



Forming a community partnership to enhance education in sustainability

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Abstract

Purpose – To provide an example of how colleges can partner with local EcoVillages to further sustainability curriculum on campus and the educational mission of the EcoVillages, and to strengthen ties with the community.

Design/methodology/approach – Describes four structured courses developed for the Environmental Studies Program, including sustainable communities, sustainable land use, sustainable energy and environmental futures. Additionally, independent research opportunities in wind energy, solar photovoltaics, and GIS/GPS developed as part of the curriculum. Describes numerous ancillary activities that have promoted sustainability across campus and the community.

Findings – Provides information about how to develop educational partnerships with community groups, foster sustainability education on campus, recruit additional faculty involvement, and influence college operations with respect to sustainability.

Practical implications – A very useful source of information for those involved in building sustainability curriculum and linking it to campus operations and community outreach.

Originality/value – This paper describes a unique partnership between a college and an intentional community that serves as a model for other colleges and universities.

Keywords Partnership, Sustainable development, Universities

Paper type Case study

Introduction

Environmental Studies (ES) Programs at undergraduate institutions face considerable challenges because they are inherently multi-disciplinary. This has led to a criticism of many such programs for curricular incoherence, shallow and hyper-diverse curricula and a lack of program planning and vision (Soulé and Press, 1998). As a relative newcomer to the growing number of ES Programs, Ithaca College (IC) sought to develop a focused curriculum in ES that incorporates the most successful aspects of other programs and the suggestions of critics of the academic discipline to provide a new model of education in ES. We chose to academically unify our curriculum by focusing on the concept of sustainability, and to broaden our course and research project offerings, while encouraging student community action, by formalizing our



partnership with a local model community of environmental sustainability, EcoVillage at Ithaca (EVI). This approach was suggested by Penn State University's successful combination of curriculum and community affiliation. While the Penn State Program addresses scientific indicators of sustainability over time on campus, we apply scientific analysis to a model sustainable community and to local sites where students develop perspective on real-world environmental problems and solutions. Many universities have developed excellent curricula in sustainability (Leal Filho, 2002), which have provided many valuable insights for our own program. What distinguishes our program is that it is the first true educational collaboration between a college and a sustainable community.

IC's ES Program and EcoVillage established a teaching/research partnership organized around issues of community sustainability. The partnership and the ensuing projects were made possible by a 3-year grant from the National Science Foundation's Curriculum, Course and Laboratory Improvement Program in 2002. This partnership and theme of sustainability have become cornerstones for the ES major. Initiated in 1998, IC's interdisciplinary ES Program was constructed on a strong scientific grounding. The core curriculum includes topics recommended by Soule and Press (1998) including specific environmental courses in science, chemistry, field biology, ethics, politics, history and economics, as well as courses in computer applications and statistics. In addition to core courses, majors are also required to pursue 21 credits in a self-designed area of concentration: to date, the majority of students have chosen the natural sciences for their area of concentration. The major also requires a capstone experience, which can take the form of a research seminar, internship, or independent study. The capstone provides students with an opportunity to apply theoretical knowledge, refine research skills, and integrate information from multiple disciplines, all essential for solving real-world environmental problems (Hoagland and Fathe, 1998; Maniates and Whissel, 2000).

The ES Program is growing rapidly. The number of majors more than quadrupled – from 9 to 53 majors – between 1998 and 2004. The number of minors increased to 15 in 2004. As the number of majors and their areas of interest expand, so do the challenges of developing curricular coherence and assuring meaningful capstone experiences. The courses on sustainability provide a practical and appealing curricular option that is both flexible (in terms of internship and research options) and coherent (in its emphasis on scientifically grounded approaches to sustainability). They offer preparation and venues for high quality “capstone” experiences for the growing cadres of majors and minors now in the pipeline.

Moreover, ES majors and minors are only the core of those students served by the curriculum. A number of departments offer courses related to ES, such as environmental law and policy (in business), environmental anthropology (in anthropology) and nature and society (in sociology). Students in these classes, who have an interest in environmental issues but who do not choose ES as a major or minor, find the courses attractive for practical study of environmental problems. In other words, coursework in sustainability serves students across the IC campus.

