THE NEW ENGLAND JOURNAL OF HIGHER EDUCATION

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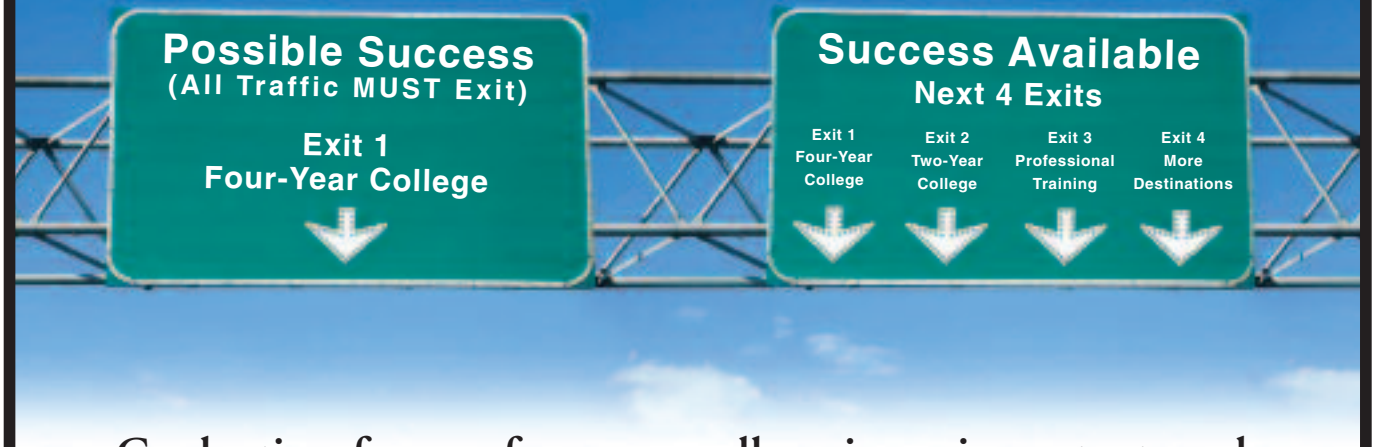

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EDITOR'S MEMO

Earth Day, Every Day

If I might borrow a lyric from Kermit the Frog (and from one of New England's finest songwriters, Joe Raposo), it isn't easy being green. Kermit sings about how challenging it can be to have skin of a color different from those around you. My reference, of course, is to the difficulty of *going green* in a society consumed by over-consumption.

In this issue our Forum focuses on New England college and university efforts toward sustainability. Indeed, the academic community is part of a growing green building boom. In 2000, there were just 573 projects pursuing the U.S. Green Building Council's LEED certification, whereas today there are more than 16,000 such projects underway nationally.

Of course, others see green in a whole different way. Even Earth Day has its critics. Since 1970, when April 22 was established as a day to highlight concern over pollution of the soil, air and water, it has been an enormous PR success, observed in 140 nations with outdoor performances, street fairs and TV programs that focus on environmental issues. But it's questionable whether the movement has had an effect on the overdevelopment, global warming and overpopulation that afflict planet earth.

"The biggest problem with Earth Day is that it has become a ritual of sympathy for the *idea* of environmental sanity," say Alex Steffen and Sarah Rich on *WorldChanging.com*. "Small steps, we're told, ignoring the fact that most of the steps most frequently promoted (returning your bottles, bringing your own bag, turning off the water while you brush your teeth) are of such minor impact (compared to our ecological footprints) that they are essentially meaningless without larger, systemic action as well."

The strategy of starting small (with recycling) and moving on to bigger challenges has failed, Steffen and Rich suggest. "It is, essentially the politics of gesture, little different than wearing a rubber wristband or a pink ribbon, and, [as such] is primarily a means of raising money for large NGOs while making regular folks feel a little better about their relationship to a terribly flawed system. It's a broken model, and we can do better."

Meanwhile, as some politicians campaign on the need to drill offshore for oil, voters seem sublimely indifferent to the fact that there is no comprehensive U.S. energy policy. We have a drug czar in Washington — why not an environmental czar?

"So much of it has to do with leadership," Thomas Friedman, author of *Hot, Flat, and Crowded*, recently told *Time* magazine. "For the last eight years, we've had a president and vice president who have basically said our use of oil is a God-given right. Imagine if our president said tomorrow, 'I'm going to get rid of my armor-plated limousine and I'm going to have an armor-plated Ford Escape hybrid.'" (Politicians, please note that Ford recently announced developing "sturdy yet quickly biodegradable soybean seats" that are "one of many examples of Ford's commitment to environmentally sustainable materials.")

On campuses across the United States, every day is Earth Day, and doing better means taking a green approach in all things great and small. For instance, according to the Associated Press, some 500 colleges and universities are considering removing plastic trays from dining halls. At the university where I teach, there are roughly 8,000 students on a meal plan. No trays in the dining halls could mean a reduction in wasted food — as students carry only food they intend to eat, not sample and then discard — and less water used for cleaning. This would save 3,000 gallons of water daily.

Down here at campus quadrangle level, colleges and universities are recycling, collecting gray water to flush toilets, eliminating plastic cafeteria trays… small steps, perhaps, but the start of a longer journey.

John Brady *is acting editor of The New England Journal of Higher Education. E-mail: brady@nebhe.org*

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Financial Insecurity

While pundits analyzed the effect of September's market collapse on financial mammoths, many Americans had already experienced firsthand the weaknesses and inequities of the U.S. economy. Middle-class economic security increased through the 1990s but began deteriorating after 2000, and all gains in security were erased within a few years, according to a report by the Center for American Progress, co-written by Center senior fellow and University of Massachusetts Boston associate professor of public policy Christian E. Weller.

The report, *America's Middle Class Still Losing Ground*, attributes middle-class financial insecurity to falling incomes, rising prices for necessities and the decimation of personal wealth.

The sharpest deterioration in middle-class financial security is associated with paying for medical emergencies. The center estimates that less than 34 percent of families had enough wealth in 2007 to cover the cost of a medical emergency, down from almost 44 percent in 2000.

The center also found that the share of families who could weather an unspecified emergency equal to three months of income shrank to just over 29 percent in 2007, down from more than 39 percent in 2000. Also in 2007, only 44 percent of families had enough wealth to cope with a spell of unemployment, down from 51 percent in 2000 — and the labor market only tanked further in 2008 after the study was completed.

More dreary findings from the Center for American Progress:

Joblessness and inequities. In July 2008, the U.S. unemployment rate was 5.7 percent — the highest since March 2004. The African-American unemployment rate was higher, at 9.7 percent, and the Hispanic rate was 7.4 percent.

Flat wages. Factoring in inflation, hourly wages were only 0.9 percent higher and weekly wages were 0.3 percent *lower* in June 2008 than in March 2001.

Less coverage. In another measure of declining economic insecurity, the share of private-sector workers with a pension dropped from 50 percent in 2000 to 43 percent in 2006, and the share of people with employer-provided health insurance slid from 64 percent to under 60 percent.

Housing woes. New home sales in May 2008 were 33 percent lower than a year earlier, and existing home sales were nearly 16 percent lower. Prices for existing homes fell by 6 percent and for new homes by almost 3 percent from June 2007 to June 2008. The total values of all homes fell by 2.5 percent or $417 billion in the first quarter of 2007 — the largest drop in more than three decades. Home equity as a share of home values also fell to a record low of 46 percent in the first quarter of 2008, and the share of all mortgages in foreclosure reached a record-high of 2.5 percent that quarter.

Oil and gas prices stay high. The price per barrel of light, sweet crude oil in early August 2008 was nearly 65 percent higher than a year earlier — a period when gasoline prices increased by almost 37 percent.

People paying more for basics. From March 2001 to June 2008, food prices rose by 24 percent, fuels and utilities by 48 percent, medical care by 35 percent, transportation by 34 percent, and college tuition by 67 percent.

****

A study by the University of Massachusetts Donahue Institute shows the gap between rich and poor in Massachusetts has widened since the Bay State's "miracle years" of the 1980s. Following those heady years only families in the top 20 percent of the income scale experienced substantial gains. Adjusted for inflation, their median family income rose 11 percent between 1989 and 2006, while the earnings of middle-class families were flat and the earnings of the poor fell.

In an interview with the *Boston Globe*, Donahue study co-author Rebecca Loveland attributed the worsening income gap to the disappearance of Massachusetts manufacturing jobs that had once offered less-educated, less-skilled workers a path to middle-class wages.

Donahue analysts report that the difference in inflation-adjusted median income between Massachusetts families in the top 20 percent of income and those in the bottom 20 percent soared from $109,000 in 1979 to $156,000 in 2006. If fact, Connecticut, Rhode Island and Massachusetts held the dubious distinction of ranking 1st, 2nd and 3rd nationally in the greatest increases in income inequality between the top fifth of earners and the bottom fifth between the late 1980s and mid-2000s, according to census data.

To the People's Health

Long hosting New England's only program in osteopathic medicine, the University of New England has launched another first: an online journal focusing on the growing field of "population health."

The population health field includes health promotion, disease prevention, international and environmental health, injury prevention, clinical practice and medical technology and consumers' use of health information on the Internet.

Last June, the Biddeford, Maine university published the inaugural issue of the *Online Journal of Population Health*, which features original research and book reviews from UNE students and contributors in the fields of osteopathic medicine and public health.

Among articles featured in the July 2008 issue: In "Right-Clicking Medicine," John-Paul Bettencourt explores the role of the Internet in modern healthcare. Patrick Hohl writes on "Health Disparities: Elevated Asthma Rates Among Minority and Low Socio-economic Status Populations." Suzan R. White contributes, "Informed Thrills: Motorcycle Safety and Risk Factors."

The *Online Journal of Population Health* is available at www.une.edu/com/ojph.

