

Creating a Culture of Sustainability

How Campuses Are Taking the Lead



Second Nature, an organization that developed the Education for Sustainability program, asks, "What if higher education was to take a leadership role, as it did in the space race and the war on cancer, in preparing students and providing the information and knowledge to achieve a just and sustainable society? Imagine the societal impact that higher education could have if, as a sector, it incorporated sustainability principles and practices into fundamental decisions about purchasing, building design, and operations. Imagine the impact of higher education forming partnerships with local and regional communities to help make them socially vibrant, economically secure, and environmentally sustainable. And imagine the long-term leverage if higher education faculty and students, working in conjunction with administrators and staff, conducted the research for and helped to implement sustainability programs on campus and surrounding communities. Graduating students could then bring the knowledge, skills, and values of sustainability to their future employment, consumption decisions, lifestyle choices, and to the improvement of the communities in which they live."¹

Big ideas? Yes. Big dreams? Not necessarily.

Colleges and universities throughout the U.S. are making these ideas reality. Sustainability initiatives are influencing curriculum decisions, operations budgets, facility plans, and campus culture. Students, faculty, and staff are leading the efforts. They often find it to be difficult work, requiring the kind of campus-wide coordination and cooperation that's often absent from the organizational structure of higher education institutions. Yet while the approaches and participants vary, all share a common motivation—to do the right thing.

Defining sustainability: Beyond green

"Sustainability," says Michael Crow, president of Arizona State University, "is at the intersection of environmental, economic, and societal stewardship."² Sustainability focuses on balancing these three areas. A high-performance building, for example, offers savings and efficiencies in maintenance; it decreases its impact on natural resources; and it creates an environment that is productive, creative, and innovative. Economy, society, and environment come together. In the same way, courses and programs that explore sustainability should make students think about the financial, societal, and environmental impact of a decision or a project.

As this definition makes clear, sustainability is larger than green issues alone. David Orr, director of Oberlin College's Environmental Studies suggests, "It is nothing less than the recalibration of human intentions with the way the world works as a physical system."³

Exploring sustainability within the higher education arena is important, given the impact colleges and universities make on the economy, environment, and community. Peggy Bartlett and Geoffrey Chase in the introduction to their book *Sustainability on Campus: Stories and Strategies for Change* outline several reasons why sustainability efforts within a higher education context can generate powerful results.

- Higher education has the potential to be a critical leverage point for change.
- Colleges and universities in the U.S. teach approximately 14.5 million students each year, and these future citizens and leaders will play a critical role in helping move to a more sustainable future.⁴
- Colleges and universities are inextricably woven into the communities in which they exist. They make a significant difference off campus as well as on.
- Campuses across the United States alone represent an enormous investment in buildings and land. Their actions are important to the environmental health of the broader society. (In fact, the operation expenses of U.S. colleges and universities total about \$185 billion per year, more than the GDP of all but 20 countries.)⁵

The impact of sustainability

Colleges and universities around the country are learning that sustainability efforts have a measurable—and positive—impact.

Environmental stewardship can be a visible symbol of the values and cultures of a college. Johns Hopkins University, a premier health institution in Maryland with schools of medicine, public health, and nursing, sees sustainability efforts as core to its mission. "Linking sustainability and ecological responsibility to human health is an essential concept for the preservation of humankind and can serve as an important stimulus for progress," write Polly Walker and Robert Lawrence in their analysis of the attitude toward sustainability at the university. Environmental stewardship is a health issue, and Johns Hopkins visibly demonstrates this fact in its curriculum design, which introduces issues of sustainability to all undergraduate and public

health students.⁶

Berea College, a liberal arts school in Kentucky, approaches the agriculture and economic development of the Appalachian community from a tradition of faith and mission. Its Subcommittee on Sustainability, in helping to draft the college's strategic planning goals, established that "coming to understand the workings of our natural environment and the consequences of human interventions" is an expected outcome of a culture that seeks to develop spiritual and agricultural connections.⁷