IC is fortunate to be located in close proximity to a model sustainable community. Less than two miles from Ithaca's downtown and Cayuga Lake (and about three miles from IC), EVI is a growing intentional community of 60 households dedicated to exploring and modeling innovative approaches to ecological and social sustainability.

Its unique habitat integrates the best aspects of urban and rural living and includes co-housing, organic agriculture, and natural areas, preserving and restoring over 80 percent of the land as green space. The residential component of EVI comprises tightly clustered co-housing neighborhoods surrounding a village green. The 176-acre site of farmland and woods borders a nature preserve. EVI is a participant in living routes, a consortium that brings together EcoVillages and academic institutions from around the world to cooperate in developing sustainable physical and social systems for communities. The EcoVillage Education and Research (EVER) Center aims to explore and teach systemic solutions to the environmental and social crises of our time through practical programs, reaching out to a wide range of population groups. Residents include university professors, software developers, green building contractors, organic farmers, school teachers, and renewable energy installers. EcoVillage has gained an international reputation for sustainable community development, and has been featured on CNN, PBS, NPR, *The New York Times* (Vizard, 1997), *The Wall Street Journal* (Aepfel, 1994), and *Popular Science* (DiCristina, 1996). Thus, EVI represents access to a remarkable array of talents and models upon which Ithaca students may draw.

Program goals

Our goals for this program are to advance opportunities for undergraduates to learn about sustainability and to become involved in science-based community ecological projects. Our specific objectives are to:

- develop a teaching/research partnership between IC and EcoVillage to expand the curriculum in ES and the natural sciences by hiring EVI residents to teach specialized courses as adjunct instructors;
- develop new, scientifically-based courses and course modules on sustainability;
- strengthen the scientific understanding of sustainability in the ESP curriculum already established;
- educate students in applied scientific techniques of sustainability indicators and footprinting by evaluating two diverse communities as long-term case studies;
- provide science-based and sustainability-based internship and practicum opportunities for IC students and other students in the region; and
- provide scientifically grounded advice to encourage environmentally sustainable practices in the local community.

We focus our curriculum on comparative community analysis of indicators. Our motivation stems from the experience of IC and other institutions that community partnerships offer unique and valuable educational opportunities (Herzberger and Chapdelaine, 1998; Zlotkowski, 1996). Further, we emphasize the interrelationships among human-nature systems by examining these connections in detail at EcoVillage and the larger community.

By combining the scientific evaluation of sustainability with study of the integrated ecological and social systems of EcoVillage, we are developing a unique program of study that IC and other institutions can build from in the future. Through focus on place-based perspectives on the environment, students will be directed towards a “scholarship of engagement”, to quote D. Benzing (Hoagland, 2000). Students explore

the environmental impact of campus life, but also consider “how it could be” by studying EcoVillage and other model communities that attempt to use ecologically appropriate technologies to achieve their vision.

IC’s willingness to financially match the funding from the National Science Foundation has allowed us to build a unique program. What began as a relatively modest effort to create a distinctive learning experience for ES students has mushroomed into a campus and community-wide initiative and commitment to sustainability.

Project components

With these stated objectives, we launched several project components: course development, research and internships, faculty development, and public outreach. As such, we developed four new courses to be taught through the IC ES Program, along with a series of Independent Studies and Individual Student Research Projects. Small Summer Curriculum Grants were also offered to IC Faculty and EcoVillage residents to develop course materials and modules devoted to some aspect of the science of sustainability.

New course development

The four courses funded as part of the project are: *Sustainable Communities*, *Sustainable Energy Systems*, *Sustainable Land Use*, and *Environmental Futures*. As of September 2004, three of those four courses had been taught, and the fourth, *Sustainable Land Use*, is currently being taught for the first time.

Sustainable communities. This was a four credit field/lab course, first taught in Spring 2003. Fifteen students enrolled in the course (exceeding the set course limit of 12 students), including several students from two other colleges in the region. The course was taught by Elan Shapiro, educator, director of sustainability associates, and a resident of EcoVillage with broad background on issues related to environmental sustainability. Speaking of the personal value of teaching this course, Shapiro said, “What excited me about teaching the course was that we got to balance so many levels that were enriching to both students and faculty”.

