Looking at Sustainability through a Different LENS

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Abstract

Summer enrichment programs sponsored by higher education institutions offer high school students opportunities to participate in a wide variety of academic learning activities. Designed to inspire scholarly curiosity and civic engagement, Wake Forest University hosted the LENS (Learn, Explore, Navigate, Solve) program during the summers of 2010 and 2011. In a three-week period, students were challenged to achieve a basic understanding of the ecological, social, and economic dimensions of sustainability and use that knowledge to complete a collaborative project and compose individual community action proposals. What follows is a report on the pedagogical strategies that a team of faculty from the departments of Religion/Environmental Studies, English, and the Z. Smith Reynolds Library adopted to integrate the academic and experiential modes of learning and foster a sense of civic engagement in the students. It illustrates how faculty can take the lead in developing innovative summer outreach programs for precollege students.

Introduction

There is a paradigm shift underway in society, from extractive modes of production, consumption, and wealth production toward more adaptive and environmentally sensitive modes of utilizing natural resources. But the change has been slow and often challenging. Such large-scale changes require a citizenry that is radically more informed about the complexities of sustainable production than most of the general public today.

The most pressing problems across the globe—famines, armed conflicts, demographic transitions—are the result of dynamic biophysical, social, and psychological processes. Solving such problems requires an educational system that encourages students to be adaptive learners who can anticipate disruptions and envision their solutions and attendant opportunities at multiple scales, from the local to the geopolitical. Many traditional classroom experiences do not encourage students to practice these kinds of skills, but employers, funding agencies, and even graduates recognize their centrality in the workplace. More and more students articulate a desire for employment in organizations that demonstrate a commitment to shared values, especially as they relate to issues of sustainability.

The Association for the Advancement of Sustainability in Higher Education (AASHE), the U.S. Department of Education, and other nonprofit endeavors, such as Peggy Barlett and Geoff Chase's Piedmont Project, are working to promote these goals and are reaching out to hundreds of faculty, administrators, and operations managers. AASHE's Sustainability Curriculum in Higher Education: A Call to Action was released following a summit on Sustainability in the Curriculum in February 2010 in San Diego, CA. The call outlines the challenges inherent in curricular change, including the scale of the issue (there are 1.2 million faculty in the United States alone), the multiplicity of curricula on campuses (from general education to graduate education and cocurricular education), the interdisciplinary nature of education for sustainability, and the diversity of types and sizes of educational institutions. Importantly, the call to action was directed at the K-20 system in the United States—kindergarten through graduate-level education. U.S. Secretary of Education Arne Duncan acknowledged that educators play an essential role in preparing students for jobs in the green economy, and that they also prepare students for their roles as environmentally literate and responsible citizens. Most importantly, he also acknowledged that the Department of Education had not yet done enough to lead this effort.

Launching LENS

Oftentimes, universities outpace government mandates for educational outcomes.
One place where rapid developments are afoot is among summer programming on university campuses. In order to raise its national profile as a university committed to its mission of producing graduates who are both unusually competitive in the job market and also responsible citizens, Wake Forest University (WFU) launched the first LENS (Learn, Experience, Navigate, Solve) program in 2010. Associate Provost for Global Affairs J. Kline Harrison saw the potential for a novel program that would not be a typical summer camp, but rather an intensive three-week academic program for rising junior and senior high school students, emphasizing pedagogical principles embraced at Wake Forest University: interdisciplinary, experiential, and collaborative learning; public engagement; close interaction between faculty and students; research and problem-solving; and writing to learn. We used these pedagogical principles to inspire students to confront and seek to understand the contemporary challenge of global sustainability.

