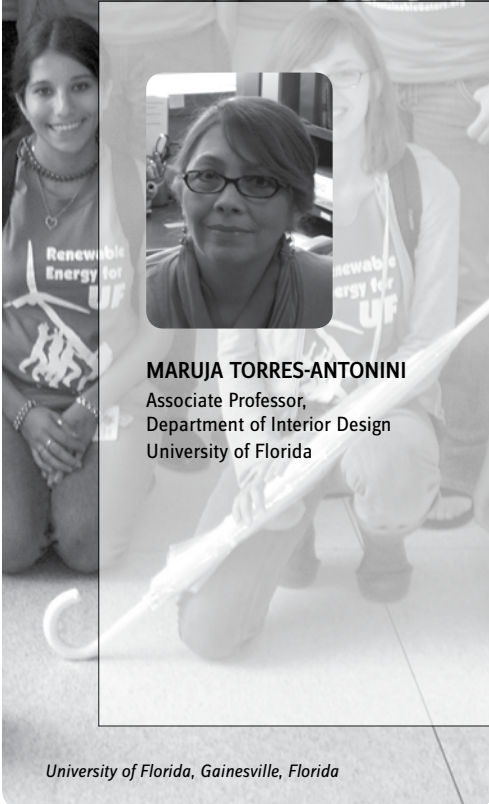


.....

Green Residence Halls Are Here: Current Trends in Sustainable Campus Housing



MARUJA TORRES-ANTONINI
Associate Professor,
Department of Interior Design
University of Florida



NORBERT W. DUNKEL
Assistant Vice President and Director
of Housing and Residence Education
University of Florida

University of Florida, Gainesville, Florida

.....

CAMPUS HOUSING HAS THE POTENTIAL for meeting the mandates contained in institutional sustainability commitments made by United States colleges and universities through the synergistic experience offered by its residence and education components. This article reports on a study of sustainable campus housing aimed at identifying opportunities for transformative pro-environmental education that may complement other institutional strategies already underway. It identifies and summarizes the types and characteristics of sustainable campus housing and provides an overview of current trends and practices within the last decade, as publicized directly by institutions between mid-2007 and 2008. The study recognized 87 self-described sustainable campus housing initiatives in United States colleges and universities, classified into three categories: green campus housing, centered on residential sustainability; sustainability-themed living-learning communities, centered on sustainability education; and campus housing sustainability “hubs,” which combine sustainability-centered residence and education components. Among others, findings suggested that the overwhelming majority of United States colleges and universities reporting sustainable student housing efforts are directed at building green residences, that the largest concentration of initiatives is found in the bi-coastal and Great Lakes regions, and that the private higher education sector has been quicker to embrace the greening of campus housing. The article calls on American colleges and universities to consider campus housing to help catalyze the transition to a sustainable society.

.....

With the pursuit of carbon neutrality as its main strategy, over 600 United States academic institutions have also signed the American College & University Presidents Climate Commitment since 2006.

United States colleges and universities acknowledge the responsibility vested in them to lead society in reversing the environmental degradation that now compromises our human, social, and ecological health. The 1990 Association of University Leaders for a Sustainable Future’s Talloires Declaration, embraced today by 378 colleges and universities from 50 countries, commits institutions

to a 10-point plan that includes “practicing institutional ecology,” “creating an institutional culture of sustainability,” and “educat[ing] for environmentally responsible citizenship” (AULSF, 1990, p. 8). With the pursuit of carbon neutrality as its main strategy, over 600 United States academic institutions have also signed the American College & University Presidents Climate Commitment since 2006. Pledges include taking immediate steps and developing a long-term plan to reduce their institutional carbon footprint in the spirit that “campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society” (ACUPCC, 2007, p. 1).