The major goal of the course, aligned with the emerging discipline of “sustainability science”, was to facilitate an understanding of how our cultural assumptions and behaviors and our corresponding design and technology strategies interact with the natural systems around us and how we can improve our capacity to guide those interactions in more sustainable patterns.

Many course lectures were conducted on the IC campus, while others (as well as a variety of course projects) were conducted at EVI. Members of the EcoVillage community served as Resident Faculty. Other members of the local community, including a forester focused on sustainable yield and the director of an organic student-run farm, were also brought into the class to share their knowledge and expertise.

One highly successful aspect of the course was the “practice journal”, designed to encourage students to develop awareness of changing attitudes toward the natural world and to track patterns of consumption and other aspects of everyday practice. Students were also required to develop a research project, in concert with members of

the EcoVillage community, designed to meet a community need. These projects focused on EcoVillage's energy use, transportation issues, and botanical inventory.

Sustainable energy systems. This course, offered in Fall 2003 was team-taught by Jon Harrod, Manager of Performance Systems Contracting and a resident of EcoVillage, and Beth Clark-Joseph, IC Physics Department. The course was designed to introduce students to the economic and environmental opportunities created by energy efficiency, with an emphasis on energy use in residential buildings. This course also included academic and projects-based components. Written assignments included a "personal impact assessment", an essay on features of homes visited on the "National Tour of Solar Homes", and an "Energy and Economics Problem Set". Students were also required to undertake a group project, which involved creating a plan for more sustainable energy use in Tompkins County, New York.

Similar to all our other EVI adjunct instructors, Harrod found teaching the energy course professionally and personally enriching. Specifically, he appreciated the opportunity to go beyond his primary job as a heating and insulation contractor to look at broader social, political, scientific, and economic dimensions of energy use. One of the largest conclusions from this class is that the technologies we need to make the transition to a sustainable energy future are already here and already cost-effective.

Environmental futures. This team-taught class served as the "capstone" course for ES majors, and thus fulfilled an important curricular requirement. The instructors were a biologist (Susan Allen-Gil) and an anthropologist (Garry Thomas). The course focused upon "the sustainability of various life styles" in industrialized and pre-industrial societies. Various field trips were undertaken, one to an area wind farm and another to a local biofuels processing and automobile conversion facility.

Students were required to participate in two of three "tracks". The first involved analysis of the eco-footprint of a local neighborhood (either in the city of Ithaca or an EcoVillage neighborhood) using field research and ecological footprint software developed by Mathis Wackernagel. The second track involved participation in community and campus discussions of sustainability that were organized in connection with the Sustainable Tompkins (ST) Initiative (see below). Students provided background reading material for community focus groups on sustainability, helped facilitate community meetings and discussions, and summarized the outcomes for the ST co-ordinating committee. The third track involved the development of demonstration projects on sustainability. Students developed two projects. The first was a demonstration of sustainable building practices in the form of a triangular kiosk (2 perpendicular walls and a floor) that shows several different wall and insulation options (such as straw bale, cellulose) and locally grown or recycled flooring products. The second project was the creation of Earth Café 2050, an interactive ecological footprinting activity modeled after a deli-style cafeteria in which the "menu" is a series of multiple choice questions about the "customer's" lifestyle from which the servers calculate and deliver their "order": wooden blocks corresponding to the acreage required to support the lifestyle. Earth Café 2050 debuted at a regional summit on sustainability held at IC, and since then has been used in orientation programs, for Earth Day on campus and in the community and has been adopted by the Arizona Department of Environmental Quality, and The Learning Web Program in the local school system.

