Considerations for Establishing an Interdisciplinary Sustainability Undergraduate Degree Program

Custom Research Brief

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THE ADVISORY BOARD COMPANY
WASHINGTON, D.C.
I. RESEARCH METHODOLOGY

Project Challenge:

Leadership at a member institution approached the Council with the following questions:

- Based on a review of sustainability undergraduate programs nationwide, identify which areas of focus are trending?
- Is the program interdisciplinary? What departments are involved with developing and delivering the program?
- What does the curriculum consist of? How was it developed and who was involved? For how long did faculty and administrators conduct curriculum development and planning? How and when are curricular elements adjusted or reconsidered?
- How many students apply to the program? How many are accepted? How have enrollment trends changed in the past few years?
- Is the minimum program enrollment met easily, or does the program proactively market to or recruit students? If so, in what ways?
- How long has the program been offered? How sustainable is the program?
- When the program was established, what evidence indicated there would be sufficient enrollment?
- When the program was established, how was the specific program focus determined?
- What career paths do program graduates pursue?

Project Sources:

- Climate Solutions (http://climatesolutions.org/cs-journal/white-house-report-sees-strong-growth-in-clean-energy-jobs)
- Education Advisory Board’s internal and online (www.educationadvisoryboard.com) research libraries
- National Center for Education Statistics [NCES] (http://nces.ed.gov/)
- The Association for the Advancement of Sustainability in Higher Education: http://www.aashe.org/resources/academic-programs-sustainability
I. Research Methodology

Research Parameters:
The council interviewed sustainability program directors at small, private baccalaureate and master’s institutions.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Location</th>
<th>Enrollment</th>
<th>Classification</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>University A</td>
<td>Northeast</td>
<td>3,000</td>
<td>Master's Colleges and Universities (larger programs)</td>
<td>Private</td>
</tr>
<tr>
<td>University B</td>
<td>South</td>
<td>3,400</td>
<td>Master's Colleges and Universities (larger programs)</td>
<td>Private</td>
</tr>
<tr>
<td>University C</td>
<td>South</td>
<td>2,300</td>
<td>Baccalaureate Colleges--Diverse Fields</td>
<td>Private</td>
</tr>
<tr>
<td>University D</td>
<td>Mid-Atlantic</td>
<td>3,500</td>
<td>Master's Colleges and Universities (larger programs)</td>
<td>Private</td>
</tr>
<tr>
<td>University E</td>
<td>Northeast</td>
<td>3,700</td>
<td>Master's Colleges and Universities (medium programs)</td>
<td>Private</td>
</tr>
</tbody>
</table>

Source: National Center for Education Statistics
II. EXECUTIVE OVERVIEW

Key Observations

 In 2009, the Association for the Advancement of Sustainability in Higher Education (AASHE) reported that over 100 majors, minors, or certificates were created in energy- and sustainability-focused programs at colleges nationwide, compared to three such programs created in 2005. The AASHE executive director attributes this to an increase in student demand and employer need for qualified candidates in this field.

 Of the 327 undergraduate sustainability degree programs (including majors, minors, and concentrations) currently identified by AASHE, more than 37 specific program areas are identified. Environmental Studies programs comprise one quarter of all programs, and Environmental Science programs comprise close to one quarter of all programs.

 Nationally, employment in renewable and clean energy, environmental science, and other green fields has experienced growth in recent years and is projected to grow in the future.
  • The Pew Charitable Trusts report 9.1 percent growth in clean energy jobs between 1998 and 2007; overall job growth increased only 3.7 percent during that time.
  • According to the American Solar Energy Society, the renewable energy and energy efficiency industries are projected to provide 37 million jobs by 2030.
  • The U.S. Bureau of Labor Statistics projects employment of environmental scientists to grow 25 percent between 2006 and 2016, and projects that ten percent of new jobs by 2038 will be green careers.
  • A 2009 report published by the White House Council of Economic Advisers projected that environmental-related occupations will grow 52 percent between 2000 and 2016, compared to a 14 percent growth in jobs overall.