Environmental stewardship can demonstrate leadership through example. Daniel Beaudoin is operations energy and utilities manager of Harvard University's School of Public Health, which includes the Landmark Center, listed on the National Register of Historic Buildings and Harvard's first LEED-CI (Leadership Education for Environmental Design, Commercial Interiors) project. The building gives the school an opportunity to visibly live out its mission. "The way I look at it," says Beaudoin, "we are the School of Public Health and, of all the branches of the university, we should be the ones to be the pioneers of these new technologies that improve indoor air quality, decrease energy usage, and help employees."⁸ What Beaudoin and his team have learned and will continue to learn about high-performance facilities will be passed along to the larger university community, which continues to grow through construction and renovation.

Cost savings or avoidance is a very real result of environmental initiatives. Operational efficiency can save money. A \$100,000 investment for a sustainable design feature on a \$5 million building will save approximately \$1 million in energy costs over 20 years.⁹ The National Wildlife Federation's Green Investment, Green Return report measures annual revenues and savings realized through sustainability efforts. It measured the efforts of 15 institutions and found their combined environmental efforts yielded \$17 million in savings.¹⁰ Multiplying the cost savings of these 15 schools by the 3,700 higher-education institutions in the U.S. yields a potential savings of \$2.6 billion.¹¹

A culture of sustainability and environmental sensitivity can attract students, faculty, and donors and enhance a school's reputation. Northern Arizona University recently established a Campus Sustainability Strategy Plan, which will introduce sustainability into

nearly every facet of the university, from transportation to curriculum. “This plan will not only help NAU save resources and money, it will also attract students, faculty, and donors already committed to the greening of campuses,” says Dr. Gary Nabhan, director of the Center for Sustainable Environments.¹²

From a first meeting of students thinking about the environmental impact of their campus to the construction of an innovative high-performance building, colleges and universities are taking steps to build the cultures and promote the actions of sustainability. A current review of the Council of Environmental Deans and Directors, facilitated by the National Council for Science and the Environment, lists over 100 institutions with academic programs—and identified leadership—that support sustainability initiatives.¹³

Where did these institutions begin their work? What keeps them going? How do they sustain their efforts?

From students to staff: Involving the campus community

“Right now the compass of the United States points the entire world toward a nonsustainable future. But the United States could be leading the way to creating a sustainable world. Furthermore, U.S. universities, as centers of innovation and learning, could be in the forefront, leading the charge.”¹⁴

That realization led Christopher Uhl to begin his journey at Penn State University. And while Uhl was the instigator, it was students who did the real work of turning ideas into projects and then into policies. At an informal meeting, Uhl asked students to think about Penn State as an ecosystem. They began at an unlikely place: looking at what Penn State used—and threw away. From fields of water reservoirs to landfills and dumpsters, students saw consumption. From these observations, they drafted a set of sustainability indicators. They measured far more than numbers such as energy use and waste; they also measured the ethics and culture of a sustainable institution.¹⁵ The act of measuring sustainability, says Uhl, legitimized it. The group’s next job, crafting a mission statement, codified it.¹⁶ After hours of writing, revising, and networking, a mission statement emerged that Penn State’s president signed four years after Uhl’s students visited the dumpsters.

The work hasn’t stopped. Students are now analyzing the Mueller

Lab, Penn State’s biology building. Uhl’s assignment: cut the ecological impact of Mueller in half while creating healthier working conditions.¹⁷ These are the types of projects and thinking that will stay with students well past their years at Penn State. Making sustainability real, making it connect to everyday actions, is the key for Uhl.