With this vision as a starting point, the LENS program was born, and during their three weeks at Wake Forest University, the first cohort of 26 high school students experienced an intensive introduction not only to college life, but also to real-world problem solving as they attended classes on sustainability, heard expert guest lectures, participated in community service, and visited organic farms, local food markets, rivers, and forests. Students were grouped to work on specific environmental problems. One team strove to build the most efficient compost system within a budget; some worked in community gardens, some on traditional recycling; others tackled the problem of e-waste. In addition, each student was also challenged to write a community action proposal outlining how he/she might work with others to solve a sustainability-related issue in their hometown.

Creating Learning Outcomes and Core Competencies

The development of the LENS curriculum began with the creation of a set of learning outcomes and core competencies for the students, inspired and informed by the idea of the triple bottom line, which assesses successes relative not only to economic variables, but also to environmental and social variables. Local food and water systems provided the lens through which we discussed and analyzed efforts toward sustainability. The goal was to provide the students with both subject knowledge, and more importantly, with the skills, tools, and perspectives they would need to translate this local knowledge and act as responsible global citizens and effective stewards of a sustainable future.

Learning outcomes included the following:

- **Basic Sustainability Literacy:** In order for students to attain curricular literacy, they needed a basic understanding of each of the three dimensions of sustainability and the ways they intersect.
  1. **Ecological Dimension:** With regard to student learning outcomes, this included an understanding of key concepts in ecological science, systems theory, climate change, adaptive management and risk assessment, and sustainability.
  2. **Social Dimension:** Also important was an understanding of issues related to poverty, equity, human rights, health, environmental justice, and the social impact of science.
  3. **Economic Dimension:** An understanding of ecological economics, risk management, variables related to population and consumption, and tools for quantifying the value of ecosystem services were also highlighted.

- **Problem-Based Learning:** Students experienced real-world challenges related to sustainability, engaged in collaboration, and attained a level of cultural awareness and civic responsibility.

- **College-Level Writing Proficiency:** Students were also introduced to college-level writing and oral proficiencies, including the ability to write to explore, learn, and collaborate; to articulate complex problems in ways that foster productive dispute resolution; to consider how genre, purpose, and audience shape reading and writing processes; to frame a thesis, evaluate evidence, construct cogent arguments; and to integrate existing scholarship into their essays and oral presentations.

- **Information Literacy:** By the end of the program, students were to have achieved a basic level of information literacy and technological competencies to aid them as they gathered and analyzed a critical problem, evaluated data, and presented their ideas in written and verbal forms.

The Curriculum

The LENS curriculum consisted primarily of general introductory readings on sustainability as well as more specific readings related to food and water systems. Food and water systems were selected as foci because, as opposed to complex global issues such as climate change, eating and access to water are more tangible issues that lend themselves to hands-on, experiential education. The classroom component consisted of six classroom meetings and additional documentary films related to sustainability (typically screened in the evenings in the residence hall). Additional guest presenters included 16 faculty, administrators, or staff, and seven community members (among these were a city councilman, local farmer, city sustainability coordinator, and local business leaders).

The readings were selected for their general accessibility and included contributions from environmental authors such as Wendell Berry and Michael Pollan; author and New York Times columnist Thomas Friedman; business leaders such as Ray Anderson of Interface Carpets; scientists such Donella Meadows, Peter Vitousek, and E.O. Wilson; and philosophers such as Joanna Macy and Thomas Berry. The variety of readings challenged the students to draw connections between local-level issues and the large-scale social changes required to move toward sustainability.

Collaboration, Civic Engagement, and Problem-Based Learning

Because the course lasted only three weeks, it was imperative to build leadership and collaborative skills immediately. The first cocurricular activity included participation in a ropes challenge course, which facilitated group bonding and collaborative problem solving. All of the students reported that this was an excellent initial exposure to team building and experiential learning.

Many other experiential learning activities were threaded throughout the three weeks. The students took a field trip to River Ridge Land and Cattle Company, a sustainable beef production operation in southern Vir-
ginia that supplied some of its product to WFU food services for student and faculty consumption. Another worthwhile field trip took the students canoeing down the Dan River. For many of the students, this was their first time on a river.

