

The Greening of America's Campuses

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The largest university in Oregon is camouflaged, its many parts spread among the tight urban canyons of downtown Portland.

But one building at Portland State University stands out. It has a roof of grass, plants and gravel, like a slice of the high desert on the wet side of Oregon. It is 10 stories high, and inside, all the mechanical organs work with so little waste - pumping water, air and electricity to the 400 residents of the dormitory and, on lower floors, to classrooms - that it would impress even the thrifty New Englanders who founded Portland.

If it is true, as Winston Churchill said, that "we shape our dwellings, and afterwards our dwellings shape us," then Portland State's new residence hall, the Broadway, may be more than environmentally virtuous. Open barely a year, it is attracting students who say they want their campus home to be a living laboratory, even if that means low-flow showers are part of a 24-hour classroom.

"This building is really cool, and everybody likes being a part of it," says Micaiah Fifer, a junior who lives in the Broadway. "I appreciate the fact that this school is trying to be environmentally friendly. It's a reason to like the school."

The low water pressure, he admits, "gets to be a little annoying." Still, students are lining up to take on such challenges. More than a hundred students at the University of South Carolina, Columbia, were on the waiting list last fall for what is being promoted as the world's largest green dorm. Students had to write an essay stating why they wanted to live in the building, which opened in fall 2004.

Colleges have long marketed their campus amenities, their rosters of scholars, their selectivity and study-abroad programs. To that list, add one more thing: their green credentials.

From Berea College in Kentucky, where students designed a house that produces its own electricity, to Middlebury in Vermont, where local forests supply wood for construction, the greening of higher education is everywhere, showing signs of outlasting earlier, faddish fits and starts. Nationwide, more than 110 colleges have built or are building structures certified by the U.S. Green Building Council, a nonprofit group that promotes construction and designs that meet high standards of energy efficiency.

But it's one thing to put up a trophy of recycled glass and brick that relies on the sun, the wind or other renewable resources for power. It's another to build a curriculum - and to get students to look at the world differently - with green buildings as a centerpiece.

In Pittsburgh, students at Carnegie Mellon study the weave of grass, dirt and bugs atop its new "living roof" at Hamerschlag Hall. In class projects they study how the building design can reduce storm water drainage and

improve water quality. Yavapai College in Arizona and Harvey Mudd College in California have built classes around new ways to use the earth's resources, with campus designs as the prime exhibits.

The students, professors and designers behind this movement say they are part of a broad push for sustainability, which has become a buzzword for new schools of thought in architecture, interior design, urban planning, culinary arts and other fields.

At its simplest, sustainability means taking as little as possible from resources that cannot be renewed. A movement without real leaders, it seems to have the greatest resonance on college campuses, always a home for new thinking. Student groups and sessions dedicated to sustainability are flourishing. While some produce little but conversational - and political - gas, others are preaching practical solutions. At Drury University in Missouri, a campus conference on using natural resources ended with a posting of "10 simple ways to support sustainable living in the Ozarks." Among the suggestions: Shop at local food producers.

At last year's annual conference of the Society for College and University Planning, green buildings and ideas on how to spread eco-friendly practices dominated many discussions. With studies showing that students perform better in buildings with better (natural) light and cleaner circulating air, universities are taking their campuses out of the dark ages.

"What university leaders are telling us is that they now see this as an opportunity for recruitment," says Rick Fedrizzi, president of the green building council. "It signals to the potential student that this is an organization that gets it."

Because living lighter can save money, administrators say, they can - as the old line about prosperous missionaries has it - do well while trying to do good. With energy prices at record highs, and many economists predicting the end of the oil age within a generation's time, the college sustainability movement could play a big role outside the academic bubble. For example, by using lots of windows, mirrors and a big bank of photovoltaic cells, which convert sunlight to electricity, the University of South Carolina has reduced heating costs in its new residence hall by 20 percent and electricity costs by 40 percent, compared with a similarly sized conventionally constructed dorm. The system is the largest on the East Coast, university officials say, and shows that even a large apartment building can use a clean, renewable source of energy at relatively low cost.

"The sustainability movement is no longer a niche thing at most colleges," says Peggy F. Barlett, an anthropology professor at Emory University in Atlanta, who edited, with Geoffrey W. Chase, a book of essays on the subject. "There's going to be a real cultural transformation in the coming years in this area."

Barlett was behind the Piedmont Project, an effort to bring green sensibility to all parts of Emory. It started slowly, six years ago, but has lately taken off because of high energy costs and the desire of students and teachers to turn their ideas into practicality. Atlanta's environmental problems - stagnant air and poor water quality, sprawl, horrendous traffic jams - also prompted many on campus to take another look at their relationship with the natural world, she says.

