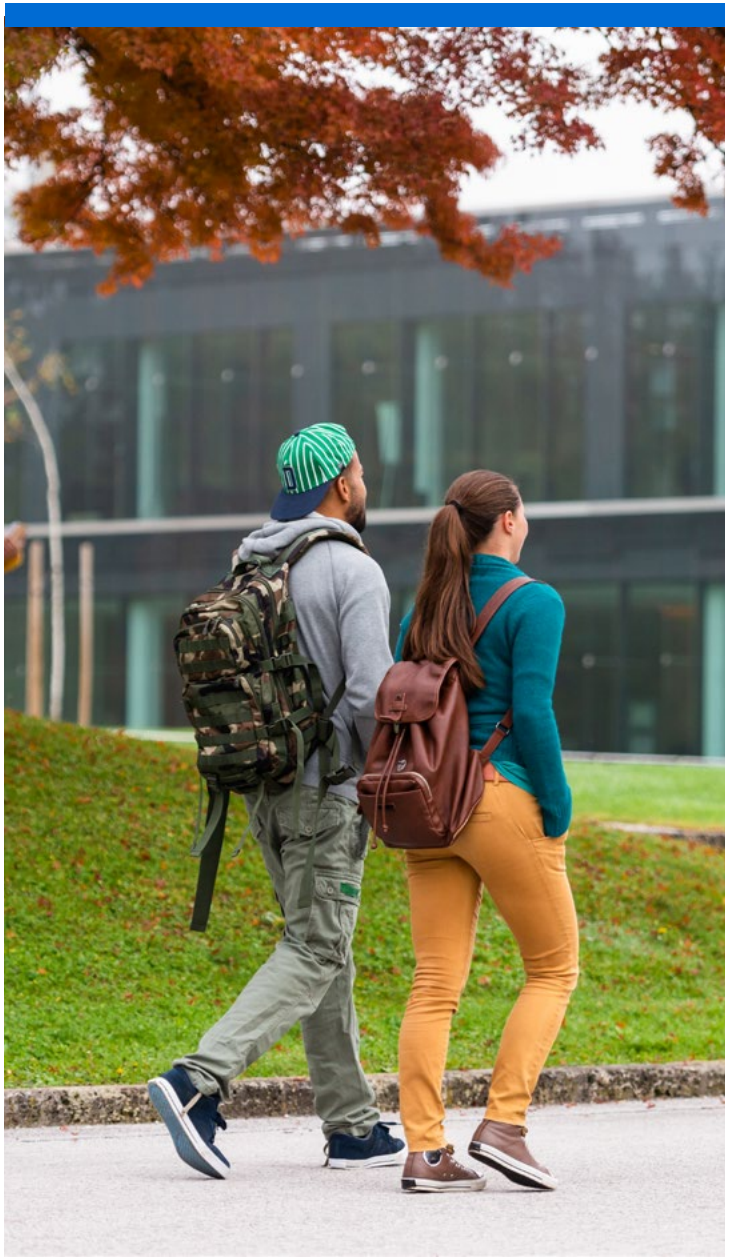
THE VALUE OF A HEALTHY CAMPUS: Driving Value across Multiple Fronts

Healthy higher education campuses can deliver many tangible benefits for colleges and universities.

Attracting Prospective Students

- With more than **4,000 colleges and universities** in the United States, the competition for attracting and retaining students is strong. It's important to appeal to both students and parents. A school's reputation and/or third-party ranking can play an important role. While rankings are largely derived from academic factors, the appearance and maintenance of campus can also have an impact on whether an institution is selected.
- Students value the condition of campuses, with **4 in 10 stating that the look and feel of their campus** was a top factor in enrolling at their institution.[1] That's roughly the same frequency as financial aid, cost, and academic quality. Meanwhile, **1 in 6 students rejected an institution** because of poorly maintained facilities.[2] The condition of campus is also important to parents. Nearly **50% of parents of prospective students rank cleanliness and indoor air quality (IAQ)** the top three factors in college selection, behind only academic quality.[3]
- The look and feel of campus can indirectly impact school rankings. For example, while U.S. News rankings don't explicitly include appearance, reputation is part of a peer survey, which is worth **20% of the rank.**[4] Other ranking systems, including Princeton review, focus on student perception and include factors such as appearance and safety.[5]