SHORT COURSES

Merging in Vermont

Experts used to joke that changing the direction of a higher education institution was more difficult than turning around a supertanker. Don't tell that to Vermont folks. Just a few weeks after Union Institute & University announced plans to sell the campus of the former Vermont College and three MFA programs to a newly created Vermont College of Fine Arts, two other Vermont colleges — Champlain and Woodbury — unveiled plans to merge and create The Woodbury Institute at Champlain College.

Under the merger plan, Champlain College in Burlington will take over the tiny Montpelier-based Woodbury College. Woodbury students and faculty will see little change during the 2008-09 academic year, but as the merger is finalized, students from both institutions will have more course options available to them.

Champlain President David Finney said the merger will give Champlain added strength in Woodbury's specialties — legal studies, mediation and advocacy — and provide the school with two new graduate-level programs. "This is a smart move for both our institutions and one that will benefit our students, now and in the future," Finney said in a statement.

In July, Union Institute & University disclosed the latest phase in its strategic effort to reposition itself as a "university without walls" focused more on people and programs than physical buildings. UI&U announced it would continue to operate its bachelor and master's programs while leasing offices and classrooms from the new Vermont College of Fine Arts.

UI&U enrolls more than 1,700 students in low-residency undergraduate, master's and doctoral programs. UI&U's centers in Montpelier and Brattleboro serve more than 450 students.

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Mount Ida College's new residence hall, set to open later this summer, was financed with a $26.8 million tax-exempt bond issue through HEFA. The college needed a quick and seamless transaction to complete the project, and HEFA helped to make that happen. Come September, this new energy-efficient dorm will provide housing and all the technology needs of the twenty-first century student.

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Student Loan Availability: Disaster Averted, but Worries Remain

MICHAEL K. THOMAS

The predictable rhythms of fall's arrival and students' return to New England's colleges and universities occurred in fairly normal fashion this year. Their arrival was preceded, however, by several months of uncertainty among college financial aid officers, stemming from the turbulence in global financial markets, the subprime lending crisis and stock market downturns.

In August 2008, in partnership with The New England Council, NEBHE surveyed financial aid officers from 214 of the region's campuses to determine whether students and families were able to secure higher education loans for academic year 2008-09.

Further, the survey sought to assess the impact of the "Ensuring Continued Access to Student Loans Act of 2008" and to determine any other financing issues higher education institutions, students and families faced. (*The complete report is available online at www.nebhe.org.*)

Survey results revealed that students and parents experienced only limited problems accessing federal student loans for fall 2008. Survey respondents reported:

- No major concerns about the availability or adequacy of Federal Family Education Loan Program (FFELP) loans made by banks and other private lenders for students and parents for fall 2008.
- Instances in which students have not been able to attend college due to inadequate loan availability have been the exception.
- Large increases in the volume of unsubsidized Stafford loans, and students consistently taking advantage of the $2,000 increase in borrowing limits for unsubsidized loans.
- A distinct increase in applications for parental PLUS loans, compensating for the decrease in the availability of private/alternative loans. Also, new features including deferment options have made PLUS loans more appealing for parents who would have otherwise considered private/alternative loans.
- Colleges were further pursuing the Direct Loan program, with loans made directly from the U.S. Department of Education, as a result of the uncertain lending environment.

Respondents consistently reported that the legislation had resulted in greater burdens on their offices, including students signing new Master Promissory Notes, increased reporting requirements and higher administrative costs.

Despite the benefits of the legislation, respondents noted that poor credit has delayed and complicated the process for some borrowers. For example:

- More PLUS and private/alternative loans have been denied.
- Far fewer private/alternative loans have been available and stricter co-signer requirements have been instituted.
- Borrowing "restrictions" (i.e., higher interest rates and more stringent credit standards) have increased, while "benefits" (i.e., higher fees and fewer repayment benefits) have decreased.

Any *unfavorable* consequences of the 2008 loan legislation were limited to delays and complications with loan processing. Respondents noted that significant time was required to keep students and parents informed of changes, requirements and loan alternatives.

While worst-case scenarios and instances of students being unable to enroll have been generally averted, further concerns remain about the availability of funds in early 2009 and in the following academic year.

College leaders report that the financial circumstances of students and their parents continue to change, including additional job losses, foreclosures and other financial challenges. The high cost of higher education in New England, a continued reduction in private/alternative loans and more stringent credit standards could increasingly impede students' ability to borrow and remain in college.

Further, while direct lending may increasingly be a solution for schools, the importance of FFELP lending to students, institutions and the region is critical. State lending authorities and guarantee agencies engaged in FFELP lending, for example, also offer substantial college awareness outreach activities, savings programs, financial aid counseling and access services.

NEBHE and The New England Council will continue to monitor these issues and welcome the perspectives of New England's college and university leaders. We will share these perspectives with members of the New England Congressional delegation and with state leaders to help ensure that policy and legislation keep pace with students' needs for loans. We will also work to bring the broader issue of higher education finance back to the fore and engage state and federal leaders in revisiting the structures, programs and assumptions that drive the current system.

Michael K. Thomas *is interim president and CEO of the* New England Board of Higher Education *and publisher of* THE NEW ENGLAND JOURNAL OF HIGHER EDUCATION.
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Community Colleges Going Green

JOAN MENARD

It has been more than two years since Al Gore's *An Inconvenient Truth* opened many eyes to the consequences of global warming and unleashed a wave of all things "*green*." Now, one need only walk down the supermarket aisle, scan the web or turn on any television channel to experience the constant hum of "*green noise*" — digital information, misinformation, marketing messages, documentaries — designed to influence our opinions and actions when it comes to environmental stewardship and awareness.

Fortunately, we can look to New England higher education for prime examples of forward-thinking responses to today's environmental imperatives. As reported in this issue, five of the 11 colleges and universities listed in *The Princeton Review*'s Green Rating Honor Role are New England institutions. And, presidents of 89 New England colleges and universities are among the 523 to date who have signed the American College and University Presidents Climate Commitment (ACUPCC), a pledge to meet ambitious goals and requirements and to eliminate greenhouse gases from their campuses over time.

One might suppose that only institutions with flush endowments and overflowing construction budgets can incorporate sustainability into their mission and turn a commitment to the environment into action. Nothing could be further from the truth.

Cape Cod Community College (CCCC) president Kathleen Schatzberg is one of the most outspoken advocates in all of higher education for the reduction of greenhouse-gas emissions and reaching carbon neutrality. The community college's position as an environmental leader dates to 1996 when it began testing electric utility vehicles as replacements for gasoline-powered maintenance trucks. Today, the college's fleet of electric vehicles continues to eliminate hundreds of tons of airborne pollutants each year — and they are recharged with renewable electricity from CCCC's solar panels.

The college's Lorusso Applied Technology building was the Commonwealth's first publicly financed LEED-certified building. Moreover, the project was the impetus for a major state policy change: Today, all new state buildings and major renovations in the Commonwealth must meet LEED standards.

Impressive recycling efforts, the purchase and use of recycled and environmentally preferable products; water conservation, including an 8,000-gallon rainwater capture and diversion system; and "zero impact" landscape design and management are all standard operating procedures at CCCC. Even the president's car reflects the campus's commitment, Schatzberg has driven a Prius Hybrid since 2005.

Another New England community college is a leader in employing cutting-edge technologies to reduce emissions and expenses. Mount Wachusett Community College (MWCC) converted its all-electric main campus to a biomass heating system in 2002. Since then, the college has reduced its carbon footprint by more than 22 percent; cut electricity usage by 38 percent; water usage by 52 percent; and saved nearly $3 million.

MWCC was able to implement this huge conversion at zero net cost to the institution through the wise use of federal and state grants and a performance contract with the energy service company NORESCO. The resulting energy savings provides a significant environmental and health benefit from the reduction of air pollutants that extends beyond the campus. Emissions reductions include 11,000 tons of carbon dioxide, 18 tons of nitrogen oxide and 47 tons of sulfur dioxide. This translates to the equivalent of planting 3,012 acres of trees and removing 1,920 cars from the roads.

Community colleges also play key roles on the academic side of sustainability and environmentalism. The American Solar Energy Institute estimates that more than 8 million Americans worked in renewable energy and energy efficiency industries in 2006 and this number will grow as the nation commits itself to reducing greenhouse-gas emissions. A 2008 report by the Apollo Alliance, in collaboration with Green For All, says that many jobs in the new "green economy" require the type of training acquired at the certificate or associate degree level. Some of these positions are bridges to high-skill professional jobs; others bring entrepreneurial opportunity; and some provide a pathway from poverty to the middle class.

Exemplary programs of study can be found at many of the region's community colleges. The new green economy is growing fast, and the role community colleges play in building a green workforce to support this new economy is crucial.

Joan Menard *is chair of the New England Board of Higher Education. She is a Massachusetts state senator representing the First Bristol and Plymouth district. She has served in the Massachusetts Legislature for 28 years. E-mail: catherine.donaghey@state.ma.us*

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Education by the Numbers

Why education is a smart investment in an uncertain economy

JAKE LUDES III, EVA I. KAMPITS AND NADIA ALAM

As a receding economy contributes to public anxiety about jobs and an uncertain financial future, education becomes a target of state and local cuts. Reducing education funding does not help solve economic woes, however. According to the most recent economic impact report of the New England Association of Schools & Colleges (NEASC), cuts in expenditures for K-12 education have a reverse effect: they slow the growth of education as an economic engine and harm the higher education community as students progress through the pipeline.

NEASC's economic impact assessment, the only known study to explore the economic impact of New England K-12 schools and higher education institutions in combination, finds that investment in New England schools and higher education institutions reaps tremendous *short-term* returns to the regional market. Yet these short-term benefits are ordinarily overlooked by the public and even by elected officials. Perhaps this is inevitable since most studies and news features emphasize long-term returns in education investments, such as lower taxpayer spending on crime and welfare, higher personal wages and, in turn, a rise in state income. While the long-term returns to educational investment are undoubtedly significant, the short-term rewards are less frequently studied, and therefore not known or valued by most people.