The Piedmont Project involves little things (a literary class on eco-criticism, a student project on maintaining golf courses using minimal amounts of water and chemicals) and big things (two new green-certified buildings that are under construction).

The project was inspired by the pioneering Northern Arizona University, in the high pine-forested reach of Flagstaff. With its proximity to some of the world's most stunning scenery, Flagstaff, which attracts lovers of outdoor sports, has consistently been rated among the nation's most livable medium-size cities. The university has tried to match the setting.

"Kids who spend a lot of their time in national parks and outside are going to want to live in a campus that reflects their values," says Gary Paul Nabhan, director of the university's Center for Sustainable Environments. "A huge portion of our student body is motivated to be engaged in environmental issues."

Conferences, classrooms and buildings try to reflect this ethic. Administrators have declared that every new building must meet some degree of green construction and design standards, meaning that they use a high percentage of recycled building materials and incorporate low-energy-using lighting and electrical systems. Solar panels are abundant, making use of the sun at Flagstaff's altitude of 7,000 feet.

Even the janitors and land maintenance crews have been brought aboard. "Rather than a bunch of academics and student activists trying to ram some ideas down people's throats," says Dr. Nabhan, who is also a professor of environmental science, "we let the people who work on campus come up with ideas about how to use less, and we listen to them."

It was not so long ago when what fell from the sky in Pittsburgh caused people to rush indoors or cough. Soot and ash from the mills that gave the city its nickname, Steeltown, U.S.A., could block the sun and discolor clothes. But in the nearly two decades since the mills were shuttered, Pittsburgh has remade itself, with one of the city's best-known universities, Carnegie Mellon, in the forefront.

The living roof of Hamerschlag Hall sprouted four years ago from a "why not?" idea of three students who were members of the campus Sustainable Earth Club. With an undergraduate research grant, the students studied other green roofs and drew up a general plan; students of architecture and engineering in an advanced sculpture studio class designed it last spring.

The roof, which cost \$172,000, is a showpiece, with its grasses, perennials and a log drilled with holes to encourage insects to settle in. Instruments were installed to measure water runoff, water quality, and heat loss and retention in the building, with monitors installed on a traditional roof nearby so data could be compared.

Elsewhere on campus, the energy-saving gadgets and systems of New House - the first green dormitory to open in the country, according to Carnegie Mellon officials - have also become teaching tools. Now in its third year, the five-story, 260-bed residence uses 30 percent less energy than a typical building of the same size, and it came in under budget. A kiosk

shows the daily energy use and compares it with previous days, making students aware of their daily impact on the resources needed to house them. Carpets are made of recycled fiber and the doors were certified by sustainable forestry groups. Campus environmental groups use New House as a home.

"This is very much a living laboratory," says Tim Michael, director of housing and dining services at Carnegie Mellon. "The building is constantly being studied by students, architects and engineers." He says Carnegie Mellon is moving toward applying the same stringent green-building standards to all its major new construction.

Beyond the well-insulated walls of New House, Carnegie Mellon has been trying to integrate sustainable theory in many aspects of campus life and curriculum. Teachers at the new Center for Sustainable Engineering, in collaboration with like-minded colleagues at the University of Texas and Arizona State University, want to revolutionize teaching at the nation's 1,500 engineering programs. Supported by a \$1.7 million grant from the National Science Foundation, the center holds workshops and develops educational materials meant to get students to think about energy efficiency and recycled material.

"The whole purpose of this is to take some of the ideas of sustainability out of the fringes and put them into the mainstream," says Cliff Davidson, a professor in civil and environmental engineering and a co-founder of the center.

It helps to have a shiny new example of what all the fuss is about. That is the case with the University of South Carolina's new residence hall, West Quad, which has been certified by the environment-friendly building council. About 500 students live in the complex of three four-story buildings, which includes a learning center where classes on the environment are taught.

There is a perception that a green dorm is going to force a monastic life on students, but West Quad residents insist they are not uncomfortable. No cold showers or dimly lighted study halls, they say.

"The thing I notice most is the air quality," says Lindsey Cooper, a graduate student who lives at West Quad. "They are constantly filtering in new air. And the lighting is so reliant on natural lights that I don't even feel like I use electric lights very much."

West Quad has become the iPod of buildings. "It's clearly the most popular hall on campus," says Gene Luna, a university vice president. Plans are under way to build a green fraternity house.

As at Carnegie Mellon, the building is a learning opportunity. Biology majors have experimented with different plants, trying to create an attractive landscape that uses a minimal amount of water. Engineering students monitor the energy output provided by simple daylight to heat all those hot showers.

"This building has just exceeded our expectations in every way," Dr. Luna says. "You can't traverse across the West Quad complex without learning something."

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