1. https://www.insidehighered.com/admissions/article/2022/03/21/survey-student-college-choices-both-practical-and-strategic
2. https://www1.appa.org/FacilitiesManager/article.cfm?ItemNumber=3183&parentid=2596
3. https://www.us.jll.com/en/newsroom/JLL-Higher-Education-Survey
4. https://www.usnews.com/education/best-colleges/articles/how-us-news-calculated-the-rankings
5. https://www.princetonreview.com/college-rankings/ranking-methodology

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THE VALUE OF A HEALTHY CAMPUS: Driving Value across Multiple Fronts

Enhancing Academic Performance

- Students who successfully balance different elements of health, including environmental, have better academic results.[1]
- A comprehensive review of more than 30 research studies on the impact of cleanliness in schools concluded that **"cleanliness can affect student health and performance,"** noting clear links between "clean" schools and academic performance of students.[2] The meta-study found that students maintained higher grades and better graduation rates in cleaner environments.
- Cleaner, healthier school environments aren't just about helping to prevent students from getting sick and missing days. "Clean" also helps improve their attitudes, perspectives, concentration, and motivation. In a 2008 study, nearly **9 in 10 students said that a lack of cleanliness is distracting** — and believed that a high level of cleanliness would create a better environment to foster their learning and academic achievement.[3]
- Classrooms that have been configured to improve indoor environmental quality (IEQ) — temperature, noise, lighting, and air quality — lead to **higher course satisfaction among students.**[4]

1. https://www.tandfonline.com/doi/full/10.1080/15332840802269858
2. www.osstf.on.ca/en-CA/publications/research-studies/school-environment
3. https://files.eric.ed.gov/fulltext/EJ938802.pdf
4. https://files.eric.ed.gov/fulltext/EJ1152654.pdf

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THE VALUE OF A HEALTHY CAMPUS: Driving Value across Multiple Fronts

Communicating the Importance of Student Wellness

- **8 in 10 students** believe that the cleanliness of campus facilities impacts their health.[1]
- Annually, **18% of students suffer a respiratory illness** that impacts performance.[2]
- Physical conditions, such as health troubles, have been shown to be the leading cause of absenteeism among university students.[3]
- In addition to impacting your school's reputation or ranking, a school's interior climate, appearance, and cleanliness can send a positive or negative message to students, teachers, and staff. Evidence suggests that **"environmental conditions that create a sense of 'well-being' and send a 'caring message'** contribute directly to positive attitudes and elevated performance as measured by fewer health complaints, improved student attendance, teacher retention, and higher test scores."[4]

1. https://files.eric.ed.gov/fulltext/EJ1152654.pdf
2. https://www.acha.org/documents/ncha/NCHA-III_SPRING_2022_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf
3. https://www.researchgate.net/publication/333843370_Causes_of_Absenteeism_among_University_Students
4. https://www.cleanindiajournal.com/healthy-school-environment/

DEFINING A HEALTHY CAMPUS BUILDING

Strategies and interventions that center on well-being can help create a campus environment that supports student and employee health, as well as connection, engagement, and happiness. The American College Health Association (ACHA) has identified health promotion that includes well-being at colleges and universities as a critical factor for nationwide health improvement. In a recent study, the ACHA found that while colleges and universities have not adopted a universally accepted definition of well-being, there is a consistent movement toward taking a more systemic, environmental approach to it, which underscores the importance of healthy campus buildings.

In many ways, defining a "healthy" campus building is more intuitive than defining a "green" one. Many people think of similar things — like air quality and clean surfaces — that help make an indoor space healthy and safe. The emerging challenge is aligning on a consistent definition and to protect public confidence in the validity of the term (avoiding the fate of marketing cliches like "natural"). A clear definition also helps institutions direct and focus their investments.

While specific recommendations may evolve, Ecolab believes there are four core elements of healthy campus buildings.