Campus housing has the potential for meeting the mandates contained in institutional sustainability commitments through the synergistic experience offered by its residence and education components. Awareness of this potential is captured in ACUHO-I’s 21st Century Project, which acknowledges sustainability today as a “deeply embedded expectation for campus operations and buildings” and thus recognizes sustainability as one of four major criteria for the design of state-of-the-art student residence facilities. This awareness is also reflected in the growing frequency of news articles on sustainable student housing initiatives evidenced in the national press and Internet media, ranging from green demonstration rooms, apartments, and houses and student-driven eco-houses to sustainable design-rated residences and sustainability-themed living-learning or residential learning communities. This diversity reveals not only a healthy interest in exploring sustain-

able campus student housing options but also the current lack of commonly accepted models or common agreement on best practices for the physical environment, operations, and programs of sustainable campus housing.

Educating for environmentally responsible citizenship requires appropriate instruction; however, instruction alone doesn’t seem to be able to bring about the behavioral change necessary to become sustainable. Studies show that “the adoption of new lifestyles [such as eco-friendly living] is often the result of social diffusion . . . [which] occurs primarily through the informal sharing of information” (McKenzie-Mohr & Smith, 1999, p. 139), a process facilitated in campus residence environments. Research into the potential of residence-based cocurricular education, including the contribution of the residence setting itself, may yield the information necessary to steer the residential experience of college and university students in the direction demanded by our century’s challenges.

Purpose. This study on current trends in sustainable student housing is framed as a research effort to identify opportunities for transformative pro-environmental education that may complement other institutional strategies for meeting the Talloires Declaration and climate commitments of United States colleges and universities. The general goal of this study was to identify strategies for student campus housing to advance sustainability through its residence and education components. The specific goal was to obtain a working understanding of characteristics and issues factoring in different interpretations of a sustainable student housing concept, which may facilitate dissemination of such on collegiate campuses. This article reviews

.....

the current state of sustainable student housing in United States colleges and universities. It identifies and summarizes the types and characteristics of sustainable campus housing and its trends and practices within the last decade, as publicized by institutions in print and online media between mid-2007 and 2008.

.....

Educating for environmentally responsible citizenship requires appropriate instruction; however, instruction alone doesn't seem to be able to bring about the behavioral change necessary to become sustainable.

.....

Method. Information was gathered over the course of one year from self-reported, public-access sources about broadly defined sustainable campus housing—current residential facilities and programs ranging from green campus housing to environmentally oriented living-learning communities. The literature review was conducted from clearinghouses, college and university Web sites, information hotlines, and other published material such as institutional newsletters and newspaper articles. Key for this study was Internet sources that track the progress of the collegiate sustainability movement, the dynamic nature of which enables them to keep pace with the rapid evolution of the movement and thus to provide timely reports to their audience.

The Association for the Advancement of Sustainability in Higher Education keeps and updates a list of sustainability initiatives, which are compiled in periodic bulletins and annual reports (AASHE, 2005-2009). Sustainable efforts in student housing are described in these publications under two categories corresponding with the education and residence components of campus housing: “Co-Curricular Education: Sustainability-Themed Living” and “Operations: Buildings: Residential Buildings.” The U.S. Green Building Council national database lists buildings, including student residences, in terms of their compliance with their Leadership in Sustainability and Environmental Design (LEED) standards (USGBC, 2007, 2008), adherence to which is pledged for all new campus construction by institutions signing the American College & University Presidents Climate Commitment.

The educational dimension of campus housing is addressed through instruments centered on residential programming, such as the Residential Learning Communities International Clearinghouse study (Midden, n.d.), the Evergreen College’s Washington Center national learning communities directory (The Washington Center, n.d.), and the comprehensive National Study of Living-Learning Programs (Inkelas, Szelenyi, Soldner, & Brower, 2007). The latter establishes the positive impact that living-learning programs have on residents’ engagement with collegiate environments, psychosocial development, and attainment of collegiate outcomes, giving consideration to thematic emphasis including environmentally focused residential learning communities, identified in 2007 as an emerging theme.

Simple content analysis was used to identify major demographic information and the regional spread and timeline of the development of sustainable campus housing and to classify these into categories based on the extent to which these residential communities address sustainability in their physical and programmatic dimensions. Information gleaned through these various methods was cross-referenced for accuracy. Sample institutions among those originally perceived as being the most comprehensive yet exemplifying a variety of approaches were selected for in-depth examination; information was gathered through e-mail and telephone communication with institutional contacts following approved protocols. Further breakdown of these data was done to extract information on their architecture, organization, services, educational requirements and activities, and environmental profile.