At Stanford University, five students who shared a mutual goal for the university to establish a green building policy formed Students for a Sustainable Stanford (SSS). What they learned along the way was that vision and commitment will take you far, but student-led initiatives need more. They need business acumen, professional appearance, political savvy, and the sense to know when to compromise or dig in your heels.¹⁸ Access to senior administration can be hard for students, so SSS members made sure they were prepared. “Not only did we have to speak business, we had to act it too,” they noted.¹⁹

They knew that presenting the business case for sustainability policies would get the ear of the administration. They centered on three arguments: Green buildings would save Stanford money, increase the productivity of the students, faculty, and staff working in them, and promote Stanford’s forward-thinking reputation among other higher-education institutions.²⁰

Six months after the SSS formed, another group composed of Land and Buildings staff, faculty, and students took shape, though the staff outnumbered faculty and student representation. Fearing that the hard work and progress they had made would be forgotten, SSS members argued for the new group’s continued commitment to crafting building guidelines. Over the next few months, the group moved toward its goal of creating green building guidelines and ratings. The work of implementing Stanford’s Sustainability Guidelines is the next step, but a road map now exists.

Audrey Chang, a charter member of SSS who was instrumental in drafting the Guidelines, learned that the diversity created when administration joined the effort was important. “Diverse representation allows greater creativity and ambition in tackling a problem as tough as this one.”²¹

That observation played out in very real ways at Illinois Wesleyan University, a private liberal arts college. A course taught by Environmental

Studies faculty that assessed the environmental impact of campus operations resulted in the formation of the Green Task Force (GTF). The GTF enlisted a larger representation of students and administration, particularly the physical plant staff. Abigail Jahiel and Given Harper, directors of the Environmental Studies (ES) program, wanted the GTF to be comprehensive and represent a true cross section of the campus.²² The combined work challenged the perception that knowledge was reserved for faculty and students only, and that staff was there to follow directions. At first students didn't see the value of the physical plant staff's contributions, though they were the people who continued keeping the efforts alive on a daily basis. Students and faculty came and went, but the staff remained active, note Jahiel and Harper.²³

Even Jahiel and Harper didn't realize the depth of environmental knowledge the physical plant staff possessed. A visit by the physical plant's director to Jahiel's "Green the Campus" course provided some surprises. The director began by telling about the energy management plan he began in 1984—15 years before the task force was even an idea. Over the years, he battled the administration and continued his efforts. Wrapping up his talk, the director angrily listed his credentials; he was an expert in this area, but no one had tapped or acknowledged his expertise and experience in the work of the GTF.²⁴

The authors reflect on what they learned that day: "It forced us to recognize staff members' vast expertise and showed the importance of checking one's own assumptions. It also illustrated the complexity of trying to green our campus. And it drove home how critical it would be to cultivate relationships of mutual respect among the various populations on campus."²⁵ In the end, the physical director and the ES directors became allies. And the concern that staff members had for the quality and culture of the place they worked, and their willingness to dig in and get the work done, became apparent to all.

Integrating sustainability into the curriculum

Formal education is a critical step in building a sustainable society. No longer independent courses with peripheral relationships to biology or geology, sustainability has emerged as its own discipline, with many schools now offering minor and major concentrations. The common thread seems to be an interdisciplinary approach and an understanding that sustainability is woven into all disciplines, from chemistry to

economics.

St. Olaf College, a liberal arts college in Minnesota, cites "expand the teaching of environmental literacy" as one of the performance measures for its sustainability efforts. To that end, the school offers an Environmental Studies (ES) major and minor concentration and a host of class offerings for non-ES majors. It also integrates environmental teaching into non-ES courses. For example, green chemistry experiments and lectures are now part of the general 200-level organic chemistry curriculum.²⁶

This is an illustration of "hidden curriculum," Peggy Bartlett's term for integrating sustainability content into course strategies. At Emory University, where Bartlett teaches, there are many examples of this hidden curriculum. A literature course studies eco-criticism; a student project tackles the issues of golf course maintenance and environmental damage; a Chinese language class produces a newsletter (in Chinese) that covers environmental issues. The first steps toward building sustainability into a curriculum can be small ones.

The Piedmont Project, Emory's greening of the curriculum, found success in engaging faculty by connecting their areas of specialization with issues of sustainability. "From the security of their own specialization," says Bartlett, "faculty could move into areas not as familiar or comfortable."²⁷ One of the benefits of integrating sustainability into the disciplines is the opportunity it offers for faculty and students to learn together.