Sustainable land use. This course, offered for the first time this semester (Fall 2004), is being taught by an EVI resident as a 4 credit field course. Students are learning to use tools and skills that directly contribute to the EcoVillage's current projects and to the development of its first comprehensive land use planning process in over a decade. The course also emphasizes a *regional* context for land and water use by linking up with the other progressive land use experiments in the region, and sustainable land use projects on the IC campus. The course adopts a place-based approach by appreciating the interrelatedness of the different living systems in a particular place, including the human communities, as an essential common ground for sustainable land use planning and action. The learning approaches include:

- learning through dialogue, collaboration, community;
- student-centered reflective learning (e.g. nature observation in solo spots and freewriting in journals) and development of critical thinking;
- place-based learning, through direct observation and interaction with immediate natural systems and human communities;
- learning by doing and serving (e.g. assisting with agricultural, landscape, and restoration projects on field trips, and engaging in semester-long service projects). Learning earthcare skills and community building skills;
- systems learning – through connections and relationships, seeing common and disparate patterns in global, regional, site-based and personal and group systems, going back and forth between those systems; and
- learning through play, creativity, and the reawakening of wonder, innocence and connectedness.

A major component in the course is group projects. One team of students are researching the applicability of permaculture design principles to land use planning at EcoVillage and specifically to U-Pick “CSA” Berry farm being developed by one of the residents. A second team is researching ways to improve pedestrian links between the IC campus and Downtown Ithaca. A third team is working with the IC grounds team on experimenting with sustainable alternatives to the current landscaping of annual flowerbeds. A fourth team is developing a plan for Tutelo Park, which commemorates the Native American culture and land use heritage in our immediate area.

Students also are required to keep “special spots” journals, which captures their reflections from revisiting a location (on EVI land, on or near the IC campus, or in their home environs) that is special to them many times over the semester. The intent is for students to observe and connect with natural phenomena (plant cycles, wildlife corridors, weather patterns, human use patterns, etc.) and consider their own relationship to those phenomena.

Infusing sustainability into existing courses

All education is environmental education... To teach economics, for example, without reference to the laws of thermodynamics or ecology is to teach a fundamentally important ecological lesson: that physics and ecology have nothing to do with the economy. It happens to be dead wrong. The same is true throughout the curriculum (Orr, 1994).

With this philosophy, we have worked to incorporate sustainability themes into new and existing courses across all academic units on campus. Over a two-year period, we have awarded ten \$1,000 summer grants to IC faculty. This has resulted in the infusion of sustainability into courses in Physics (Earth: Evolution of a Habitable World), Biology (General Ecology and Plants, People and Food Production), Economics (International Economics, Natural Resource Economics, Environmental Economics), Politics (Sustainable Politics – a First Year Seminar), Therapeutic Recreation and Leisure Service (Design and Operation of Areas and Facilities), Writing (Persuasive Argument), History (History of the Future), Health Policy Studies (Front Page Public Health: Policy and Epidemiology) and Business (Strategic Management).

Also, in an effort to more fully enhance to nature of the partnership between IC and EVI, we offered similar mini-grants in 2004 for EVI residents to develop curricula for IC courses that could either be instituted as independent study projects or as week-long modules for courses taught by IC faculty. This resulted in six funded proposals, including development of independent study projects focusing on car-share feasibility, wind-power feasibility, permaculture on a berry farm; and course modules on sustainability for IC's Teacher Education Program, and on sustainable humanism for IC courses in sociology and gerontology.

Research/independent study projects

Separate from the formal course offerings, we have developed a series of research projects to provide students with hands-on experience in many aspects of sustainability, including solar, green building, and GPS/GIS technologies.

The longest-running research project has been the development of solar photovoltaic systems for educational purposes. Directed by an EVI resident (Greg Pitts), students have constructed mobile solar PV systems on standard utility trailers (Plate 1). Students designed, produced construction documents, welded together the components, produced instruction manuals, and have given public lectures on the systems' development. The solar trailers have proven very useful as interactive demonstrations both on and off campus. For example, the trailer has been used to power music in the outside area where students congregate, and for the Apple Harvest festival in downtown Ithaca. It has also been used to explain solar technology in environmental science, chemistry and physics classes. Our future plans are to install a solar powered fountain in a high-visibility campus pond, and to develop a system to pump captured rain water to uphill flower beds at EcoVillage of Ithaca.

The second student research project focuses on green design and construction. With the help of a member of the art faculty at IC, students designed a bus shelter for EcoVillage that incorporated local materials and renewable energy with the needs of the community. The shelter (Figure 1) includes areas for bike storage and for the sale of organic produce grown on-site at West Haven Farm. EVI, as a community, has approved the construction of the shelter, and has applied for a building permit from the city of Ithaca. We hope to involve students in building the shelter in Spring 2005.