Economic impact assessments typically highlight positive short-term returns from a given financial investment (e.g., job-growth, increase in innovation, rise in inter-industry commerce, revenue growth for local businesses, etc.). It is for this reason that economic impact assessments are a useful tool for educational institutions. By shedding light on the immediate rewards brought about by educational investment, educational institutions can garner financial support from the public and elected leaders. After all, the education sector not only provides jobs to thousands of New Englanders; it also propels substantial inter-industry commerce through expenditures on a vast array of goods and services.

Perhaps the most notable finding from NEASC's study is that the collective economic impact of accredited public and independent K-12 schools together with higher education institutions amounted to $114.7 billion in fiscal 2006 (the latest year that comprehensive audited school financial data are available). This is a significant increase from the previous study, which found that, just two years earlier, accredited educational institutions in the six-state region had an economic impact of $93.5 billion. Thus, in two years, the identifiable economic impact of our member schools, colleges and universities rose by $21 billion or 23 percent.

Economic Impact of NEASC-accredited Schools & Higher Education Institutions, Fiscal Year 2006

	K-12*	Higher Education	Total
Conn.	$4,333,831,789	$23,898,163,309	$28,231,995,098
Maine	$805,627,098	$2,559,180,457	$3,364,807,555
Mass.	$6,685,000,576	$63,401,995,243	$70,086,995,819
N.H.	$1,953,464,467	$4,666,527,797	$6,619,992,264
R.I.	$825,128,608	$3,052,221,444	$3,877,350,052
Vt.	$422,241,001	$2,072,508,598	$2,494,749,599
Total	$15,025,293,539	$99,650,596,848	$114,675,890,387

**Includes public and independent schools*

The economic impact of accredited schools, colleges and universities in New England even exceeds the total combined public expenditures of these states, which totaled $85 billion in the fiscal study year of 2006. NEASC's figures are conservative because a "multiplier" to measure the additional secondary impacts produced by offshoot spending was avoided intentionally. The incorporation of a multiplier would easily double or triple the economic impact of our institutions. However, NEASC favors focusing strictly on the direct and short-term impacts on the economy because this enables the public and policymakers, with whom the association regularly shares this information, to grasp the impact of educational institutions more concretely. In other words, for many people, multiplier impacts are ambiguous or theoretical — even viewed with skepticism, since they are thought to inflate economic impact estimates.

In the years ahead, NEASC anticipates that the economic impact of schools, colleges and universities and the subsequent ripple effects on employment will continue to expand, especially since higher percentages of the population are enrolling in postsecondary education and many of the region's schools are aging, so significant amounts will be spent on construction, capital improvements and technology upgrades.

Indeed, educational spending has a significant impact on industries like construction, transportation, multimedia, sports, healthcare, publishing and others that supply goods and services to schools on a large scale. Analyzing data from the U.S. Census Bureau,

NEASC found that expenditures on everyday K-12 school operation and maintenance amounted to more than $2.4 billion in fiscal 2006 while expenditures on instructional supplies were more than $525.6 million.

By shedding light on the immediate rewards brought about by educational investment, educational institutions can garner financial support from the public and elected leaders.

The same year, these schools spent more than $1.1 billion on student transportation and nearly $782 million on school food services. New England's schools spent more than $5.7 billion providing employee benefits. According to *School Planning & Management's* 2008 *Annual School Construction Report*, roughly 30 percent of New England's school districts finished or planned to initiate construction projects in 2007. *School Planning & Management* also reports that New England's K-12 school districts spent nearly $1.1 billion on school construction projects finished in 2007, and nearly half of this ($529.8 million) was spent on new school construction. Approximately $189.4 million was spent on building additions and $357.1 million spent on renovations.

Education Stimulus Package

Not surprisingly, New England's higher education institutions are a major financial stimulus in the region. NEASC's study makes a clear case for investment in higher education to stimulate regional economic development, citing that the economic impact of NEASC-accredited higher education institutions amounted to $99.7 billion in fiscal 2006. Note that NEASC accredits more than 95 percent of higher education institutions in the six-state region. Within New England's 71,992 square miles, 255 NEASC-accredited institutions of higher education enrolled 884,894 students in fiscal 2006, representing 6 percent of the New England population. The sheer number of students concentrated in the region makes New England a hub of student (and visitor) spending.

The presence of many world-class institutions attracts thousands of foreign students to New England each year. The Institute of International Education (IIE) reported that New England attracted 43,136 foreign students in academic year 2005-6. IIE reports that through their spending on tuition, living, transportation and other expenditures, foreign students had an estimated economic impact of $1.3 billion on the region's economy.

Fueling the Knowledge Economy

The staggering number and density of colleges and universities fosters the growth of human capital to feed an increasingly knowledge-driven economy. The cluster of teaching hospitals, medical centers and engineering and biotechnology firms are, in effect, the offspring of a thriving higher education sector. This might explain why Boston, the city that boasts the highest concentration of college students nationally, outranked all other U.S. cities in the amount of grant money won from the National Institutes of Health, snagging $1.6 billion in fiscal 2006.

New England's higher education institutions are responsible for generating considerable employment in the region. In fiscal 2006, the 484,340 people employed in education exceeded the number of people employed as healthcare practitioners (399,680) or as business and financial services employees (333,700) regionally. Education not only employs thousands, but is also one of the fastest growing sectors. The Federal Reserve Bank of Boston reports that the sectors that have created the most jobs in New England from December 2006 to December 2007 are education and health services.

On their own, New England's higher education institutions are responsible for generating considerable regional employment, probably more than the average citizen recognizes. In fiscal 2006, NEASC-accredited higher education institutions employed 137,014 people on a full-time basis. In fact, NEASC's report, which incorporates data from the U.S. Census Bureau, finds that the number of full-time employees at these institutions is greater than the *combined* total of doctors, police officers, construction laborers, dentists, pharmacists, and computer programmers in New England.

When education budgets are cut, a ripple effect hits other businesses that produce goods and services purchased by schools. A recent report issued by the Massachusetts Department of Education states per-student expenditures on instructional services have remained stagnant from 2002 to 2007, while inflation has risen. Insufficient investment in human capital has significant long-term consequences on growing a knowledge-based economy. The strength of New England's economy is unequivocally affected by the region's investment in K-12 schooling because the preparedness of high school graduates impacts their performance in college and subsequently in the labor force.

In other words, we all gain when we invest in our educational institutions; we all lose when we do not invest enough. As New England's economy becomes ever more reliant on the knowledge capital of a college-educated workforce, the need to have robust educational institutions through the K-through-postsecondary pipeline is more imperative than ever before.

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Access to a College Degree or Just College Debt?

Moving beyond admission to graduation

DEBORAH HIRSCH

A defining feature of U.S. higher education is its commitment to access and opportunity. The growing number of policies and programs targeting college access demonstrates that this commitment remains steadfast. In order to make college affordable for the economically disadvantaged, an increasing number of selective, well-endowed colleges and universities, including Amherst, Brown, Harvard and Wellesley, have developed policies of free or reduced tuition. Other colleges and universities, including Clark University, Curry College and University of Massachusetts Boston, have created pipelines into their institutions through partnerships with high schools or districts, early college and/or dual enrollment, and special bridge programs.

College access programs that prepare students to aspire to and apply to college are important but not sufficient. While access to a college education, especially for underrepresented student populations, has improved, similarly upward trends in college graduation rates have failed to materialize. Access into an institution is important, but if students fail to graduate, then it becomes access to debt instead of access to a degree. Moreover, as costs increase and employment opportunities for those without a degree decrease, the consequences of not graduating have become dire. Accreditation groups, legislators, prospective students, their families and funders are increasingly holding colleges and universities accountable for student retention and graduation. Therefore, the focus of efforts to improve access has moved from college admission to college graduation.

Researchers and practitioners have learned much about the reasons students drop out and what colleges can do to retain them. While the tendency is often to create a "Retention Committee," "Retention Office" or "Retention Program," this focus may not achieve the ultimate goal of improving student success. What is needed is sustained commitment to allocating the resources, time and effort to improving student success and achievement, which in the end will also produce the desired retention results.

Unfortunately, there is no quick fix or generic solution to improving students' academic success and graduation rates. Most retention programs focus on students' first year of college because this is when students are most likely to drop out. However, getting students on track to graduate actually begins before students enroll in college and continues as they move through identifiable milestones toward graduation.

Preparation for College. Research indicates that the path to a college degree begins long before students enter college. While the Education Trust has promoted the concept that "college begins in kindergarten," most college access programs target middle school aged children to ensure they have the aspirations and preparation to pursue a postsecondary degree. By seventh grade, students and families need to be academically on track to enter a college-preparatory curriculum in high school. As former U.S. Education Department analyst Clifford Adelman observed in *The Toolbox Revisited: Paths to Degree Completion From High School Through College*, this includes, at minimum, four years of English and four years of math, including Algebra 2. We also know, from Center for Education Policy Research director David Conley's *Toward a Comprehensive Conception of College Readiness*, that students must begin to acquire the skills and competencies, including time management, organization, note taking and study skills, which are as necessary for college success as content knowledge. A number of college-prep programs including: AVID (Advancement Via Individual Determination), College Bound, and GEAR UP focus on developing these academic behaviors and habits of mind alongside core academic subject knowledge.

Colleges and universities have created extended orientation and first-year programs to help students establish a strong support system and develop connections to the college community.