 All contact institutions offer inter-disciplinary sustainability programs, incorporating courses from design, nutrition, science and engineering, politics and policy, ethics, economics, and business disciplines. Contacts developed the curricular and program focus of new sustainability programs to align with institutional strengths and available expertise, job market trends, and pre-existing degree programs. Sustainability programs at contact institutions rarely maintain dedicated faculty, limiting the number of course sections that may be offered and the number of students that may ultimately enroll in the major.

 Sustainability programs at contact institutions were launched between 2008 and 2011, and are still building enrollments; program viability is not typically evaluated based on enrollment in the first several years. Most contacts report about one to three students enrolling in the major in the first few years; enrollment has since grown to between four and 40 students across institutions.

 Contacts report that proactive marketing contributes to meeting enrollment goals, but have limited resources to dedicate to marketing; contacts enhance the program website, promote the program and relevant green jobs through academic and career planning offices, conduct mock lectures and discuss career paths with prospective students and their parents, attend prospective student open houses, and speak directly with students at high school recruiting events.

 Contacts report that program graduates may seek employment in environmental specific fields, such as environmental engineering, alternative energy and transportation, and community and urban planning; or in traditional fields in which a background in sustainability can be applied, such as public administration or marketing.
III. NATIONAL PRESENCE OF SUSTAINABILITY AND ENVIRONMENTAL DEGREE PROGRAMS

National Presence of Sustainability and Environmental Degree Programs

In 2009, the Association for the Advancement of Sustainability in Higher Education (AASHE) reported that over 100 majors, minors, or certificates were created in energy- and sustainability-focused programs at colleges nationwide, compared to three programs created in 2005. As reported by US News & World Report in September 2011, environmental studies and sustainability is one of nine “hot college majors” being established in growth fields. The AASHE executive director attributes this to an increase in student demand and employer need for qualified candidates. Of the 327 undergraduate sustainability degree programs (including majors, minors, and concentrations) currently reported by AASHE, more than 37 specific program areas are identified. The following program areas were most represented:

- 12 percent related to Environmental Engineering
- Eight percent related to Environmental Sustainability and Sustainability Studies
- 12 percent related to Sustainable Communities and Environmental or Urban Planning
- 25 percent related to Environmental Studies
- 23 percent related to Environmental Science
- Five percent related to Sustainable Agriculture and Agroecology

National Growth of Sustainability and Environmental Degree Program Enrollment

In recent years, some sustainability programs have experienced sudden growth in enrollments:

- In 2009, Arizona State University’s 18-month old sustainability studies major enrolled 600 total students.
- In 2009, Illinois State University enrolled 65 total majors in its year-old renewable energy program.
- In 2009, the Massachusetts Institute of Technology launched an energy studies minor; a student survey revealed that 43 percent of freshmen and sophomores were very or extremely interested in the minor.

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IV. ENROLLMENT TRENDS

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major Type*</th>
<th>Year of Program Launch</th>
<th>Number of Students Enrolled in First Year</th>
<th>Current Total Enrolled Students</th>
<th>Enrollment Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>University A</td>
<td>Sustainability</td>
<td>Fall 2011</td>
<td>One</td>
<td>Project at least four by Fall 2012</td>
<td>Ten new majors per year</td>
</tr>
<tr>
<td>University B</td>
<td>Three major options: Sustainability; Conservation; Environmental Management</td>
<td>Fall 2008 (Sustainability major) Fall 2010 (Two new majors added)</td>
<td>Information not provided</td>
<td>Total enrollment across the three majors has ranged from 13 to 23 since program launch.</td>
<td>50 to 75 total</td>
</tr>
<tr>
<td>University C</td>
<td>Environmental Sustainability</td>
<td>Fall 2010</td>
<td>Three to five</td>
<td>12</td>
<td>25 total majors (five to eight new majors per year)</td>
</tr>
<tr>
<td>University D</td>
<td>Environmental Sustainability</td>
<td>Fall 2008</td>
<td>Two to three</td>
<td>42</td>
<td>60 total majors</td>
</tr>
<tr>
<td>University E</td>
<td>Sustainability</td>
<td>Fall 2010</td>
<td>Information not provided</td>
<td>3 majors, 10 minors</td>
<td>Maximum of 25 to 30 new majors per year</td>
</tr>
</tbody>
</table>