Attempts at providing an all-encompassing picture of sustainable campus housing are limited by its constant evolution and lack of uniformity in the designations and descriptors associated with sustainable housing on college and university campuses. Further limitations are inherent in the exploratory nature of the method used in this study, which relies on institutions to self-identify as having “sustainable campus housing” and to report these efforts to the public. Findings reported herein are therefore not comprehensive and are presented as opportunities for further research.

CAMPUS HOUSING IS GOING GREEN

This study recognized 87 self-described and self-reported sustainable campus housing initiatives in United States colleges and univer-

sities, aimed at either sustainable building, sustainability education, or both. The study focused on higher education institutions, whether public or private, which by addressing sustainability through student housing signify their commitment to embrace this emerging paradigm. It excluded a growing number of designated “environmental colleges” and so-called “colleges that make a difference” (Weinstein, 2006), where sustainability is intrinsic to their institutional mission and therefore integral to all campus operations, including campus housing. Outside of these sustainability-intensive colleges, three categories of sustainable campus housing initiatives were identified: green campus housing, sustainability-themed living-learning communities, and campus housing sustainability “hubs.”

Green Student Housing

This category, referred to as BLACK in the tables and figures that follow, comprises student residences purposefully designed and operated to meet, as well as model, optimal energy efficiency and overall environmental performance. These residences are green buildings, defined as those that maximize energy, water, and materials use and that minimize and ultimately eliminate negative impacts on human health and the environment throughout their life cycle (USGBC Research Committee, 2007). Their successful sustainability efforts in construction and operation are documented in reference to nationally known sustainable design measures and claims of seeking or having attained LEED certification, Energy Star rating, or other high environmental performance standards. However, these campus residences do not specifically report having a corresponding sustainability education program in place.

Whether associated with formal academic programs or not, sustainability-themed living-learning communities concentrate on the study of environmental concepts as well as on fostering a green lifestyle. They emphasize residential programming, but there are no outstanding claims in their reported information that the physical setting for their programs is particularly sustainable.

Sustainability-Themed Living-Learning Communities

Grouped in this category, labeled WHITE in the tables and figures below, are campus residences that meet the operational definition of residential learning communities: “a residential education unit in a college or university that is organized on the basis of an academic theme or approach and is intended to integrate academic learning and community living” (Midden, n.d.). Whether associated with formal academic programs or not, sustainability-themed living-learning communities concentrate on the study of environmental concepts as well as on fostering a green lifestyle. They emphasize residential programming, but there are no outstanding claims in their reported information that the physical setting for their programs is particularly sustainable.

Campus Housing Sustainability Hubs

This is the designation given in this study to campus housing, labeled GRAY in the tables and figures below, which combines the characteristics of the two preceding categories. These settings provide a comprehensive student experience where the sustainability principles and pro-environmental lifestyle encouraged in the community are both illustrated and supported by a green living environment because

the design features of the residential building—whether the use of reclaimed or renewable source materials, compact fluorescent lamps and solar panels, and efficient water management systems; or provision of spaces for communal meals, facilities for recycling waste, or storage space for bicycles or other forms of alternative transportation—deliver the desired energy and resource efficiency . . . [alongside] environmental education. (Torres-Antonini & Park, 2009, p. 32)

Studies indicate that the enhanced interaction and participation fostered in learning communities can result in positive attitudinal and affective change (Cross, 1998). Participation in community (Blewitt, 2004) and integration of knowledge into daily life (DeLind & Link, 2004) are noted as key to the adoption of sustainable values and behaviors. In this light, the promise of learning communities to effect both intellectual and behavioral change, when supported by a physical setting that facilitates and models environmental stewardship, makes them ideal vehicles for delivering sustainability education. This makes the hubs identified in this study possible benchmarks for sustainable campus housing.