High School-to-College Transition. Even when students have been successful in getting into college, data on student attrition indicate that they are particularly vulnerable during their freshman year and specifically during their first semester. This may be because they aren't well prepared for the increased demands and expectations of college or because they have not yet become engaged and integrated into their college environment. Colleges and universities have responded by creating extended orientation and first-year programs to help students establish a strong support system and

develop connections to the college community. Recently, Holy Cross expanded its optional first-year program, which created living/learning communities among freshmen. The program is now a requirement for all incoming first-year students. Additionally, an array of programs designed to ease the transition have become *de rigueur* on most college campuses. Examples include summer bridge programs, freshman seminars, linked courses, small learning communities, peer mentors and academic coaches.

Despite these supports, many students enter college unprepared for college-level work. In 2006 ACT reported that three out of four ACT-tested high school graduates were not prepared to take credit-bearing, entry-level college courses. While many higher education institutions offer developmental, review or remedial courses to prepare students to succeed academically, they tend to follow a "one size fits all" approach, rather than tailoring instruction to meet the specific challenges students face. Typically, these courses are staffed by low-paid, transitory faculty and their high failure rates result in students becoming stalled and discouraged from pursuing college degrees. Community colleges have been at the forefront of innovation in the area of developmental coursework, but few of these practices have made their way to public and private four-year colleges and universities.

Recognition of the notorious "sophomore slump" has spawned new initiatives to monitor and support sophomores, including retreats, seminars, special housing and extra advising.

A recent trend in college retention programming is to focus on parents and significant others. Results of the annual Cooperative Institutional Research Program Survey of college freshmen indicate that students turn to and value their parents' help in transitioning to college. Not surprisingly, many colleges and universities are creating special orientation sessions, newsletters and networks to help parents and guardians learn how to support their child's successful transition to college and adulthood. Further development in this area is needed to address the special concerns and issues of students and families who lack college-going experience.

College Progression. Colleges must continue to monitor students' progress beyond the first year and devise strategies to detect students who are struggling and implement interventions to help them get back on track toward graduation. "Early alert" programs allow faculty and staff to identify students who may not be attending classes, who may be performing subpar academically, having financial difficulties or exhibiting anti-social behavior in or out of class. Once identified, these students can receive active intervention by an adviser, academic coach or mentor to ensure that they get the help they need to be successful. Western Connecticut State University, St. Joseph College and Mount Ida College, among others, use an early alert system to flag students who may need intervention and referral to address challenges before they escalate.

Recognition of the notorious "sophomore slump" has spawned new initiatives to monitor and support sophomores, including retreats, seminars, special housing and extra advising. These programs are less widespread than first-year programs, but are becoming increasingly popular. Bridgewater State College, Green Mountain College and Brandeis University are among a growing list of colleges and universities that offer special programs targeting sophomores. Ultimately, these programs seek to wean students off the additional support, assuming that by the time students are juniors and seniors, they are fully engaged in their program of study and campus life.

College Graduation and Beyond. In a global, information-based economy that demands a highly skilled and knowledgeable workforce, the employment prospects for students who do not graduate from college are grim. With increased employability and earning power as incentives, students can be counseled to take advantage of internships, study-abroad programs and combined undergraduate/graduate programs. Some colleges offer senior seminars for students to synthesize and integrate their four-year learning experience. At Mount Ida College, for example, seniors are required to take capstone courses where they work under the close direction of faculty in fieldwork, research and independent study. In addition to preparing students for the world of work, these experiences often have a positive effect on retention.

Attention to improving college access, especially for underrepresented populations, is an important priority. But while preparing students to apply and enroll in college is a worthy goal, the focus needs to extend beyond college admission to ensure that students succeed academically and persist to graduation. In an era of scarce resources, this will require a new level of collaboration and cooperation between schools, colleges, nonprofits and corporate partners to ensure that students are able to earn a degree and not just accumulate debt.

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A Test We Must Pass

We must recognize that knowledge is obtained in various ways and begin to measure competency similarly

NICHOLAS C. DONOHUE

As New England continues to experience dramatic demographic shifts, it becomes increasingly clear that our future prosperity will depend on how well we prepare all learners for postsecondary success. If New England is to produce engaged, prosperous citizens, we must begin to expand our notion of what skills and knowledge learners need to acquire. If we do that, our region's higher education community must also expand how we measure those skills through multiple, varied assessments of student competency and achievement.

New England 2020, the Nellie Mae Education Foundation's report, predicts a decline in the number of the region's citizens with postsecondary credentials. The high cost of living in the area has driven some graduates out, and many longtime residents are either leaving the region or "aging out" of the workforce. New England has been fortunate, however, to see an influx of immigrants and minority students to make up for the capacity it is losing. Although not served well by public education systems traditionally, these populations will continue to be a vital component of the region's success.

The telling statistic that those holding college degrees earn $1 million more in their lifetime than those who do not continues to resonate with societal implications: The more citizens attain at a postsecondary level, the more fiscal input communities have into our cyclical economies; the more people earn, the more they purchase goods and services and pay taxes. When you also consider that well-educated citizens tend to be more productive, healthier, and more likely to be civically and culturally engaged, you begin to form a picture that we are just beginning to acknowledge — our collective future is in no small part dependent on the success of *each other*.

Preparing people for success has always been a moving target of sorts. What skills do people need to become civically engaged and economically self-sufficient? In recent years it has become increasingly evident that while basic skills are essential, the "3 R's" are not enough once learners enter secondary school. So-called "21st century" skills — innovation, creativity, the ability to work as part of a team, and to work through complex problems and find solutions — are becoming increasingly important in the new economy and interconnected world.

Measurement and assessment issues follow quickly from any discussion of integrating these "new" skills. Standardized tests still have a place in providing assessments of certain skills, but I've yet to see the written exam that can accurately measure one's ability to work within a team creatively. We must recognize that knowledge is obtained in various ways — through different methods in different places — and begin to measure competency similarly. Moreover, we must not go careening forward without discipline. High-quality varied assessment can only succeed where there is a shared understanding of what is required of learners and educators.

Performance-based assessments (also known as "applied learning" or "real-world" assessments) allow students to demonstrate competency through a number of activities, including mentorships, internships and portfolio building. There are already examples of performance-based assessments being used across the region at the K-12 level to complement traditional classroom testing. For example, with the class of 2008,

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Rhode Island began utilizing multiple assessments in high school graduation requirements. Rhode Island students must now be able to demonstrate skills and knowledge though a variety of assessments, including portfolios and projects, in addition to performance on more traditional measures. In New Hampshire, the Nellie Mae Education Foundation has partnered with the New Hampshire Department of Education and PlusTime NH to develop and support the Expanded Learning Opportunities pilot program at four high schools. This work is rooted in regulation changes that promote more educational options for learners, including credit for learning that takes place outside of the traditional classroom. In order to gain credit, students must demonstrate that, as a result of the experience, they have gained knowledge and skills and have met pre-established course competencies. For example, learners might receive partial credit for work at a magazine or newspaper; or students can gain math or science credits for demonstrated work within information technology.

In both instances, students need to demonstrate to the satisfaction of a highly qualified teacher that what they have learned ties back to pre-determined requirements. Those established criteria are vital, as without them, otherwise- useful demonstrations of knowledge become nothing more than watered-down exhibitions, and counterproductive to all involved.

Measuring achievement through performance is not new to higher education. Most instructors apply their judgment daily against a wide range of evidence in order to determine grades. Discussions of system-wide assessments in higher education are unavoidably linked to accountability, however, and can be met with trepidation or flat-out opposition by some. These skeptics are understandably fearful of uniformity in the academy simply for accountability's sake and even a diminishing of the value of professorial judgment. While such steps would certainly go too far, establishing a shared, institutional base value of what is expected of students would benefit higher education twofold. As Richard Hersh has noted, when discussing his "value-added" theory for higher education, strong assessment "first and foremost helps to improve student-learning and institutional efficacy and second, provides appropriate student learning evidence in response to calls for accountability."

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Hersh's theory measures knowledge gained by students while at an institution, and involves assessment of learners at the start, during, and after college. He extols the virtues and necessity of data collection and transparency when evaluating college student outcomes — and institutions have begun to listen. At Alverno College in Wisconsin, students build a Diagnostic Digital Portfolio (DDP) based on the school's "assessment-as-learning process." The DDP is a web-based database of assessments and assignments that allows learning to become transparent not only to students, but also to potential future employers or graduate schools. In a 2006 report from the Education Schools Project, Alverno was one of only four institutions in the nation noted for contributing to a measurable difference in student outcomes. A glance at Alverno's student population refutes any notion that New England's demographic shift might be an impediment to improving postsecondary achievement for a majority of learners: 35 percent of students are part-time; 71 percent of students are the first in their family to go to college; and 88 percent of all students at Alverno receive financial aid.

Some schools promote themselves based on their new measures of performance. The University of Nebraska at Omaha recently began marketing itself as "First in Value-Added Education" due to its impressive scores on the 2007-08 Collegiate Learning Assessment, the Council for Aid to Education's performance-based examination. In New England, Southern Connecticut State University uses a portfolio program similar to Alverno's for students pursuing a Master of Library Science degree. At the University of Massachusetts Boston, the College of Community and Public Service is designed around a competency-based curriculum, allowing students to learn in a variety of ways in and out of the classroom.

Far from becoming a one-size-fits-all means of accountability for higher education, the expanded acceptance and application of multiple assessments could ultimately help connect higher education with high schools — promoting creative, performance-based ways of bridging what is now a treacherous chasm between systems for so many learners. Currently, the important and necessary work behind "college readiness" and K-16 movements is driven primarily by student outcomes as defined by higher education. That conversation needs to become more collaborative in purpose, and the use of multiple, high quality assessments at both ends would help create the system we should be striving toward — one that is reasonably aligned, flexible and focused on meaningful outcomes.

The work ahead is no longer only about improving high school or ensuring the affordability of postsecondary education. The core challenge is to provide learners with high quality opportunities for postsecondary success. In order to produce the well-rounded citizens New England needs, we will first need rigorous, valid assessments that reveal what learners know in a variety of ways. Institutionalizing and implementing this effort is a test we can and must pass.