The third project involves the development of GPS/GIS capabilities for classes and students at IC. As part of a summer work internship program, students configured the GPS units (Trimble GeoExplorer XM) and the computer software (ArcGIS v.8), developed student-friendly manuals for their use, and a website for more information and local datasets.



Plate 1.
Mobile solar trailer built
by students, that is now
used for educational and
outreach

These research and independent study opportunities have been very successful in involving students from majors other than ES because of the variety of disciplinary applications. For example, students majoring in computers, business, and music have all pursued these projects for credit. The projects have also drawn Cornell University students majoring in architecture and engineering. In the future, we anticipate offering new opportunities related to wind power feasibility at both IC and EVI, permaculture at EVI, development of a car-share program, and educational outreach material for a local school program.

Faculty development

We have organized several curriculum workshops that served educational and team-building functions, particularly for the recipients of the summer grants. They also were a form of outreach in that residents of EcoVillage and faculty and staff members of IC have become more involved with grant-related activities as a result of attending one or more workshops. At the first workshop, held at a resident's home at EcoVillage, Barbara Anderson (founder of the Penn State Center for Sustainability) facilitated the discussion on how sustainability science can be integrated into the established curriculum using permaculture as an example. The second workshop featured an environmental attorney and sustainability management specialist, Edward Quevedo (WSP Environmental North America) who provided examples of sustainable business practices in the US and abroad. A roundtable discussion followed each of

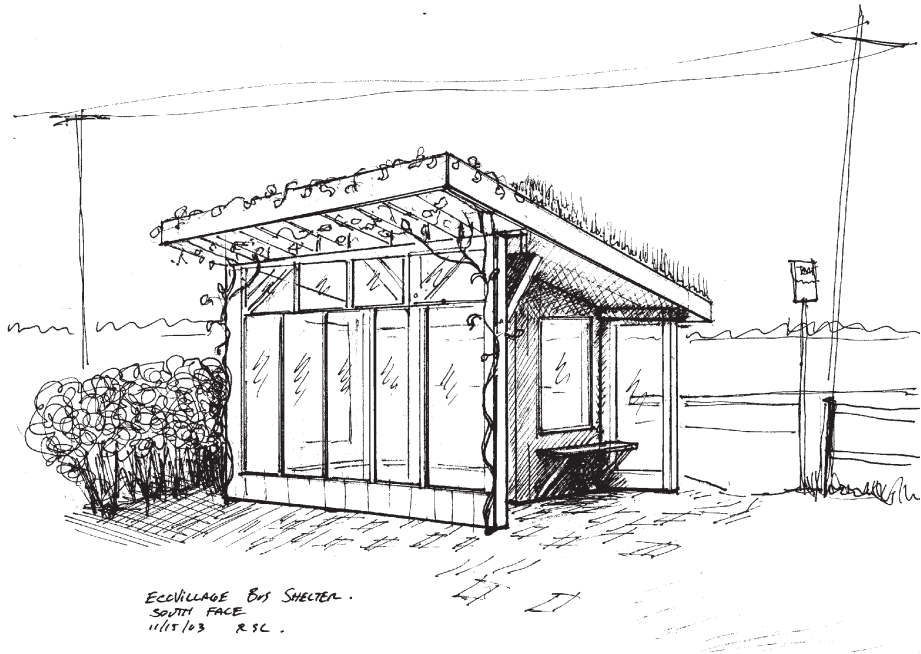


Figure 1.
Student plan for
sustainable bus shelter for
EVI

these workshops. Participants in these workshops included recipients of summer curriculum grants, who discussed their projects and sought advice from others in the group. The third workshop featured Robert Young (Cornell Department of City and Regional Planning). Held at EcoVillage and attended by more than 25 EVI residents and IC faculty, the focus of this meeting was to assist faculty and EVI residents as they began their work on integrating sustainability into the curriculum.