4 Core Elements of Healthy Buildings

HYGIENE
Clean, safe environments throughout campus

AIR QUALITY
Clean air for all building users to breathe

WATER QUALITY
Safe, sustainable water-use practices

EXPERIENCE
Comfort & confidence in clean, healthy, safe spaces

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BEST PRACTICES: Hygiene

GOAL: Promote clean, safe environments throughout campus

Key Considerations

- **Create & regularly audit a comprehensive cleaning, sanitizing and disinfecting program:** Help ensure you have a fully specified cleaning and disinfecting program that covers surfaces and spaces, aligned with evidence-based best practices across campus.
- **Focus on right products & right protocols:** Make sure cleaning protocols specify the correct product and exact protocol, including defining where sanitization vs. disinfection is required. Follow the exact specifications for use found on the product label.
- **Prioritize robust staff training:** Staff training — including onboarding for new staff and frequent reinforcement for existing employees — should be a defined part of your comprehensive cleaning program. Invest time and resources to help staff understand proper cleaning protocols, including using the correct products, following product label use instructions, following safety and ergonomic best practices, etc.
- **Simplify & promote hand hygiene:** Create a robust hand hygiene program that includes convenient hand sanitizing and handwashing stations, with clear signage to remind and instruct people on effective hand hygiene.
- **Elevate food safety:** Foodborne illness presents one of the most common health risks.[1] Help ensure food safety considerations and protocols are part of your cleaning program.
- **Include proactive pest management:** Pests can be a source of food safety and other risks, as well as irritants and allergens. Integrate a proactive pest management plan as part of your cleaning program. Take caution to avoid the use of hazardous pest management chemicals that could negatively impact other healthy building efforts.

1. https://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html

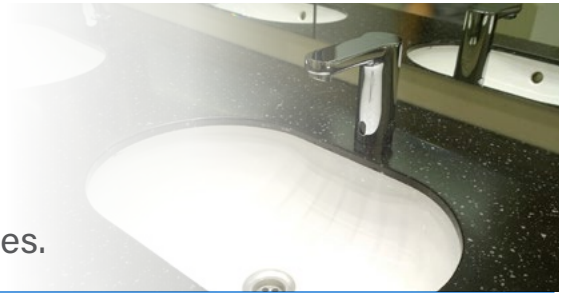
BEST PRACTICES: Air Quality

GOAL: Provide clean air for all building users to breathe.

Key Considerations

- **Air quality testing:** Regularly test indoor air quality to monitor levels of pathogens, allergens and other indoor air pollutants and particulates. Aim to achieve indoor air quality (IAQ) levels that meet or exceed industry standards.
- **Natural ventilation whenever possible:** Help ensure all campus buildings meet or exceed outdoor air ventilation rate guidelines such as those from The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to control indoor sources of odors, chemicals and carbon dioxide — and look to increase outdoor air ventilation and reduce recirculation of indoor air as much as the systems, climate and spaces allow.
- **Optimize air filtration:** Professional guidance, such as from ASHRAE, can help improve indoor air filtration, including installing mechanical filtration in your HVAC systems. Current ASHRAE guidance suggests using a MERV 13 or higher filter in order to achieve optimal filtration of incoming or recirculated air.[1]
- **Regularly clean ducts:** Frequently and thoroughly clean duct work to remove dust, organic and microbial build-up, and other debris — being careful to avoid releasing these pollutants further into the air intake system.
- **Conduct regular equipment inspections & maintenance:** Faulty equipment can create air quality issues. Schedule frequent inspection and preventative maintenance on your HVAC equipment across campus.[2]
- **Evaluate impact of materials:** Consider how building materials including flooring and walls, as well as furnishings and office supplies, may impact air quality.
- **Choose less volatile cleaning products & use properly:** Cleaning, sanitizing, and disinfection should not come at the expense of air quality. Seek out cleaning products and EPA-registered disinfectants that release fewer volatile compounds — and ensure they're used according to label instructions. Improper use — including mixing chemicals, incorrect concentration, or off-label use — can negatively impact indoor air quality and safety.

1. https://www.ashrae.org/news/ashraejournal/debunking-myths-about-merv-air-filtration
2. https://www.osha.gov/sites/default/files/publications/3430indoor-air-quality-sm.pdf



BEST PRACTICES:
Water Quality

GOAL: Develop and promote safe, sustainable water-use practices.