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Down Under, Higher Education Drives Economic Development

What we can learn from Australian models of the engaged university

LINDA SILKA

Every region has its visionaries: thinkers whose insights draw attention to issues that require consideration. Many see the novelist Richard Russo as playing this role in contemporary New England. In Russo's books "the Northeast is seen as a decaying behemoth whose old industrial infrastructure has outlived its power to convey prosperity," said a reviewer in *The New York Times Book Review* last year. Once the center of American industry, New England has hit upon hard times, and Russo's books vividly capture this downward trajectory and the ongoing struggle to find means of regaining prosperity. As a region, we are increasingly aware of our need to find new economic strengths. The many candidates for these new economic engines include "knowledge economy" industries such as biotechnology and nanotechnology. New England higher education is expected to play a central role in creating these new routes. But how?

I recently spent five weeks in Australia working with universities on a broad range of engagement practices. Queensland University of Technology (QUT) exemplifies the engagement work at the forefront of Australia's efforts to move its universities into a central role in addressing the global economy. QUT not only has devoted much discussion to how a university might stimulate the creative economy (or, as they call it, "creative industry"), but has also put many of the ideas into practice. Kelvin Grove Urban Village is one result (*kgurbanvillage.com.au*). This award-winning redesign in Brisbane is not just bricks and mortar, nor is it simply programs. It is both. Small businesses in the creative industry have been established and linked to university programs. QUT moved its health programs and biotechnology research initiatives to Kelvin Grove. Faltering elder housing has been redesigned. The university's engagement with the city of Brisbane and the state of Queensland has been central to the success of these efforts. Many such initiatives are now emerging across Australia.

In New England, engagement partnerships like those at Australia's QUT are becoming more common as universities look to address the global economy. In our region, we have gone from a few stellar exemplars of universities working on engagement (notably Clark University and Trinity College) to many other institutions bringing their unique blend of intellectual resources to bear on longstanding problems. Indeed, one need not look far in New England to see the emergence of innovative approaches to engagement. Such efforts can be seen at public universities (University of Maine) and private college, (Bates), at research universities (Massachusetts Institute of Technology) and community colleges (Middlesex in Massachusetts.).

As New England institutions of higher education become involved in engagement—and as they struggle with how to engage without losing academic focus—what might be learned from the far-flung Australian universities? Sometimes the most instructive comparisons are those that by their unfamiliarity help us imagine new possibilities. We may be able to think about our New England challenges in fresh ways by examining Australian forays into engagement.

The purpose of my Australia trip as a Visiting Scholar to the Australian Universities Community Engagement Alliance (AUCEA) was ostensibly to share American engagement practices, but in fact the Australians introduced me to examples that we can apply in New England. My travels took me from Perth, on Australia's west coast; to Alice Springs, in Australia's "red center;" to the eastern mega-cities of Brisbane, Melbourne and Sydney. The similarities between Australia and New England were striking, making knowledge of their practices all the more useful. Although Australia has vast tracts of sparsely populated land and some universities maintain a rural focus, most people live in the densely populated eastern seaboard; universities are situated in the midst of familiar urban problems. The similarities between Australia and New England include common economic problems: the industrial base of Australia's economy is eroding, resulting in the loss of high-paying manufacturing jobs.

At the individual campuses, I saw firsthand many examples of innovative engagement in economic development; many were also showcased at the 2007 AUCEA National Conference on "The Scholarship of Community Engagement: Australia's Way Forward." Wollongong, the former industrial city on Australia's east coast, for example, has seen its manufacturing

base eroded; University of Wollongong leaders outlined the steps they have taken to create an Innovation Campus to jumpstart the faltering economy (*www.innovationcampus.com.au*). Leaders at Edith Cowan University highlighted their Centre for Research in Entertainment, Arts, Technology, Education, and Community (CREATEC; *createc.ea.ecu.edu.au*). During conference sessions in Alice Springs, attendees had opportunities to visit

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the Desert Knowledge Cooperative Research Centre, where faculty link with partners to create commercial research applications for desert communities (*www.desertknowledgecrc.com.au*).

The disciplines at the forefront of engagement were not always the expected ones. At Edith Cowan, for instance, the art department is working with Aboriginal painters whose health is increasingly threatened by toxic paints.

What kind of infrastructure is needed to support these efforts? Some Australian universities are at the forefront of modeling engagement infrastructure; the University of Western Sydney (UWS) is such a leader. In addition to a fully staffed engagement office, UWS has three deans whose efforts are devoted to engagement. Leading all of this work is the scholar Barbara Holland whose title at UWS is Pro Vice Chancellor for Engagement. A major reason that engagement is able to attract these resources is that it is increasingly regarded not as separate from UWS's academic focus, but as a "way of carrying out research, teaching, learning and service — the core business of the University" (*www.uws.edu.au*).

As these examples suggest, there is much to be learned from Australia's pioneering efforts. Doing so may improve the prospects for similar place-based efforts here in New England. Consider, as one example, the case of Maine's Environmental Solutions Initiative (*www.umaine.edu/waterresearch*). The Maine effort draws its impetus from a Brookings Institution report, *Charting Maine's Future*, which outlines the difficulties Maine faces in the global economy. In Maine, environmental concerns are pronounced, and this report makes the case for alternative development scenarios for Maine's changing landscape. David Hart, director of the University of Maine's George Mitchell Center, has noted that the flagship Orono campus of the Maine system has the intellectual resources to respond to these challenges, given that nearly a quarter of the faculty do research linked to environmental issues. But attempts to mobilize the faculty face obstacles: individual faculty are sometimes unfamiliar with one another's work, they lack experience working with outside partners, and they cannot always see how their expertise can be combined with that of other faculty.

The task before the Center is how best to facilitate a process by which faculty can be brought together with community partners to arrive at meaningful environmental solutions for Maine. Such a process could provide examples to be used by other campuses around New England, or even possibly worldwide.

Initiatives of this sort, much like those being tested in Australia, have the potential to create practices that engage with regional economic problems. Such initiatives, David Hart has noted, could be a way to overcome the problem of research going unused—what has been called the "loading dock" problem. In this analogy, the production of university research, when carried out in an isolated, unengaged fashion, is not unlike assembly lines in which products are created and moved to a loading dock with the hope that someone outside the plant will use them. But as U.S. researchers Cash, Borck, and Patt point out in their 2006 study, "Countering the Loading-Dock Approach to Linking Science and Decision Making," (*Science, Technology, and Human Values)*, what is produced may not be what is needed, and it may be produced faster than the market can absorb. As a result, unused products stack up on the loading dock: researchers produce their research but the results are never used. Again, could we benefit from considering

The similarities between Australia and New England include common economic problems: the industrial base of Australia's economy is eroding, resulting in the loss of high-paying manufacturing jobs.

how Australian models confront the difficulties of engagement? These emerging Australian models point to the value of partnerships in which researchers work with partners early in the knowledge-production cycle to identify those research questions of greatest interest.

In the final analysis, however, efforts to encourage the devotion of scarce resources to engagement will be short-lived if universities go unrewarded for activities that extend beyond traditional teaching and research. When these Australian ideas are considered together with the new Carnegie Indicators of Engagement emerging in the United States, the possibility becomes real that the face of higher education in New England will change and that the engaged university, one that makes a difference in regional economic development, could become the norm rather than the exception.

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Sustainability and Higher Education

For future generations to thrive in this world, education must lead the way — by teaching, and by example

DAVID HALES

By the end of this century, we will live either in a world that is sustainable, peaceful and just, or in a world that is unstable, violent and insecure. We have the opportunity to make the choice, and thus we have the responsibility to do so wisely and well.

The 21st century will be characterized by massive and rapid change — a time of great danger and great opportunity.

Institutions of higher education will be the crucibles in which both individual and societal responses to this challenge are shaped.

The challenge we face is epic in nature, but so is the opportunity, and so, as educators, we have an unprecedented responsibility.

In the past 50 years, a number of factors have interacted to create an exponential increase in the pace and magnitude of change that threatens the sustainability of societies. One-half of Earth's land surface is now dedicated to the service of humans. We appropriate 40 percent of nature's net photosynthetic productivity. We are the primary users of half of the available fresh water in the world. We no longer affect just weather; we affect climate as well. No major natural system of this planet remains untouched by human activity. In short, we are the first generation of humans to become a force of geological proportions.

As we weaken the planet's natural systems, we increase our demands on them, and upon our social and political systems. More than 6 billion people, each one of whom needs 1,400 calories and four pounds of water a day to survive, now share this planet. Of the 180 people born each minute, 120 will be born in a city, 160 in a developing country. Of those who live to adulthood, one of three will be uneducated, and there are already more people living today who cannot read or write than there were people living in the world in 1900.

One-half of the people in the world live on less than $2 (U.S.) a day, and the assets of the richest 200 people exceed the combined wealth of the poorest 40 percent of the world's population. Of these 2.5 billion people, 70 percent are women and children. More than 2 billion people go to bed hungry each night.

We face four fundamental dilemmas, which are essentially moral choices:

- alleviating poverty;
- removing the gap between rich and poor;
- controlling the use of violence for political ends; and
- changing our patterns of production and consumption and achieving the transition to sustainability.

The world in which future generations live will depend on how we respond to each of these challenges, yet we are philosophically and institutionally unprepared for the decisions we must make and implement.

The institutions available to us to meet these challenges are demonstrably incapable of long-range planning, dominated by peculiar and special interests, fragmented in authority and responsibility, and designed to allocate abundance, not scarcity. The performance of these institutions in terms of human and ecosystem well-being, has not been encouraging.

If we are to hope that business as usual will lead us to a sustainable world, we must believe that the same institutions and processes, that have led us to this point in human history, can lead us somewhere else in the future. Moreover, we must argue that substantial inequities in distribution of political power and material wealth are either inevitable or just.