"Sustainability is a worldview," says Debra Rowe of Oakland Community College in Michigan. She notes that this is why it is important to infuse it throughout the disciplines, the general education curricula, and the student's whole educational experience.²⁸

An interesting result of a revised curriculum is often a revised teaching style. Faculty who have integrated sustainability curriculum into their classes have moved away from lecture approaches to discussion formats that engage students in critical thinking and evaluation—essential skills for weighing opinions and ideas and finding their voices in a sustainable society.²⁹

Ball State University, in Indiana, works to create innovative approaches to environmental literacy. Its latest effort is a minor in Environmental Context for Business. Citing the efforts of international

organizations that unite environmental initiatives and business endeavors, the program overview states the need to educate students on the codependence of the business world and the natural world.³⁰ The requirements of the minor illustrate the interdisciplinary nature of sustainability curriculum, combining philosophy, biology, technology, and politics.

Lewis & Clark College, in Oregon, offers an Environmental Studies undergraduate major that supports nine different concentrations: chemistry, communication, conservation biology, history and literature, international affairs, philosophy, political science, and sociology. Many graduates of the program go on to specialized study in graduate or professional programs in environmental science, policy, education, or law. Others find post-graduate employment with federal, state, and local government agencies; environmental foundations; “green” businesses; sustainable agriculture concerns; and consulting firms.³¹

Aquinas College, a private liberal arts college in Michigan, has offered a Sustainable Business major since 2003. In 2002, the college’s provost commented that the school had strong business, science, and environmental studies programs. If the college could combine the individual strengths of these programs, he wondered, what would the combined offering look like? He gave the assignment to Dr. Matt Tueth, then a professor in the environmental studies program. He partnered with local business leaders to talk about possibilities. These leaders validated Tueth’s ideas: They spoke of their needs for the kinds of skills a sustainable business major would develop.³²

The interdisciplinary nature of the emerging major was particularly important to Tueth. “I’ve never liked the compartmentalized nature of higher education, with few opportunities to explore the interdependencies of disciplines.” Based on his intuition and the conversations with business people, Tueth felt this was the direction higher education would take. Within one year, he had defined a new major. And the connection with the business world continues. An advisory board of 12 people—10 from business and two from academia—continues to work with Aquinas and Tueth on evaluating and refining the program. “They represent, after all, the potential employers of our graduates,” says Tueth. “I ask them to help us produce the graduates they are interested in hiring.”³³

The Ponderosa Project of Northern Arizona University is an example

of how educating faculty in issues of sustainability can build a rich and diverse curriculum. Since 1995, environmental sustainability has been integrated into over 120 courses across the NAU curriculum. This is possible because over 100 faculty members have taken part in the Ponderosa Project, a faculty development program that provides a forum for faculty to “explore the necessity for interdisciplinary approaches to research and teaching about sustainability.”³⁴ The Project also provides visibility and a voice for a continued university-wide commitment to sustainability.

The Ponderosa Project was one of the first programs to push sustainability beyond one or two disciplines or courses. As Paul Rowland, cofounder of the Ponderosa Project and former director of NAU’s environmental education says, “You don’t have to take a traditional environmental science course to find out about the environment.”³⁵ Since its beginnings, the philosophy of the Ponderosa Project has remained consistent. Each year, when planning the faculty workshop, these principles drive the agenda.

- Faculty benefits most from being presented with a broad range of approaches and ideas.
- Education for sustainability is linked to content and pedagogy—how we teach is as important as what we teach.
- Faculty members know best how to revise the courses they teach.
- One way to help faculty members is to provide opportunities for them to step outside the boundaries of their disciplines and departments, talk to each other, share ideas, and see themselves as essential participants in a larger project.³⁶

Specific studies such as architecture, design, engineering, and construction can provide critical education for future practitioners of these disciplines. While some engineering and architecture schools have done a good job of integrating green education into their curricula, too often they emphasize specialization and discourage integration. Jason McLennan and Peter Rumsey writing in *Environmental Design + Construction* magazine observe that there is too little collaboration among engineers, architects, and designers.³⁷ But they feel the tide is turning, in large part because the market is demanding new skills. A growing list of nationally leading firms now insist on green architecture knowledge as a prerequisite for hiring, an indicator that sustainability is finally entering the mainstream. “Many students are finding that

LEED accreditation on their resumes is just as important as knowledge of AutoCAD.”³⁸

The School of Architecture at Carnegie Mellon visibly demonstrates its commitment in this statement on its website: “Environmental sustainability as an education and organizational force informs all that we do.”³⁹ The school’s integrated curriculum brings together architecture, engineering, and public policy.