Table 1

Institutional Profile for Sustainable Campus Housing Initiatives					
Public vs. Private					
	Black	Gray	White	Total	
Public	21	4	4	29	
Private	38	7	13	58	
Institutional Population					
	Black	Gray	White	Total	
Up to 5,000	20	5	4	29	
5,000 to 20,000	31	4	8	43	
Above 20,000	8	2	5	15	

Institutional Setting

Table 1 presents a profile of higher education institutions pursuing sustainability goals through sustainable campus housing. It suggests that the private higher education sector has been quicker to embrace the greening of campus housing. Private colleges and universities account for 38 green campus housing, 13 sustainability-themed living-learning communities, and 7 campus housing sustainability hubs, or two-thirds of all reported initiatives. In contrast, public colleges and universities report only 29 or one third of those: 21 green campus housing, 4 sustainability-themed living-learning communities, and 4 campus housing sustainability hubs. Of colleges and universities reporting sustainable campus housing efforts, approximately half are mid-size institutions

with student populations between 5,000 and 20,000, one third are small institutions with enrollment less than 5,000 students, and the remainder or 17% are large institutions with more than 20,000 students. Follow-up with select institutions showed that, as expected, efforts are aimed preferentially at the traditional single student population, whether graduate, undergraduate, or mixed. Of the 87 sustainable student housing initiatives identified in this study, only one—the Ecovillage in Berea College, Kentucky—provides housing for student families.

Regional Spread

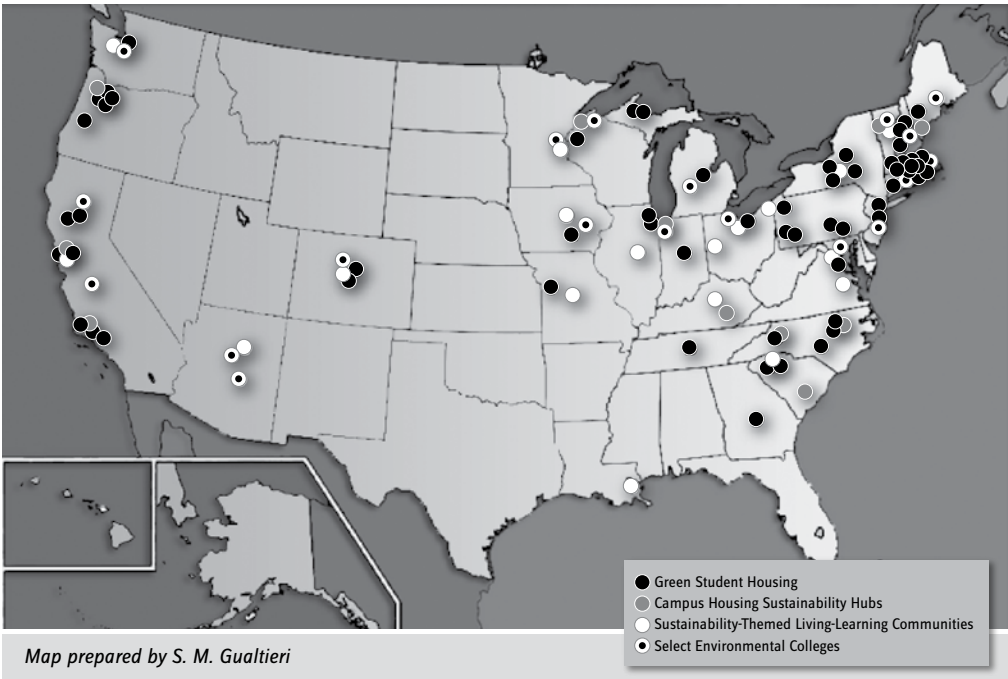
Figure 1 shows the location of these campus housing categories on the United States map, with black dots representing green campus housing, gray dots representing campus

housing sustainability hubs, and white dots representing sustainability-themed living-learning communities. Select environmental colleges, represented by white dots with a black center, are featured to exemplify this category. Figure 1 shows the largest concentration of sustainable campus housing initiatives in the bi-coastal and Great Lakes regions: 12 or more initiatives each in New England (18), Pacific (17), South Atlantic (14), East North-Central (13), and Middle Atlantic (12); the leading states are Massachusetts and California (9 each), followed by North Carolina and Oregon (6 each) and Pennsylvania and New York (5 each).