On the other hand, to abandon our dominant institutions and attack the status quo indiscriminately would have tremendous implications for natural systems and human well-being as well. Neither slavish adherence to the arrangements of the past nor unthinking rejection of them will guide us through the transition to a world that is sustainable and just. We must reject neither our history nor our future.

Education for Sustainability

Institutions of education are essential to actively challenging the forces that threaten both human and natural system well-being. We must seriously postulate the existence of discontinuity between our values and our institutions. It is in the academy of practitioners and scholars that we will debate and clarify our basic values and develop an understanding that institutions are only the vehicles for those values. If we hold firm to the values, the institutions will respond. If we hold rigorously to the institutions, our values will deteriorate. The purposeful, conscious and active evolution of our values and institutions must begin with higher education. No other societal institution can play this role. Education is the force that will enlighten, enable and empower our choices.

There are competing etymologies for the English verb "educate," but the one I prefer considers the word itself to be based on the Latin word ducos, to lead, and the prefix *e* — out or out of. In the ancient foundation of the very word is the challenge of our

future. Higher education must move beyond the responsibility to prepare students to live in the world as it will be — we must embrace the responsibility to prepare students to shape the world in which they will live.

How Must We Respond?

We must look carefully at how we organize and present knowledge.

We must realize that our institutions reflect our values in ways that are just as influential on our students as the lessons in our classrooms.

We must acknowledge and assert our values and our purpose.

We must develop and embody an ethic for the 21st century — an ethic that holds that the opportunity to make a difference is equal to the responsibility to make a difference.

At College of the Atlantic, we study the relationships among humans and the natural world. The province of "human ecology" is no more — and no less — than that. We focus on the interaction of four "worlds" — the natural world, the social and cultural world of humans, the virtual world that permeates our lives, and the world of the imagination. Our commitment to teaching and to a pedagogy of high-value, personal interaction is magnified by our singular focus on human ecology. We believe that the relationships among humans and between humans and the environment can be made more sustainable, more peaceful and more just. We believe that humans are firmly and inextricably embedded in the natural world, and that each person can make a difference.

It is no accident that problems with clean air, clean water, toxic pollution, genetically-modified organisms, extermination of species, nuclear waste, overpopulation, desertification, deforestation and global warming have emerged in the same incredibly brief moment in human history. Nor is it an accident that human ecology has emerged as a new academic focus in this same period. The historic role of education has been to provide society with the capacity to understand, anticipate and respond to the needs of society. The responsibility of education is no longer just to help understand the world in which we will live, but also to shape the world in which we want to live.

We have also committed ourselves to practicing what we teach.

All college ceremonies and special events at College of the Atlantic — commencement, convocation, parent's weekends, Earth Day — are "zero waste." We are reducing our energy consumption with a wide variety of efficiency and conservation measures, and all of our electricity comes from renewable sources. In December 2006, we achieved Net Zero in greenhouse-gas emissions, through a combination of avoidance, conservation, and offsets. We have committed ourselves, by 2015, to 100 percent reliance on renewables, including transportation and heating. The food we serve on campus is organic and locally grown for the most part, and much of it is produced on our own organic farm, managed and operated by current and former students. We neither purchase nor sell bottled water. We purchase only Energy Star appliances. Almost all the materials we use are recycled — from paper products and furnishings to the shingles for the roofs of our buildings. The paints we use contain no volatile organic compounds.

We have taken these steps not only because we believe them to be the right thing to do, but also because they are the smart things to do. Just as importantly, we have taken each of these steps as a community in which students, staff, faculty and trustees share the commitment and participate in the implementation.

In our curriculum and our co-curriculum, we emphasize that all actions are the embodiment of choices, that all actions have consequences, and that it is the responsibility of an educated person to understand those relationships and to learn from each mistake.

A Time of Moral Choice

We are the first generation to have the realistic possibility of achieving a just and sustainable society. We have the skills and knowledge, the technology, and clear evidence of the penalty we will pay and impose on our children, if we are not successful. No one of imagination and insight can sincerely assert that business as usual at the end of the 20th century can produce a world in which we want our children and grandchildren to live at the end of the 21st century. What remains to be seen is whether we have the will and courage to do that which we know is necessary.

The task before us is difficult, yet necessary; no other societal institution can play this role. Education is the force that will enlighten, enable and empower our choices.

Our actions will write the future across the face of this planet. It is in our power to choose the future. This is both the lesson and the legacy of the marvelous world in which we live, of the systems and the processes that we call nature. The individual is both acting and acted upon. Our actions are choices, and we, as individuals, and as institutions of higher education, can make a difference.

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Environmentally Conscious Campus Development

It can be win-win-win — for campus, community and cost control — when there is environmental planning

LAWRENCE C. BACHER

Colleges and universities have widely responded to the expectation that we should work toward, operate under, and live by principles of sustainability. Eighty-nine of the 260-plus institutions of higher learning in New England (34 percent) have signed the *American College & University Presidents Climate Commitment* to guide their institutions and their programs toward climate neutrality. Public institutions have been significant leaders, with more than half of New England's public colleges and universities (57 percent) participating.

Interest in sustainable development comes from many sources, but first and foremost, from the interest of students, faculty, administration and the wider community in moderating or reversing climate change. A recent survey of college presidents and executive officers identified the following reasons for developing environmental programs on campus. They fit in with the culture and values of the campus; they are good public relations; they are cost-effective, and they help recruit students.

Given that buildings consume 40 percent of all U.S. energy, construction is a major focus of improvement. On a typical campus, up to 90 percent of direct greenhouse-gas emissions come from buildings. While interest in sustainable development is strong, justifying expenditures for sustainable development in a difficult economic environment can be challenging. Nevertheless, there is a strong economic and community-relations rationale for pursuing sustainable goals.

Defining Sustainability

While a variety of guidelines focus efforts on sustainable operations and development, the most referenced is the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. According to a recent survey, 44 percent of New England projects achieving LEED certification were built for colleges and universities, and more than half of those (57 percent) were for public institutions.

While many institutions follow other guideline systems or their own definition of "sustainability," the *Presidents Climate Commitment* and LEED are commonly recognized as rigorous systems of evaluation requiring a committed effort. New England's public colleges and universities are clearly leaders in this pursuit.

On a typical campus, up to 90 percent of direct greenhouse-gas emissions come from buildings.

Public institutions in Connecticut, Maine, Massachusetts and Rhode Island, are required by state law or executive orders to meet LEED standards in major construction projects. While not all New England public institutions are bound by this requirement, New England communities in the table below have adopted ordinances or bylaws mandating or encouraging LEED certification. In addition, the New England universities listed have explicitly adopted policies guiding their institutions toward LEED certification.

Institutional Cost Saving

One of the most pragmatic goals for campuses to pursue is to reduce energy costs. Energy conservation measures have a direct, measurable impact on reducing campus operating costs, while reducing the campus carbon footprint. Energy reductions reduce carbon footprint, whether the energy comes from on-campus sources such as co-generation systems, or is purchased from a utility. Both have carbon emissions to avoid.

Many basic energy conservation measures do not involve mechanical systems and cost almost nothing. The way buildings are sited to respond to microclimate — wind, shelter and solar orientation — can have significant impact on long-term energy demand.

"Leeding" Communities and Colleges

Communities Adopting LEED	Colleges & Universities Adopting LEED
Acton, Mass.	Bowdoin College
Arlington, Mass.	Brown University
Bangor, Maine	Connecticut College
Bar Harbor, Maine	Dartmouth College
Berlin, Conn.	Harvard University
Boston, Mass.	Massachusetts Institute of Technology
Mansfield, Conn.	University of Connecticut
Portsmouth, N.H.	University of Vermont

LEED Initiatives in Governments and Schools, U.S. Green Building Council, July 2008.

Careful massing of buildings can employ seasonal microclimate variations to provide a part of energy needs by:

- admitting daylight as widely as possible, to reduce the need for artificial illumination;
- encouraging absorption of solar heat during cool heating months; and
- shielding the building from solar radiation during warm cooling months.

Massing strategies include careful placement of windows, shielding of openings through window depth or overhangs and strategic landscape plantings. A skilled architect can incorporate these strategies while developing a sensitive design.

In all New England states, building codes require design professionals to develop building envelope designs to meet minimum energy efficiency standards; skilled application of these principles can result in long-term payback at minimal additional cost. A white roof, for example, reflects solar heat that would be absorbed by a black roof. Significant savings result from nothing but the color. A reflective film on window glass has a similar effect. Other options, such as increased insulation and insulating window glass, add some initial cost, but return that cost quickly through energy savings.

Careful consideration of program needs can also provide energy savings. When the University of Rhode Island realized that a large atrium in a new center for biotechnology and life sciences would be used only briefly (by people walking to other spaces in the building) and that two floors of teaching labs would not be used in summer months, these spaces were built with provisions for automated natural ventilation, not air conditioning. These measures reduced long-term energy costs and reduced up-front capital costs, since major building energy systems — chillers, pumps and switchgear — could be downsized on the assumption of reduced loads.

The most common energy system improvement is upgrading the efficiency of lighting systems. Changing light bulbs to compact fluorescents in existing fixtures is inexpensive and cost-effective. Major mechanical equipment — fans, pumps, boilers and chillers — can be bought in energy-conserving models, at a small premium. All New England states have utility and state-funded programs to subsidize and support the cost of such improvements.

As a campus develops over decades, it acquires a panoply of building control systems. Contemporary control systems stop and start equipment when needed, monitor space conditions and occupancies with accuracy, and implement sophisticated strategies to reduce overall energy use. A professional evaluation of building controls can identify places where controls can be upgraded to harmonize systems and return energy savings — while reducing carbon footprint.