Other activities included regular work in the university’s community garden, tours of WFU’s Reynolda House Museum, which at the time featured an exhibit celebrating the 150th anniversary of the publication of Charles Darwin’s On the Origin of Species. These cocurricular activities added an important experiential dimension that helped students recognize that learning occurs in and beyond the classroom, and also provided them with some of their most memorable experiences from the program.

Some of the most important lessons in collaboration stemmed from the students’ final group projects. These projects were their initiation into college-level academic research, facilitated by librarians. Each group chose a problem related to sustainability, researched the topic, and worked in teams to solve the problem, in some cases through actual hands-on projects, though some group projects focused primarily on research. For instance, one group investigated waste programs at college and university campuses, prepared a presentation and recommendations for the university, and wrote an op-ed article that was subsequently published in the local newspaper, the Winston Salem Journal, as well as WFU’s newspaper, The Old Gold and Black.

Another group spent their project hours working in the WFU Campus Garden. The Campus Garden donates its organic produce for Campus Kitchen, a nonprofit agency that distributes the harvest to food-needy agencies in Winston-Salem and prepares meals for the Children’s Home and other organizations. One particularly successful project involved research on various types of composting systems, which resulted in the construction of compost bins for the Campus Garden. The students were required to measure the approximate volume of food scraps that the compost system would need to accommodate, research the possible compost systems that were appropriate to handle that volume, and finally construct the proposed bin on a relatively small budget (approximately $100.00). The result was a remarkable three-stage composting system that continues to provide the Campus Garden with a consistent supply of fertilizer—an exceptionally entrepreneurial project engineered by high school students who can take their problem-solving skills home to their own communities.

Introduction to College Writing

Because the students were confronting complex academic ideas related to the ecological, social, and structural dimensions of sustainability while working together to solve practical problems, it was necessary to provide them with a tool to support them as they worked to connect the dots between interdisciplinary learning, research, and experiential knowledge, to facilitate collaborative problem solving, and to communicate their knowledge clearly and cogently. Writing to explore, to understand, to question, and to communicate were the tools they used.

Through a series of six writing workshops and mini-lectures, LENS students were introduced to college-level writing. During the first workshop, students learned the distinction between informal, writerly prose (used expressively for exploration and learning) and more formal, readable prose (used for communication and persuasion). Readerly writing, or writing to communicate, aims to accomplish something, to inform, to instruct, or persuade. Students practiced this kind of writing through Power Point presentations and a community action proposal. Students were also encouraged to practice and share informal writings, such as journals and critical reflections. The primary function of “expressive” (p. 4) language is not to communicate with others, but to encourage self-reflection.

We adopted a group blog, as a hybrid form, that bridged the gap between writing to learn and writing to communicate. In this blog, students could reflect on readings, describe and chart their progress on their projects, and explore or question their ideas; their writings were shared with other LENS students, who were encouraged to respond and create an ongoing dialogue. During the first week, students were given prompts for blogging, but were later encouraged to use the blog for their own purposes as they were completing their projects.

Finally, students were asked to write a two-page community action proposal that they would share with their home community. Each action proposal was to include the following: a well-defined community need related to sustainability, a project proposal to meet that need, a rationale, a needs assessment with a budget, research citations and descriptions of personal experiences to make their argument more cogent, a project ed time line, and a description of benefits. The students were challenged to write with precision, clarity, and persuasiveness. The purpose of the community action proposal, due at the end of program, was to persuade a specific audience to adopt a clearly delineated plan for more sustainable practices. To write such a readerly text, students would clearly need to demonstrate both their understanding of the challenges of sustainability and their rhetorical skills.

Information Technology and Literacy

All of the project groups were required to engage in background research on their areas of interest in order to gather evidence for their community action proposals. Though most had received some instruction on how to do library research, the LENS program provided most of the students with their first exposure to university-level research using several different databases and media formats. Library faculty were recruited to work closely with the LENS faculty members and their students, promoting information literacy and information technology skills among the LENS students.