The West North-Central, Mountain, and East South-Central regions are represented with 3 to 5 initiatives, and the West South Central region with 1. Figure 1 also illustrates that reported sustainable efforts in campus housing tend to be preferentially directed at the construction of green residences, also shown in Figure 2A. Given that development of programs is presumably easier than construction or renovation of student residences, it may be hypothesized that creation of sustainability-driven educational programs is less frequently announced to the public and thus underrepresented in this study.

Figure 1

Regional Spread of Sustainable Campus Housing Initiatives in United States Colleges and Universities



Emphasis

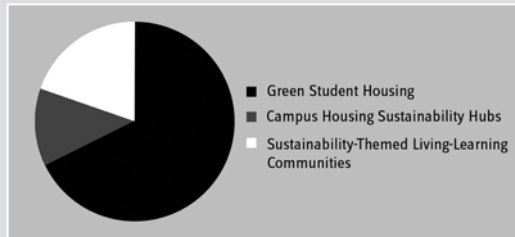
Out of the 87 sustainable campus housing initiatives identified in the course of this study, 59 initiatives or 68% correspond to green campus housing, 11 initiatives or 13% to campus housing sustainability hubs, and 17 initiatives or about 19% to sustainability-themed living-learning communities. Combining the last two categories, it appears that roughly a third (32%) of sustainable campus housing initiatives

emphasize sustainability education through dedicated residential programming. As seen in Figure 2A, the similar number of over two-thirds of green student housing initiatives, when added to the sustainability hubs—which also include a sustainable physical setting—suggest that the overwhelming majority of United States colleges and universities reporting sustainable student housing efforts (81%) are building green residences.

Figure 2

Trends in Sustainable Campus Housing Initiatives

A) Distribution of Sustainable Campus Housing Categories



B) Timeline of Construction of Sustainable Campus Housing

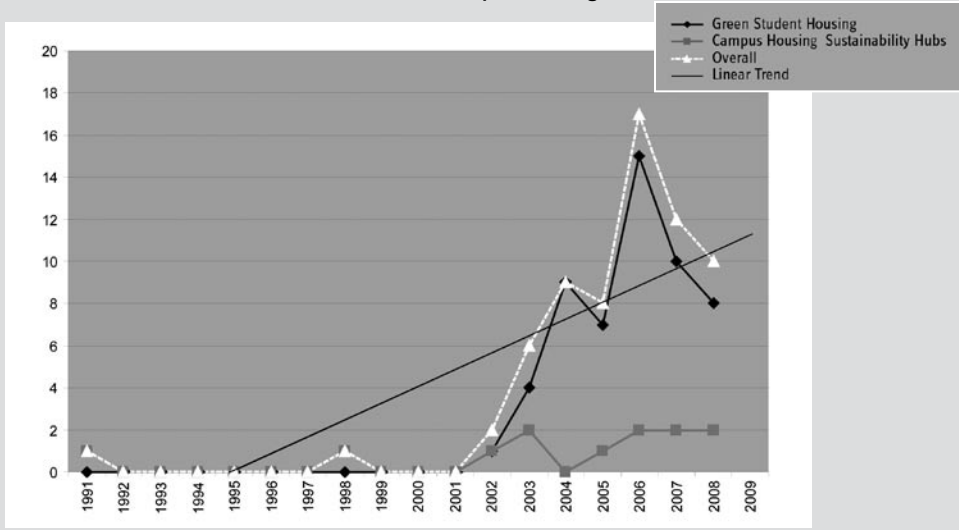


Table 2

Sustainable Campus Housing Construction Trends

Sustainability Level					
	Black	Gray	Sub-Total	Total	
LEED Certified	14	0	14	29	
LEED - Silver	18	2	20	58	
LEED - Gold	11	5	16		
LEED - Platinum	0	1	1		
Total LEED				51	
Green design	16	3		16	
Residential Setting					
	Black	Gray	White	Total	
Building	57	10	0	67	
House	0	1	6	7	
Floor	0	0	10	10	
Dorm	2	0	1	3	
Residence Population					
	Black	Gray	White	Total	
Up to 10 Beds	2	1	5	8	
10 - 100 Beds	13	2	6	21	
Above 100 Beds	30	8	1	39	
Undeclared	14	0	5	19	