Colorado State University’s Institute for the Built Environment integrates construction and design. Students work together on real-life projects. One example is the Guggenheim Project, in which students renovated classrooms in Guggenheim Hall, an early twentieth century building. The U.S. Green Buildings Council selected the project as a LEED-CI pilot, which required following LEED standards on energy consumption and materials.⁴⁰ Students were involved in all aspects of green building design, even learning to negotiate with CSU’s purchasing group on buying from green vendors not previously approved by the group.⁴¹

Visible symbols of a commitment to sustainability

Sustainability can influence other areas of a campus, beyond facilities, and provide tangible examples of a college’s commitment to ecological stewardship. “Thousands of colleges and university buildings, existing and planned, are both part of the problem and potentially a great opportunity to do something better,” says David Orr, professor and chair of the Environmental Studies Program at Oberlin College in Ohio.⁴²

In many cases, construction projects can also become part of the hidden curriculum. When David Orr was charged with constructing a center for Oberlin’s growing Environmental Studies program, he saw students’ inclusion in the planning as an important educational opportunity. “It was designed to be a building that would teach,” says Orr.⁴³ The project also could demonstrate how a building can address the multiple elements of sustainability, such as landscape design, materials, energy and water use, and also societal and economic impact. The goal, says Orr, “was to better equip our students to solve twenty-first century problems.”⁴⁴

The result of engaging many minds and pushing the boundaries is Oberlin’s Adams Joseph Lewis Center. Architect William McDonough says it “represents a fundamental shift that goes beyond sustainability.”⁴⁵ Simply put, it gives back more than it takes. The Lewis Center is a power plant and sewage treatment facility; it

produces its own oxygen, gathers and stores solar energy, distills water, produces no waste (in fact, The Living Machine operation of the Center processes wastewater using only plants and animals; the distilled water exceeds federal standards),⁴⁶ adjusts to seasonal shifts in temperature and light, and is surrounded by a biologically diverse, food-producing landscape—“a complex machine,” says Orr.⁴⁷

The groundbreaking facility has gained attention and earned recognition. In 2002, the U.S. Department of Energy named it one of 30 Milestone Buildings of the Twentieth Century. It also demonstrates Oberlin’s commitment to sustainability. Its operations are cost effective (Oberlin sells excess energy produced by the Center back to the State of Ohio). And it offers students a real example of what they can do to reverse the trends of consumption, “stretching,” says Orr, “the ecological imagination and competence of Oberlin college students.”⁴⁸

While the results of the Lewis Center are extraordinary, any university can make strides in environmental stewardship by committing to improve the efficiency and impact of its facilities. The opportunity for positive change is significant. Consider that nearly 40 percent of the U.S.’s total raw materials and energy use come from the construction and maintenance of buildings⁴⁹ and that the education sector accounts for nearly nine percent of the U.S.’s gross domestic product, second only to healthcare. What colleges do and how they act with this enormous share of the U.S. economy will impact the ecological future of the country.