Community Cost Saving

A range of sustainable measures can benefit the community surrounding the institution through avoided infrastructure costs. Storm water mitigation is a clear example of this. The sustainable principle is that rainfall should be retained on site, rather than sent out to community storm-water systems or local wetlands. Storm water places demands on community infrastructure that may impel construction of new storm drain systems. Storm water sent to wetlands can overwhelm and damage fragile ecosystems.

Water-retention systems — retention ponds — enable a new building project to avoid creating off-site storm-water runoff. In an academic environment, these features can be upgraded to create wetland habitat and even become teaching opportunities. They do take

space on campus, however. A measure that takes no space and may cost no more than conventional methods, is to use permeable pavement — asphalt, concrete or stone, produced with voids that let rainwater and melted snow percolate through to the groundwater. The University of Massachusetts, as a part of its integrated sciences building at Amherst, incorporated an underground 20,000 gallon storage tank that collects water from roofs and the underground foundation drainage system. Rather than discharging this water to storm sewers, the building uses it at cooling towers to supplement water lost to evaporation. For the cost of a tank and a pump, the university has reduced long-term water supply cost and the potential strain on campus storm water systems. Other projects have used similar "grey water" systems for other water needs that do not require treated potable water — such as flushing toilets, or lawn irrigation.

One measure that can cost the same as conventional systems but reduce water needs is the use of waterless urinals. Maintenance procedures are similar, but can take less time than maintenance of standard urinals. Another method, called xeriscaping, is a landscaping technique using native plants, reduced or no turf, and careful planning to minimize landscape water usage. Maintenance costs are also reduced, as lawn areas are costly items in groundskeeping budgets.

Campuses working toward carbon footprint reduction must also focus on vehicle traffic. Students, faculty, administration and visitors traveling by car to and from campus create significant emissions and energy use. The expansion of on-campus housing options in recent years addresses traffic directly. On-campus housing also benefits student life and can address town/gown relationship issues.

Master plan development can have significant impact on use of automobiles on campus. Cars are a major component of campus carbon footprint. Many university campuses have been developed for the convenience of cars. They offer broad roadways and dispersed parking lots that make access by auto convenient to university buildings. They also spread buildings apart and introduce traffic between them, making access by pedestrians inconvenient or dangerous. Such campuses promote use of autos to navigate between classes and meetings. Forward-looking campuses are developing pedestrian-friendly centers, with greens, walkways and courtyards between buildings. Parking facilities are relocated to the perimeter. This keeps traffic out of campus; promotes development of larger, more cost-effective parking facilities; reduces pollution from emissions; and encourages healthy walking activity. A campus shuttle system facilitates leaving the car behind for the day. If the shuttle reaches out to public transportation points-of-contact, even more car reduction is accomplished.

The more public transportation routes that serve a campus, the less need there is for autos and parking facilities. One effective strategy is to partner with local communities to develop transportation alternatives; it may even be economical to subsidize community efforts, in lieu of investment in car accommodations on campus.

There are many other measures, and many other goals encompassed in sustainable development. As a starting point for conversation, the benefits to campus and community are resonant.

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The Role of Sustainability in Campus Planning

A New England university builds on the land grant tradition

GREG HAVENS, PERRY CHAPMAN AND BRYAN IRWIN

The Morrill Act of 1862, signed by Abraham Lincoln, established the land grant university with a Solomon-like simplicity: the federal government would deed large tracts of land to establish public colleges in each state. These institutions would then train young citizens in agriculture, forestry, mining and the mechanical arts — fields tied directly to the prosperity of the nation at the time. Land grant universities today are emerging as leaders in the sustainability movement. They have deep historic ties to stewardship of land and water resources; their faculties — specializing in innumerable fields now thought of as environmental — make them living laboratories for the latest thinking in green design and planning.

Nowhere in New England is this trend more evident than at the University of Maine, which straddles the towns of Orono and Old Town. As both the state's land-grant and sea-grant university, the main campus is augmented by satellite campuses in the state's heavily wooded and sparsely inhabited north, as well as its more populated southern coastal area.

UMaine embodies — geographically, culturally and demographically — the state's growing reputation as a national leader in green thinking and innovation. Maine's splendid coast, known largely as a vacation haunt of Astors and Rockefellers in an earlier time, is now a destination for Americans and Canadians of all economic means. Increasingly, educational and political leaders in the state are seeking ways to leverage its proximity to Canada — Orono forms part of an equilateral triangle between Boston and Quebec City — and the state's industries stand to benefit as U.S. and Canadian trade increases. Not coincidentally, the location is also part of the university's plans to broaden its draw of U.S. and international applicants.

When most people think of green campus design, they envision buildings with solar panels or turbines harnessing hydroelectric power. But even more substantial sustainability advances can be made at the planning level.

While charting the University of Maine's growth over the next quarter century in a formal master plan, extraordinary sustainability opportunities and challenges were uncovered, due both to physical and institutional conditions:

- University President Robert A. Kennedy has signed the American College and University President's Climate Commitment, which is both an impetus and a challenge — how can the institution fulfill its pledge while also implementing a growth strategy and increasing its research presence?

- The university's own Climate Change Institute (CCI) is right in the thick of the worldwide discussion about global warming. The interdisciplinary research unit focuses on the variability of the Earth's climate, with a special attention to the Quaternary Period, a time of numerous glacial/interglacial cycles. In addition, more than two dozen UMaine academics, within and outside the CCI, are engaged in research related to alternative energy and the physical, biological, chemical, social, and economic effects of climate change.

- The College of Engineering is advancing composite research in technologies and alternative energy production.

- The presence of the extensive forested land, including Demerritt forest and the forest preserve, part of the land grant legacy, offers multiple opportunities to test how such property can be managed, expanded and preserved.

- A rich legacy of campus landscape design by Frederick Law Olmsted, Sr. and his firm is matched by a unique architectural patrimony, including several buildings on the National Register of Historic Places. The challenge for planners was to celebrate this rich tradition while designing spaces that could accommodate 21st century growth.

A central idea of the master plan was that it had to respond to urgent environmental imperatives using a four-pronged approach: demand management to encourage efficiency and energy conservation; renewable energy supply strategies; resource management; and alternative transportation.

To these ends, key decisions were made early on at the planning level, including a campus growth boundary; extension of the Olmsted-designed university mall to the south, framed by new buildings oriented in response to the sun and arrayed along a landscaped promenade featuring wind breaks; and a new transportation network favoring human-powered movement within a pedestrian system that enhances connections between buildings and links the entire campus to surrounding forests and riverfronts.

This is an idea that has gained currency in the larger urban planning field — setting a perimeter beyond which major building will not occur. The boundary places a moratorium on new roads and development in the Demerritt forest, with the exception of research-related projects. The idea rests on the principle, supported by a large body of urban evidence, that density is a good thing. A compact land-use pattern has been shown to reinforce the pedestrian qualities of a district, maintain operational and infrastructure efficiencies, prevent encroachment into surrounding natural systems, and enhance human vitality and interaction by placing a variety of activities in close proximity to one another.

The Olmsted-designed university mall is an elegant building arrangement that echoes the formal Beaux-Arts

planning principles commonly applied in the early 20th century. The challenge was to celebrate and preserve this history by echoing this design vocabulary south of the library, cast in such a way as to consider building placement as a means of mitigating winds and maximizing solar exposure during the long Maine winters. Thus the new mall is a 21st century iteration of the original. Since wind breaks and solar orientation were not given primary consideration in the original Olmsted design, the orientation of major buildings was flipped 90 degrees; together these buildings shelter pedestrians from northern winds that sweep onto the site from October through April. Furthermore, this solar orientation means substantial heat gain in winter.

The proposed forest connections create an expanded trail network and increased recreational access to the forests — an amenity enjoyed by students, faculty and the Orono and Old Town communities. Like many inland Maine towns, the history of Orono and Old Town are closely tied to their riverfronts. As a means of recapturing this important link, the master plan re-establishes Olmsted's riverfront parade ground and reintroduces vegetation along the riverfront in conjunction with a new trail commemorating the Wabanake tribe, the pre-Columbian settlers of this region of Maine.

The master plan specifies that many of the new buildings have entrances that are aligned for easy movement from building to building. Corridors are located along building perimeters so that pedestrians can "cross-through" multiple structures as they make their way across campus during winter.

Virtually every major decision in the master plan is informed by the imperative of preserving water resources and lowering energy costs and emissions. The majority of new buildings are located on sites currently used as surface parking. Concentrating development in the core campus also maintains fields and forests as buffers that offer natural control of storm water run off and quality. The university is improving the efficiency of its physical plant and miles of underground infrastructure, transitioning much of its power needs to cleaner fuels, and ultimately transitioning to renewable energy sources. The institutional goal is to reduce CO2 emissions from a current peak of 70,000 metric tons annually to 14,000 metric tons annually by 2050.

New Englander Justin Smith Morrill, after whom the Morrill Land Grant Act is named, was a visionary about agriculture and higher education's duty to preserve and advance practical knowledge. After Morrill's time, the United States would go on to become the world leader in agriculture. The University of Maine seeks to set an example of how, by tapping into the land grant legacy and other educational traditions, the nation might assume a leadership position in the environment as well.

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Green Tuition Breaks

In response to growing concern about environmental issues and to prepare graduates for an expanding "lean and green" economy, Keene State College will offer a bachelor's degree program in sustainable product design and innovation in fall 2009. The program will include hands-on, project-based learning that focuses on real-world applications, with an emphasis on innovation and business management.

Because the state colleges and universities in Connecticut, Maine, Massachusetts and Rhode Island do not offer a comparable program, residents of those states are eligible to enroll at reduced tuition through the New England Board of Higher Education's Tuition Break — the Regional Student Program. This longest running NEBHE program has been helping New England residents pursue and afford their chosen field of study at out-of-state New England public colleges and universities — when that major is not offered by their in-state public colleges.