Timeline

As shown in Figure 2B, a timeline for green campus housing construction indicates an ascending linear trend over the last 10 years, loosely corresponding with the signing of institutional commitments to educate for, and uphold, sustainability and to deter the progres-

sion of climate change. The trend was initiated in 1998 with the construction of Northland College’s McLean Environmental Living and Learning Center in Ashland, Wisconsin, and peaked in 2006 with the construction of 17 green residences. Despite an apparent slowdown, the

Enrollment may be open or conditional upon participation in an academic program ... Students may be required to take mandatory coursework, participate in organized projects or activities, or both, or they may be encouraged to participate voluntarily in organized educational activities. Activities and projects—including planning and delivery of programming, residence operations, and even creation and development of the sustainable residence—are largely driven by student interest and direct participation.

spread of green campus housing seems to have stabilized at 10 to 12 new constructions per year in 2007 and 2008. At least three new green campus housing projects have already been announced for completion in 2009.

Sustainable Construction

As illustrated in Table 2, a strong majority of green campus housing—73% including campus housing sustainability hubs—are currently seeking or have been awarded LEED ratings. Out of these, 14 or 20% report LEED Certified status, 20 or 29% report LEED Silver status, and 16 or 23% report LEED Gold status.

Only one residence—Goshen College's Merry Lea Environmental Learning Center in Wolf Lake, Indiana—reports having received LEED Platinum, the highest level of certification. However, a robust 19 communities having sustainable design on a par with LEED standards, or 27%, do not report intent to seek LEED rating. Informants frequently cited as reasons for this either dissent with the LEED system or the cost and difficulty of meeting sustainability benchmarks under their particular circumstances. These included available funding and the realities of having to deal with existing campus housing stock: the need to use pre-existing, and in some cases historic, buildings or to occupy sections of larger structures.

Residential Setting

Findings from this study suggest that the physical settings for the sustainable campus housing initiatives identified in this study consist mainly of complete buildings. Shown in Table 2, these comprise 67 structures, or 77% of the total, whether they are buildings repurposed or upgraded to meet sustainability standards or are newly designed structures. Housing capacity in these buildings tends to be over 100 beds. In contrast, the strategies of choice for sustainability-themed living-learning communities tend to be small houses and themed floors in existing buildings, typically housing up to 100 students. Follow-up with select institutions showed that about one half of these residences occupy a whole house or multi-story building complete with service, educational, office, dining, and/or social or recreational facilities that may include specially dedicated outdoor spaces. Approximately a third occupy one floor or more or a portion



of a floor in an existing or built-for-purpose building. Similarly, this layout may include, in addition to the residential units, designated or shared complementary facilities.

Programs

Direct information obtained in this study indicates a wide variation in key elements of residential programs. Their focus is expressed in terms of environmental education or sustainable living, with goals of practicing sustainable behaviors or promoting “environmental stewardship,” “ecological literacy,” or “sustainability ethics.” Enrollment may be open or conditional upon participation in an academic program, usually in environmental disciplines, natural or agro-sciences, or engineering. Students may be required to take mandatory coursework, participate in organized projects or activities, or both, or they may be encouraged to participate voluntarily in organized educational activities. Activities and projects—including planning and delivery of programming, residence operations, and even creation and development of the sustainable residence—are largely driven by student interest and direct participation.



The sustainability campus housing hub ... combines the emergent pedagogies of active and collaborative learning in higher education and the current redirection of interest in academia toward eco-centric concerns.