Key Considerations

- **Develop & implement a water management program:** Follow CDC guidance and all local regulations to develop an ASHRAE 188-based plan to mitigate water-borne public health and infection risks, including Legionella bacteria, for all identified at-risk water systems.
- **Implement a water treatment/water quality program:** Assess your water quality and overall system performance. Implement a specific water treatment program designed to extend asset life, reduce water, and reduce energy consumption.
- **Deploy water filtration & treatment for drinking water:** Help improve both water safety and taste by installing water purification systems for drinking water to remove contaminants if necessary. This may include water softening, filtration or chemical treatment.
- **Follow water re-use and recycling best practices:** Implement ongoing best practices for alternative water source uses and water recycling practices to optimize energy consumption and reduced water discharge/effluents. This may include mechanical, operational and/or water treatment solutions to support HVAC equipment.
- **Implement water efficiency strategies:** Implement high-efficiency/low water-use fixtures while managing overall utility water use (potable & non-potable water) to help achieve water waste-reduction goals.
- **Water-based fire suppression systems:** Follow evidence-based best practices for maintenance and inspection to help ensure proper working condition.
- **Install automated & touchless dispensers:** Installing touchless water and ice dispensers can help mitigate transmission of pathogens on surfaces, as well as reducing the risk of contaminating the dispenser itself.

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BEST PRACTICES: Experience

GOAL: Creating comfort & confidence in clean, well-maintained spaces across campus

Key Considerations

- **Maintain comfortable air:** Keep temperature and humidity levels consistent throughout the day, providing zonal or individual thermal control where possible.
- **Control noise:** Monitor noise levels, aiming to keep background noise levels below 35 decibels in instruction areas. Use noise mitigation technologies to help protect against outdoor noises and mitigate the impact of indoor noises, such as mechanical noise.[1]
- **Prioritize natural light:** Prioritize natural lighting and/or blue-enriched lighting wherever possible, without creating glare issues for students and employees. Research shows exposure to natural light can reduce eye strain and headaches and promote better sleep, all helping to promote productivity.[2]
- **Invest in active, ergonomic design:** Promote healthy activity with features like accessible staircases and recreation areas. Follow relevant OSHA guidelines to help create safe, healthy work environments for your employees, and provide ergonomic furnishings that promote healthy use patterns across campus.
- **Prioritize a safe indoor environment:** Help building occupants feel confident and deliver peace of mind. Meet all standards around fire safety and carbon monoxide monitoring. Ensure doors, stairwells, common areas, parking lots/ramps and other public spaces are well lit. Monitor building traffic — including access security, video monitoring — and maintain a comprehensive emergency action/response plan.
- **Don't overlook the impact of scent:** Scent is an important indicator of clean and a proven way to promote well-being in an indoor built environment.[3] Consider cleaning and disinfecting products that leave a pleasant scent. You should also have a reliable de-odorizing product in your program that can target and eliminate malodor. Finally, make sure pest management products are safe for indoor use and do not leave unpleasant odors.

1. https://www.who.int/docstore/peh/noise/Comnoise-1.pdf
2. https://www.prnewswire.com/news-releases/study-natural-light-is-the-best-medicine-for-the-office-300590905.html
   https://view.com/sites/default/files/documents/Daylight-in-the-Workplace.pdf
   https://www.sciencedirect.com/science/article/abs/pii/S2352721817300414
3. https://www.frontiersin.org/articles/10.3389/fpsyg.2020.598859/full

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PROTECTING YOUR Institutional Reputation

While academic performance is the top consideration for prospective families, the college environment is a major part of that decision, and is a source of pride and security for students and alumni. With so many intangible factors involved in an institution's reputation, operational excellence provides a visible, tangible way to demonstrate care for the well-being of students and staff.

Institutions of higher education should aim to create an environment that fosters health and well-being, so students can flourish and thrive.

Understanding and implementing healthy campus principles is important, as is communicating and verifying achievement and progress. This can be accomplished multiple ways depending on your institution's goals and resources. Examples of steps you can take are listed to the right.[1]

These ongoing steps form a process to protect your reputation:

- **Set clear targets and tangible goals:** Communicate publicly in an annual report or through department metrics.
- **Consider a third-party program:** Building certifications as well as state and national programs, offer a range of operational certifications that can help improve the efficiency and health of buildings.
- **Leverage suppliers and providers:** Many suppliers and contractors offer support to help ensure their equipment, materials, or consumables are being used in the best way and can help develop and guide programs.
- **Communicate success:** A visible seal can show your commitment to students, staff, and visitors, and help demonstrate everything you're doing to make a safer, healthier campus. Publicly reporting your progress can make it easier for rankings agencies to consider.
- **Verify ongoing performance:** Healthy campuses are living, evolving organisms. Achieving a healthy building on campus is much more of an ongoing exercise than achieving a green building. Ongoing assessments help your institution and your campus users can feel confident that you're continuing to meet goals and create healthy, safer environments.