In our experience hosting the workshops, it has been critical that we feature an invited speaker to instill the group with new knowledge, and that we include time for informal exchanges between individuals with common interests who may not have known one other prior to the workshop. In informal discussions, faculty members with experience teaching sustainability said that they made time to attend the event specifically because of the invited speaker. Also, by building in some time for break-out sessions or small group discussions, we have been able to reap the benefits of cross-fertilization between academic departments and between academia and a sustainable community.

Outreach

As part of our goal of providing scientifically grounded advice to encourage environmentally sustainable practices in the college and local community, we have initiated an outreach program that consists of campus discussions, public lectures, and the spawning of a regional sustainability program, ST.

In order to keep the academic momentum building and expanding across the entire college, we launched a lunch-time Sustainability Café series in 2004. Acquiring the funding for public speakers and locally-grown organic food from an internal IC grant

fund, we invited faculty in various departments (e.g. business administration; organizational communication, learning and design; history; economics; biology; and physics) to each host a Café that would address sustainability within the context of their discipline but that would also appeal to a broader audience. We encourage the facilitators to constrain any public speaking to half the available time so that there is ample opportunity for discussion or small group activities. This format has been highly successful; we now are solicited by faculty across campus for the opportunity to host a sustainability café.

The goal of our public lecture series is to lure as many people as possible from campus and the community and to encourage them to enter the sustainability dialogue. In the last two years, speakers on campus have included Sandra Steingraber (author of *Living Downstream* and *Having Faith*), Edward Quevedo (WSP Environmental Attorney), David Orr (author of *Earth in Mind, Ecological Literacy* and *The Nature of Design: Ecology, Culture, and Human Intention*), Bill McKibben (author of *Enough: Staying Human in an Engineered Age* and *The End of Nature*), Jim Merkel (author of *Radical Simplicity*) and Betsy Taylor (President, Center for a New American Dream).

Lastly, we have launched a regional sustainability program in Tompkins County. In September 2003, we held a workshop that brought together 40 local leaders in government, academia, business, non-profit and environmental organizations to discuss regional sustainability management and sustainable development. Ed Quevedo shared experiences of working with sustainable Sonoma County, and encouraged attendees to identify the major environmental, social and economic challenges faced by our region, and to brainstorm the first steps toward implementing a regional sustainability management plan for the greater Ithaca area. The workshop, organized by IC, EcoVillage and the City of Ithaca, was probably one of the largest, most diverse groups to meet at City Hall and work collaboratively in years. Seeing the community interest, we approached the Provost and the President of IC for seed funding to conduct a regional sustainability feasibility study. With this start and with additional funding from local businesses, foundations and non-profit organizations, we have begun a regional program, similar to those in many other communities, such as Seattle, WA; Sonoma, CA; and Vancouver, BC. An integral component of our regional sustainability program is the involvement of IC students in coordinating events, developing outreach materials, and carrying out sustainability projects in the community.

Conclusions

What we could not have guessed two years ago was that the collaboration between IC and EcoVillage would have even more far-reaching effects than a handful of courses could offer. As the small coordination team of three IC faculty and two EVI residents has worked together, we have joined with others to begin building a critical mass which has the potential for creating major, positive changes at both IC and EcoVillage, as well as within the surrounding region. By drawing on the inspiration and expertise of outside consultants, as well as our own experiences, a clear vision has gradually emerged.

At IC, the vision includes creating a firm campus-wide commitment to environmental sustainability. Although it is too early to tell exactly what direction

this will take, some curricular initiatives suggested were a first-year seminar such as “Sustainability 101”, guest lecturers in classes, and a minor or major in sustainability studies. There have also been discussions about the possibility of creating a sustainability institute, which would focus multi-disciplinary approaches to researching solutions to ecological problems faced by both the public and private sectors.

At EcoVillage, the vision includes an increasing commitment to creating successful learning experiences for students and residents alike, while developing our internal capacity for teaching college-level courses. We would like to develop housing for some students to live and work on-site at EcoVillage. In the long-term, we hope to build a Sustainability Education Center. This would be complementary to any facilities which IC develops.

The small group of “burning souls” which has carried out the core work of developing curriculum on the science of sustainability has rapidly expanded both its members and its mission. The flame of interest in creating a genuinely sustainable world – one that pays attention to the triple bottom line of human capital, ecological resources, as well as economic well-being – is burning high.

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