Among other opportunities for tuition breaks in sustainability programs in New England:

Lyndon State College recently launched an interdisciplinary bachelor's degree program in sustainability studies, which will be available this fall under the Tuition Break to residents of Connecticut, Massachusetts, New Hampshire and Rhode Island.

Vermont Technical College offers a "+2" bachelor's degree program in sustainable design and technology, with tracks in green energy, green buildings or green sites. Residents of Maine, Massachusetts, New Hampshire and Rhode Island, who have earned an associate degree in a technical area, are eligible for the program under Tuition Break this fall.

The **University of Maine** has offered its sustainable agriculture bachelor's degree program since 1988, when it was the first such undergraduate program in the United States. The program continues to be relatively unique in New England. Residents in Connecticut, Massachusetts, New Hampshire and Rhode Island are eligible to take the program at UMaine under Tuition Break. The bachelor's degree program prepares students for employment in the expanding arena of organic and locally grown produce. Students gain field experience working for a local food guild, organic seed companies, and organic farms or as research field assistants.

Based on a regional agreement to share programs not offered by every New England state, the Tuition Break program currently affords students an average $7,000 savings on their annual tuition bills.

Green Campuses, Green Programs

AMANDA SILVIA

Some recent "green" news from colleges and universities across New England:

The **University of New Hampshire** is distributing free compact fluorescent light bulbs (CFLs) to all students living in residence halls on campus. More than 1,700 energy-saving, 13-watt CFLs—which are equivalent to 60-watt incandescent bulbs—will be distributed. In addition, UNH purchased one thousand CFLs for built-in fixtures in residence halls. It is estimated that the bulbs will save the university $17,250 in energy costs, and the school's greenhouse-gas reduction will be the equivalent of not driving 11.3 passenger cars for one year.

Saint Joseph's College of Maine will build a center for the study of environmental sciences that will open in fall 2009. The building will be LEED-certified, a national benchmark for the design, construction and operation of high-performance green buildings.

St. Joseph College in West Hartford, Conn., was awarded $481,000 from the U.S. Department of Energy to serve as a demonstration site for the use of alternative energy sources. The college will install a solar thermal system on the roof of its O'Connell Athletic Center to heat domestic water for the building, including its six-lane, 25-yard swimming pool in the Bruyette Natatorium.

Eastern Connecticut State University is opening a new science building, which includes a 150-seat lecture hall with state-of-the-art visual systems, a computer science suite, greenhouse and dedicated science library. Included in the building are day-lighting controls in all classrooms and offices, a glass-encased atrium, a "grey-water" system, chilled beams for cooling office space, variable-speed drives on lab hoods, recycled steel beams, indoor air-quality monitoring equipment and recycled/renewable content in the carpeting, flooring and casework.

Worcester Polytechnic Institute in Massachusetts launched an environmental studies bachelor's program designed to provide students with intensive technological and social policy training and geared toward solving complex environmental problems and educating future environmental professionals.

Two separate million-dollar gifts will help the **University of Massachusetts Lowell** advance the study of environmentally friendly plastics through teaching, research and laboratory experiences. Each gift includes a $500,000 match from a $20 million state trust fund that supports the creation of endowments related to the environment.

Colby College in Maine received a $4 million donation from the Diamond Family Foundation to support interdisciplinary study of the environment, energy policy, climate change and sustainability.

Through a $1.5 million U.S. Department of Energy grant secured by the Association of Vermont Independent Colleges and supported by U.S. Rep. Peter Welch (Vt.-D) and U.S. Sen. Patrick Leahy (Vt.-D), seven independent Vermont institutions—the **College of St. Joseph** and **Burlington**, **Green Mountain**, **Goddard**, **Marlboro**, **Sterling** and **Woodbury** colleges—will have the opportunity to improve energy efficiency on their campuses and educate their students on the importance of reducing carbon emissions. The schools will have three to five years to use the money as they wish, although they must match 50 percent of the grant money. Some will perform energy audits, improve efficiency of old buildings and design new projects, while others plan to explore the possibility of implementing new technologies such as installing solar panels or harnessing wind power.

Bowdoin College in Maine has reached a three-year agreement to purchase renewable energy certificates from a utility-sized wind farm run by First Wind, formerly named UPC Wind. Bowdoin is offsetting approximately 70 percent of its campus electricity use with voluntary renewable energy certificates produced in Maine; 31 percent of its competitive electric supply is from renewable sources.

Babson College in Massachusetts, plans to install a residential-scale wind turbine on the school's campus as a demonstration project, becoming the first college in the Greater Boston area to utilize wind power through an on-campus installation. It is estimated that the turbine will produce enough energy to supply 60 percent of the annual energy needs at the school's entrepreneurship gallery after planned lighting renovations are completed within the space.

Colleges and universities throughout the nation are stepping up their environmental accountability. All 50 states are represented in the American College & University Presidents Climate Commitment, a "high-visibility effort to address global warming by garnering institutional commitments to neutralize greenhouse-gas emissions and accelerate the research and educational efforts of higher education to equip society to re-stabilize Earth's climate." Nearly 90 presidents of New England institutions have already signed the pledge.

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Eco-Friendly Campuses As Teaching Tools

STEPHEN J. ERWIN AND THOMAS D. KEARNS

Sustainable design projects offer academic communities the opportunity to make the design and operations of their campuses part of the larger lessons of social and environmental responsibility that are integral parts of higher education. In no place is that demonstrated more clearly than in New England, with its long commitment to environmental stewardship.

A design process that engages the campus and the broader community gives students the opportunity to participate in community dialogue and a collaborative planning and design process. When Bates College encountered strong community opposition to a development at the base of Mount David in Lewiston, Maine, it framed the design process as a forum for dialogue where concerns and solutions could be discussed openly and resolved collectively. This approach transformed a process from one that could have been adversarial to one that was collaborative.

Increasingly, college campuses are seeking ways to ensure that the campus itself and the buildings in which students live and learn reinforce the institution's commitment to sustainable design, operation and education. From a depth of more than 1,500 feet beneath its campus, the geothermal wells at Colby College in Waterville, Maine, provide a rich source of data on the dynamics of geothermal systems. The college has, in effect, created its own case study regarding these systems, as it seeks solutions to such challenges as the operation of geothermal systems during power failures and the management of excess water generated by the process. With Colby's campus serving as a living lab, the solutions developed here will have a wider impact and establish the college as a leader in environmentally sustainable design.

Education about sustainable practices is not limited to the classroom, as the new residential village at Bates demonstrates. The complex reflects the emphasis on sustainability in the college's 2003 facilities master plan.

Lights dim in response to the amount of natural light and use motion detectors to switch off when the space is unused. A plaque in the complex's common space provides residents with information on how to be more environmentally engaged, including tips on diverting recyclables from the waste stream and reducing energy consumption. By strategically locating recycling bins, institutions make recycling a convenient and responsible alternative to throwing things away.

How Green Are U?

The Princeton Review cites New England institutions on sustainability

For this year's annual publication of college rankings, *The Princeton Review* introduced a "Green Rating" that evaluates colleges and universities on their environmental policies, practices and academic offerings. It also evaluates whether students have a healthy and sustainable quality of life, how well a school is preparing students for a world defined by environmental concerns and opportunities, and how often the school implements environmentally responsible policies.

Bates College, College of the Atlantic, Harvard College, the University of New Hampshire and Yale University received perfect scores.

Some specifics:

Bates opened two new buildings with LEED-silver equivalence and became the first Maine school to partner with ZipCar to bring two Toyota Priuses to campus. Bates also retains 28 percent of its food budget for local, natural and organic purchases.

College of the Atlantic is now net-zero for carbon emissions. All electricity on campus comes from renewable hydropower, many buildings are heated with renewable wood pellets and new dorms have composting toilets, triple-paned windows and metered showers.

Harvard has the largest green campus organization in the world, consisting of 24 full-time professional staff and 32 part-time student employees. Harvard has committed to a 30 percent reduction of greenhouse-gas emissions (below its 2006 levels) by 2016 and established a $12 million revolving fund to provide interest-free loans to those in the community with a green campus project.

In January 2009, the **University of New Hampshire** will become the first university in the United States to use landfill gas as its primary energy source, reducing greenhouse-gas emissions an estimated 75 percent below 1990 levels. The campus also includes an organic dairy farm and education/research center.

Yale University is committed to reducing its greenhouse-gas emissions by 43 percent below 1990 levels and has achieved a 17 percent reduction in the first two years of its effort. Yale uses solar, wind and geothermal energy produced on campus to reduce its dependence on fossil fuels, is building a second co-generation power plant to maximize fuel efficiency and gives incentives to employees who live near campus or carpool.

Informational plaques may alert students to the sustainable features that may not be otherwise apparent to the casual observer. In some buildings, cutaway portions of facility walls are exposed behind glass to reveal the insulating elements that lie behind the wall's surface.

dorm "how low can you go?" energy use challenge.

Other approaches may be more passive, but manage to change behaviors nonetheless. Students accept concepts of water conservation by using the waterless urinals and motion-activated faucets that are provided at an

Campuses are seeking ways to ensure that the buildings in which students live and learn reinforce the institution's commitment to sustainable design, operations and education.

Interactive features such as touch-screen building dashboards provide students with real-time information on the building's energy and water use. As the inclusion of such dashboards increases in future dormitory projects, residents can be invited to work with dorm-mates to take up a dorm vs.

increasing rate in campus facilities. The new emphasis on locally grown produce and the composting of food waste in college and university dining halls makes a positive statement to student diners.

By taking a strategic approach to student engagement in an institution's sustainable design and operation decisions and practices, campuses can turn their socially responsible policies into competitive advantage. When making college choices today, prospective students weigh an institution's commitment to social, economic and environmental leadership. A campus that presents students with an environmental classroom in the largest sense of the word offers them an academic community in which they can fully learn, live and engage the changing world that awaits them.

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