They are responding to the opportunity. The U.S. Green Building Council’s LEED program cites higher-education buildings second only to commercial offices in the number of LEED-rated projects.⁵⁰

Emory University’s Whitehead Biomedical Research Building, completed in 2001, received LEED certification, the first building in the Southeast to receive such a rating.⁵¹ Its Board of Trustees has endorsed LEED as a guiding principle for all construction and renovation projects. Emory follows these principles not only because it is the right thing to do, but also because it makes financial sense for the university. Robert Hascall of Emory’s facility management group knows that any initial costs for following green construction methods will be recovered through lower operating costs over time. “There’s also evidence that green buildings increase employee productivity, reduce rates of sick leave, increase the rate at which students learn, and improve employee morale.”⁵²

Lewis & Clark College in Portland, Oregon, also adheres to LEED guidelines. Its campus is impressive in its examples of sustainable buildings. Roberts Residence Hall, completed in 2003, received a Silver LEED rating. The project involved students in the programming and design of the facility. Lewis & Clark's latest effort, J.R. Howard Hall, was built to Gold LEED standards. It will consume 40 percent less energy than a typical building of its size, helping reduce the school's ongoing operating costs. As in the case of Roberts Hall, students took part in the Howard Hall project. Geology, environmental studies, and economics classes provided research and analysis of the facility's environmental features.⁵³

The college's values enrich Portland, an environmentally minded community. "Lewis & Clark's commitment to sustainability is not just talk; we model our sustainable efforts to the community at large. We are proud to put our 'green' face forward," says president Tom Hochstettler.⁵⁴

Looking forward is the approach that St. Louis Community College is taking. The college's Board of Trustees has drafted a master plan that addresses sustainability activities and requirements for all four of its campuses. Issues such as site sustainability, water efficiency, energy and atmosphere, materials and resources, and indoor air quality must all be addressed in any facility project on any campus.⁵⁵ A master plan ensures that a road map is available for anyone involved in a future project. Such long-range planning also keeps the college focused in its work as stewards of the environment.

Tony Cortese, founder and president of Second Nature, speaks to the importance of a college's facilities in completing a culture of sustainability. "If the students are learning in class about the environment and how to act responsibly, and the university through its buildings, its operation and investments is unsustainable, they're sending a subtle but effective message that says 'do what I say but not what I do.' Practicing what they preach is extremely important."⁵⁶

Reaching out beyond the campus

The impact the construction industry has on sustainability is significant, says Brian Dunbar, director of the Institute for the Built Environment at Colorado State University. So he finds it natural to extend IBE's influence and knowledge to those practicing in the

construction trades.⁵⁷ IBE offers a 12-week course one night a week for construction managers, landscape architects, engineers, interior designers, and project managers to learn about green building issues. At the end of the 12 weeks, participants are prepared to test for LEED accreditation.

Dunbar sees great potential in this course. The "town-gown" relationship is important in building a reputation for its programs, its students' talents, and expanding the culture of sustainability. "Participants are making contacts, and they collaborate after the course in their 'real-life' projects. The partnering and networking is critical. These folks learn about potential projects from each other, which is good for business. But they also learn to approach projects differently, with new considerations for sustainable processes and materials." And the institute's internship program benefits as well, with a growing number of placement opportunities among local construction businesses.⁵⁸

"Our students are sought after," says Dunbar. "The industry is coming to us all the time." Large construction companies have realized sustainability is a growing issue, fed by the environmental awareness and requirements of the healthcare, education, and government sectors. "LEED-accredited professionals are expected these days."⁵⁹

Others are learning of the expertise of the CSU and IBE staff, and they're asking university representatives to speak at construction-industry conferences. They also participate in the U.S. Green Building Council and construction-related associations.

Sustainability efforts on college campuses can also have an impact on commerce outside the campus. Any new buildings or reconstruction projects on Middlebury College's campus in Vermont must meet LEED criteria as well as Middlebury's own sustainable design standards. The construction of a new science center in the early 1990s "jump-started a new sustainable wood industry in Vermont," states Nan Jenks-Jay, Environmental Affairs director at the college,⁶⁰ due to the school's requirement for wood materials from sustainably managed forests. Middlebury College learned that its efforts on campus can "influence professionals, from local carpenters to international architects, about the importance of local economies and environmental quality as it also leverages large-scale change in the region."⁶¹



Small steps and big ideas: The influence of higher education

Colleges and universities throughout the U.S. are working diligently to build sustainable cultures. Sometimes it is a first meeting of concerned students, staff, or faculty voicing their thoughts and concerns. Sometimes it is a sanctioned and funded program incorporated into the campus's day-to-day operations. It may be one project in one course or an identified major concentration. It can be placing recycling stations throughout a campus or constructing an environmentally advanced facility.