Technology as a tool for learning was a key part of the program. Participating students had the option to either bring their own laptops or receive a loaner ThinkPad® from the Wake Forest University Information Systems Department. Students who did not bring a laptop with them had an introductory session with the librarians and then acted as peer instructors for the other students who had their own laptops, teaching them how to log in to the university’s network. All of the students participated in an information literacy session that focused on searching the library’s online catalog and electronic databases to find information on sustainability. One of the most important features of the library orientation was to familiarize the students with the library’s physical space, and the librarians accomplished this with a scavenger hunt. The students were asked to retrieve their assignment though Google...
documents, and were then divided into five groups, each with the title and call number of a specific resource related to sustainability.

**Discussion**

After two years of successfully implementing LENS, faculty and administrators recognize that there are numerous possibilities for universities to formalize their commitment to sustainability by offering innovative summer educational programs for precollege students. Through active learning activities and hands-on practical experiences, the students were given an opportunity to engage and collaborate on the topic of sustainability.

The writing part of the curriculum focused on preparing students for the transition from high school to college writing and introducing students to the concept of writing for a range of audiences and a variety of rhetorical purposes. While the faculty responded promptly to all formal and informal writings, the students’ prose was ungraded. We wanted to allow these high school students to discover how college faculty might respond to student ideas and prose style, but we also wanted them to feel free to explore new ideas and to communicate and persuade without fear of censure. Through their writing, Professor Boyle and her interns were able to track students’ understanding of the material, offer support in research, make suggestions on their group projects, push them to consider new ideas, and affirm their work.

Nearly all students suggested that the program improved their college writing skills and their ability to talk coherently about sustainability issues. Relationships with professors, resident advisors, and one another exceeded their expectations. Suggestions for next year’s program included a more concrete schedule and specific time dedicated to work on projects. Overall, most students felt encouraged to apply to Wake Forest University because of student research possibilities, its passionate and knowledgeable professors, and the exciting independence they found in a college-like experience. An unexpected outcome was that these visiting students gained the ability to navigate the college admissions process and function as a well-rounded member of a residential living community. As a result, of the 26 participants in LENS 2010, 11 applied to Wake Forest University and six were accepted. In 2011 there were 23 students enrolled in the program. To date nine, of those students have applied, with five accepted via early decision.

Based on exit interviews, we believe that the cocurricular activities were the most memorable for students. In addition, the majority of the final project groups seemed to find their work both personally and intellectually enriching, as evidenced by their strong desire to share the outcomes of their labor with each other and with their parents following the closing ceremony.

**Conclusion**

Education for Sustainability (EfS) has evolved from the study of the environment to a broader study of humans’ relationship with the environmental resources that support life on this planet. The growth and expansion of this field has created synergistic relationships between the life sciences, social sciences, humanities, and professional schools. Scholarship is crossing disciplinary boundaries to draw on the resources needed to craft answers to society’s most pressing challenges. Organizing principles, like problem-based learning, facilitate this cross-disciplinary work and illustrate the interconnectedness of knowledge and fields of practice.

EfS offers an opportunity for faculty to take the lead and develop innovative summer outreach programs for precollege students. Using a global issue such as sustainability, faculty from various departments across campus can collaborate to create bold adventures and learning activities that will engage high school students and promote college-level writing and oral proficiencies. Collaborative programs such as LENS demonstrate “how important it is to respect the unique aspects of context; to recognize that all participants have gifts and knowledge to offer; and to be open to new and sometimes profound learning episodes” (p. 59). The LENS program provided a small step toward providing college-level competency to a select group of high school students. Such educational outreach programs must become more commonplace if institutions of higher learning are to foster a 21st-century pedagogy that is based on cross-disciplinary collaboration, creative problem-based learning solutions, and sustainable living practices.

**Author Disclosure Statement**

No competing financial interests exist.

**References**


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