1. Abrams, G. B., Andes, S., DeRicco, B., Rider-Milkovich, H., & Wilcox, D. (2019). CAS cross-functional framework for advancing health and well-being. P. J. Carretta (Ed.). Washington, D. C.: Council for the Advancement of Standards for Higher Education

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BUILDING CERTIFICATIONS AND PROGRAMS

A recent study in the Journal of Building and Environment found achieving and displaying building certifications are linked to improvements in occupant satisfaction, mental health, well-being, and productivity.[1]

There are many healthy building program standards available today, varying widely in their focus, scope, rigor, cost, and time to achieve. Programs can be found from certifiers, providers, or professional associations. **Generalist** options broadly define standards across the four elements of a healthy campus building, allow for a broad scope, and provides compelling proof to those on campus. They can be more time- and cost-intensive. **Specialist** options focus on a specific element (such as hygiene) with deep, specific guidance and rigorous assessment. While less holistic, they can address a specific target area of campus health.

While different standards can be applied to nearly every building, the right certifications or programs will depend on the specifics of your campus as well as your institutional values and goals.

Key Considerations

- **New construction or existing building?** Some standards are better suited for new construction, whereas others are designed to help enhance existing buildings. Many specialized certifications can be applied to both new and existing buildings.
- **What are your biggest building health challenges on campus?** Make an honest assessment of where your campus buildings are strongest and weakest, looking across the key pillars of Hygiene, Air Quality, Water Quality and Experience. If you see issues concentrated in certain areas, specialized certifications may provide more targeted impacts. You can do this internally or use a third party.
- **What do you want to communicate about your campus?** School rankings and even campus visits can't always answer questions about whether a campus is well-maintained, whether a college or university cares about a student's well-being, or whether a campus adopts sustainable practices.[2] Physical spaces can be used to signal your institutional priorities and the right certifications can help you do that.
- **What are your time and cost constraints?** Broader-scope certifications tend to require more time and cost to achieve. Depending on your time and budget goals, specialized certification(s) may provide more "bang for your buck" and allow you to achieve targeted impacts in a tighter timeline.

1. https://www.sciencedirect.com/science/article/pii/S0360132322007697
2. https://slate.com/human-interest/2022/10/us-news-rankings-how-to-pick-a-college.html

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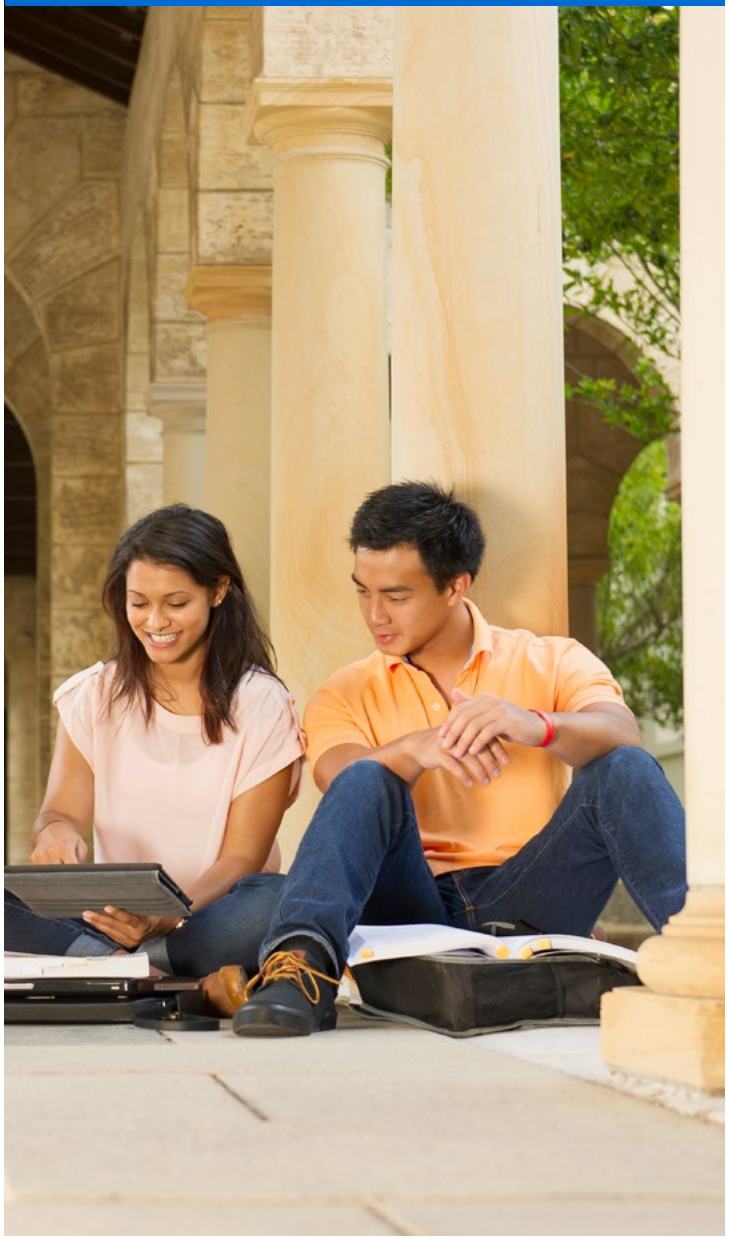
BUILDING CERTIFICATIONS & PROGRAMS: Validation and Communication