Leith Sharp directs the active and successful Green Campus Initiative at Harvard University, a program of national renown that serves as a benchmark for universities worldwide. Yet when asked what is most rewarding in her work, she answers, "When I see more and more people come to make new meaning of the university, the world, and their own role in charting a course forward for humanity as we grapple with this incredible challenge of environmental sustainability—that is the greatest pleasure in my work."⁶²

Notes

- 1 Second Nature, "Education for Sustainability, Part Two: Higher Education's Role in the Transition to a Just and Sustainable Future," available at http://www.secondnature.org/efs/efs_part_two.html (Accessed November 3, 2004).
- 2 Arizona State University, "ASU establishes International Institute for Sustainability to Address Regional and Global Environmental Threats," Press Release, Arizona State University, available at www.asu.edu/feature/wrigley.html (Accessed February 14, 2005).
- 3 David Orr, "Can Educational Institutions Learn?" in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), p. 174.
- 4 Peggy F. Bartlett and Geoffrey W. Chase, *Sustainability on Campus: Stories and Strategies for Change* (Cambridge: MIT Press, 2004), p. 5.
- 5 Jennifer Bogo, "Sustainability 101: Using the Community as a Classroom, Colleges are Rewriting the Standards for Environmental Education," available at <http://www.emagazine.com/view/?847> (Accessed April 6, 2005), p. 3.
- 6 Polly Walker and Robert S. Lawrence, "Challenges of Greening a Decentralized Campus," in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), p. 270.
- 7 Education for Sustainability Profiles, "Strategic Planning Subcommittee on Sustainability, Berea College, available at http://www.secondnature.org/efs/profiles/profile_berea.html (Accessed November 3, 2004).
- 8 Harvard Public Health NOW, "The Greening of Landmark Center by HSPH Underway," March 30, 2001, available at <http://www.hsph.harvard.edu/now/mar30/landmark.html> (Accessed December 15, 2004).
- 9 Greg Kats, Leon Alevantis, Adam Berman, Evan Mills, and Jeff Perlman, "The Costs and Financial Benefits of Green Building: A Report to California's Sustainable Building Task Force, October 2003, available at <http://www.ciwm.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf> (Accessed May 10, 2005).
- 10 Aaron S. Allen, "Institutional Change and Leadership in Greening the Campus," in *Sustainability and University Life*, Walter Leal Filho, ed. (Frankfurt: Peter Lang Scientific Publishers, 1999)
- 11 Bogo, p. 3.
- 12 Center for Sustainable Environments at Northern Arizona University, "Northern Arizona University Environmental Sustainability Plan," available at <http://environment.nau.edu/SustainabilityPlan/index.htm> (Accessed February 24, 2005).
- 13 Council of Environmental Deans and Directors, available at <http://www.ncseonline.org> (Accessed December 15, 2004).
- 14 Christopher Uhl, "Process and Practice," in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), p. 30.
- 15 *Ibid.*, p. 34-35.
- 16 *Ibid.*, p. 38-39.
- 17 *Ibid.*, p. 42.
- 18 Audrey B. Chang, "Developing Guidelines for Sustainable Buildings," in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), p. 181-183.
- 19 *Ibid.*, p. 181.
- 20 *Ibid.*, p. 181.
- 21 *Ibid.*, p. 189.
- 22 Abigail R. Jahiel and R. Given Harper, "The Green Task Force: Facing the Challenges to Environmental Stewardship at a Small Liberal Arts College," in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), p. 52.
- 23 *Ibid.*, p. 56.
- 24 *Ibid.*, p. 57.
- 25 *Ibid.*, p. 57-58.
- 26 St. Olaf College, "Sustainability Task Force Report," available at <http://www.stolaf.edu/green/report> (Accessed April 6, 2005).
- 27 Peggy Bartlett, "Sustainability in the Curriculum: Theory to Practice," Society for College and University Planning, Web conference, April 19, 2005 (More information available at <http://www.scup.org/profdev/notravel/curr.html>).
- 28 Debra Rowe, "Sustainability in the Curriculum: Theory to Practice," Society for College and University Planning, Web conference, April 19, 2005 (More information available at <http://www.scup.org/profdev/notravel/curr.html>).