Operation of the residence may rely on paid staff, volunteer students, or both. Faculty participation may vary from loose supervisory roles to fully invested faculty-in-residence. However, in general, respondents suggested that participation in leisure or enrichment activities that invite sustainable living and encourage making desirable life choices—such as conserving energy and resources, recycling, composting, and fostering use of alternate transportation—is expected and does occur to varying extents in their communities.

DIRECTIONS FOR SUSTAINABLE CAMPUS HOUSING

Environmental educator David Orr encourages us to capitalize on the educational power of buildings by using the collegiate campus as a “tangible model” of sustainable practices (Orr, 2002). The campus housing sustainability hub has the potential to be this model. It combines the emergent pedagogies of active and collaborative learning in higher education and the current redirection of interest in academia toward eco-centric concerns. This is a new idea that has yet to reach its full potential and will benefit from the examination, debate, and refinement that can be expected to happen as these communities—in their many manifestations—are implemented over time. Further experimentation is needed, and should be encouraged, to test the limits of this idea. The inspiration is Orr’s remark that “the question is not whether colleges and universities could help catalyze the transition to a sustainable society, but whether they have the vision and the courage to do so” (Orr, 1992, p. 8).

REFERENCES

- AASHE. (2005-2009). Association for the Advancement of Sustainability in Higher Education. Retrieved January 2009, from <http://www.aashe.org/>
- ACUHO-I. (n.d.). ACUHO-I 21st Century Project. Retrieved July 30, 2008, from <http://www.21stcenturyproject.com/>
- ACUPCC. (2007). American College & University Presidents Climate Commitment. Retrieved January 2009, from <http://www.presidentsclimatecommitment.org/html/commitment.pdf>
- AULSF. (1990). The Talloires Declaration. Retrieved July 30, 2008, from http://www.ulsf.org/programs_talloires_td.html
- Blewitt, J. (2004). Sustainability and lifelong learning. In J. Blewitt & C. Cullingford (Eds.), *The sustainability curriculum. The challenge for higher education* (pp. 24-42). London, UK: Earthscan.
- Cross, K. P. (1998). Why learning communities? Why now? *About Campus*, 3(3), 4-11.
- DeLind, L. B., & Link, T. (2004). Place as the nexus of a sustainable future: A course for all of us. In P. F. Barlett & G. W. Chase (Eds.), *Sustainability on campus: Stories and strategies for change* (pp. 121-137). Cambridge, MA: The MIT Press.
- Inkelas, K. K., Szelenyi, K., Soldner, M., & Brower, A. M. (2007). *National study of living-learning programs: 2007 report of findings* (Study Report). Ann Arbor, MI: University of Maryland/Center for Student Studies.

- McKenzie-Mohr, D., & Smith, W. (1999). *Fostering sustainable behavior*. Gabriola Island, BC: New Society Publishers.
- Midden, R. (n.d.). The Residential Learning Communities International Clearinghouse publication. Retrieved January 2009, from Bowling Green State University <http://pcc.bgsu.edu/rlcch/index.php>
- Orr, D. W. (1992, Spring). The problem of education. *New Directions in Higher Education, The Campus and Environmental Responsibility*, 77, 3-8.
- Orr, D. W. (2002). *The nature of design: Ecology, culture, and human intention*. New York: Oxford University Press.
- Torres-Antonini, M., & Park, N. K. (2009). Sustainable student campus housing in the U.S. *International Journal of Spatial Design and Research*, 8(10), 29-38.
- USGBC. (2007). LEED registered projects. Retrieved July 2007, from <https://www.usgbc.org/ShowFile.aspx?DocumentID=2313>
- USGBC. (2008). LEED projects directory. Retrieved November 18, 2008, from <http://www.usgbc.org/LEED/Project/RegisteredProjectList.aspx>
- USGBC Research Committee. (2007). *A national green building research agenda*. Retrieved January 2009, from <http://www.usgbc.org/ShowFile.aspx?DocumentID=3402>.
- The Washington Center. (n.d.). Retrieved January 2009, from http://www.evergreen.edu/washcenter/directory_entry.asp
- Weinstein, M. (2006). *Making a difference colleges: Distinctive colleges to make a better world* (10th ed.). Fairfax, CA: Sageworks Press.