"You can manage what you measure" is a common adage among process improvement professionals, and a journey to make a healthy campus is no different. Once you've decided on targets and goals and begun to implement the four elements of a healthy campus, validation helps ensure that any gains are sustained.

In an annual national survey, only half of students responded that they believed their organization made their health and well-being a priority. Validating the steps you are taking to help improve hygiene, air quality, water quality, and experience are making gains towards a healthy campus allows you to communicate that wellness is a priority.

Reporting progress publicly can help integrate existing ESG and sustainability efforts with wellness programs, providing accountability and credibility to your efforts. Validation provides the hard data to support those claims and allows confident, meaningful communication on campus and in marketing to prospective students.



1. https://www.acha.org/documents/ncha/NCHA-III_SPRING_2022_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf

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BUILDING CERTIFICATIONS & PROGRAMS: Choosing Partners to Support You

Many institutions interested in pursuing healthier campus buildings partner with key vendors to support them with expertise, guidance and service along their journey. As you build a strategy toward achieving your healthy campus buildings, here is a quick list of what to look for in your vendor partners:

Comprehensive solutions

Your vendor should be able to provide expertise across several facets of your program, such as cleaning and disinfection, hand hygiene, pest management and food safety, so you don't have to try to manage multiple vendors.

Consultative guidance

Your vendor relationship should extend well beyond the transaction of products and services. Expert vendor partners should be able to provide guidance in helping you put the pieces, protocols and programs in place designed to achieve healthy campus buildings, including guidance that extends beyond the products they provide.

Science-based approach

As you invest in creating a healthy campus, you want to know your partner is leading you based on proven guidance. Their services and practices should be evidence-based and science-backed wherever possible, to help deliver the outcomes you expect. For example, a science-based approach to hygiene validation is important: are the right products for each job being used? Are process and procedures being followed? Are the right resources readily available? Validation programs can help to further emphasize this focus and drive compliance.

CONVENTIONAL VALIDATION	SCIENCE-BASED VALIDATION
Is disinfection being done?	**Are disinfection protocols in place to effectively remove pathogens from surfaces?**
Are food contact surfaces sanitized?	**Is a food-contact-safe sanitizer being used correctly based on the product label?**
Is hand soap refilled?	**Are handwashing/hand hygiene products and protocols in place to drive compliance?**

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BUILDING CERTIFICATIONS & PROGRAMS: Verifying Ongoing Program Performance

Whether it's a broad-scope or specialized solution, healthy building certifications and programs can help ensure you're investing in the right areas and provide confidence to those on campus. Like the health of an individual, the health of the buildings on your campus is incredibly dynamic. Most of the factors impacting the health of a building can and do change year to year, day to day and even hour by hour.

Ongoing verification helps assure that you are achieving your goals, and allows you to both track improvements over time and make adjustments as necessary. The much broader range of benefits — from making a better first impression with prospective students and their parents to improving both the health and performance of existing students and employees — depend on proper validation of measurements and ongoing review and verification of the goals you've set for your campus buildings.

For more information about how Ecolab can help you achieve healthy buildings, visit:
ecolab.com/healthy-buildings