-
- 29 Geoffrey W. Chase and Paul Rowland, "The Ponderosa Project: Infusing Sustainability in the Curriculum," in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), p. 99.
- 30 Ball State University, Environmental Context for Business program overview, available at <http://www.bsu.edu/provost/ceres/Minors/Biz1.htm#program> (Accessed December 15, 2004).
- 31 Lewis & Clark College, Environmental Studies, available at <http://www.lclark.edu/dept/esm/> (Accessed April 18, 2005).
- 32 Dr. Matthew Tueth, phone interview, April 18, 2005.
- 33 *Ibid.*
- 34 Chase and Rowland, p. 92.
- 35 *Ibid.*, p. 97.
- 36 *Ibid.*, p. 101.
- 37 Jason F. McLennan and Peter Rumsey, "Green Edge: The Greening of Education," *Environmental Design + Construction*, November 11, 2004, available at http://www.edcmag.com/CDA/ArticleInformation/features/BNP_Features_Item/0,4120,137989,00.html (Accessed February 16, 2005).
- 38 *Ibid.*
- 39 Carnegie Mellon School of Architecture, available at http://www.arc.cmu.edu/cmu/about_sa/defining_interests.jsp?id=7 (Accessed April 4, 2005).
- 40 "CSU Graduate Project Turns Guggenheim Classrooms Green," Project Profiles, Colorado Building Green, U.S. Green Building Council, Colorado Chapter newsletter, June 2004.
- 41 Brian Dunbar, phone interview, March 3, 2005.
- 42 Orr, p. 171.
- 43 Education for Sustainability Profiles, "The Adam Joseph Lewis Center for Environmental Studies, Oberlin College," available at http://www.secondnature.org/efs/profiles/profile_oberlin.html (Accessed April 4, 2005).
- 44 Orr, p. 168.
- 45 Jonathan Thurn, "Environmental Center Making Progress," *The Oberlin Review*, May 28, 1999, available at http://www.oberlin.edu/stupub/ocreview/archives/1999.05.28/news_review/lewis.html (Accessed February 4, 2005).
- 46 Orr, p. 167.
- 47 *Ibid.*, p. 165.
- 48 *Ibid.*, p. 168.
- 49 Alex Frangos, "Green and Higher," *The Journal Report: Architecture Trends, The Wall Street Journal*, January 31, 2005.
- 50 *Ibid.*
- 51 Nancy Seideman, "Whitehead Building in the LEED," *Emory Report*, Emory University, September 6, 2002, available at http://www.emory.edu/EMORY_REPORT/erarchive/2002/September/erSept.9/9_9_02leed.html (Accessed February 4, 2005).
- 52 *Ibid.*
- 53 Lewis & Clark College, "A green-based partnership yields leadership in sustainability," press release, available at <http://www.lclark.edu/dept/public/howardpressroom.html> (Accessed April 20, 2005).
- 54 *Ibid.*
- 55 Greg Brown and Dennis Young, "Planning a Green Campus," *Environmental Design + Construction*, January 12, 2005, available at http://www.edcmag.com/CDA/ArticleInformation/features/BNP_Features_Item/0,4120,141761,00.html (Accessed January 27, 2005).
- 56 Bogo, p. 2
- 57 Dunbar, phone interview, March 3, 2005.
- 58 *Ibid.*
- 59 *Ibid.*
- 60 Nan Jenks-Jay, "Cultivating a Shared Environmental Vision at Middlebury College," in *Sustainability on Campus: Stories and Strategies for Change*, ed. Peggy F. Bartlett and Geoffrey W. Chase (Cambridge: MIT Press, 2004), pp. 306-308.
- 61 *Ibid.*, p. 309.
- 62 Leith Sharp, personal correspondence, April 6, 2005.
-