*To maintain the anonymity of contact institutions, specific major titles are not provided.

Estimating Program Enrollments
During program development, contacts base enrollment projections on three factors:
- enrollments of other related majors on campus
- enrollments of similar programs at other institutions
- environmental and sustainability employment trends

Meeting Baseline Enrollment Requirements
Contacts report little pressure to meet enrollment criteria for new sustainability programs and an understanding with senior administration that initial enrollment would be low with gradual increases.

Institutional Commitment to Providing Sustainability Education
Contacts at University A report that the Vice President of Academic Affairs was supportive of the development of the sustainability major regardless of the projected enrollment because the program offering became an institutional priority as part of a broader sustainability goal. Contacts at University E also report that an institutional commitment to promoting sustainability awareness surpassed the need for evidence of sufficient enrollment when developing the sustainability program. Enrollment will be evaluated in the program’s fifth year of operation.
### IV. Enrollment Trends

#### Recruiting Challenges

<table>
<thead>
<tr>
<th>Students Lack Awareness of Sustainability and Environmental Fields</th>
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</thead>
<tbody>
<tr>
<td>Contacts report that sustainability is a relatively new field with which students and parents are unfamiliar. Contacts at University B report that the geographic area from which most students are recruited lacks a strong culture of environmental awareness, so students with a passion for the environment are rare.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parents and Students are Skeptical of Sustainability and Environmental Career Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contacts report that parents are especially concerned with job placement, are skeptical of a new major that cannot demonstrate an employment record for graduates.</td>
</tr>
</tbody>
</table>

#### Recruiting Program Participants

Contacts report that meeting projected enrollment has been challenging; lacking the means to launch extensive marketing campaigns, contacts report the following marketing efforts:

- **Recruiting Current University Students**
  - Undeclared students or transfers from other majors or colleges within some contact institutions comprise many of the sustainability program majors; few students intend to enter these programs as first-years—most enroll in the program after consideration of other majors or discovering an interest in sustainability in their first and second year.

- **Collaborating with University Offices**
  - **Admissions Office: Presenting the Major to Prospective Students**
    - **High-School Visits**
      - Contacts at University E report that the admissions and marketing offices both actively market the program to prospective students. The Director of the Sustainability Major also coordinates with the admissions office to present at high schools and on-campus recruiting events.
    - **Promotional Videos**
      - Contacts at University A also coordinate with the admissions office; rather than traveling in person to high schools, the sustainability Program Director recorded a promotional video for admissions officers to share with prospective students and post on the college website.
    - **Mock Lectures**
      - Contacts at University C coordinate with the admissions office to conduct mock lectures for prospective students and parents during scheduled visitation days.

- **Career Planning Office: Promoting Green Jobs**
  - Contacts at University C coordinate with the career planning office to promote green jobs and build relationships with green employers. Because students are often unaware of the career options that proceed from a sustainability major, visibility of green jobs helps inspire confidence in the major.

- **Encouraging Awareness through Community Events**
  - The sustainability Program Director at University A promotes the major by presenting at community and statewide sustainability-focused meetings. The sustainability Program Director at University D attends environmental fairs and green career days to promote the program, and has also advertised in a free local sustainability magazine that is distributed at local organic food stores.

- **Increasing Online Program Presence**
  - Contacts at University C report that funds for marketing efforts are limited, but have enhanced the program website and increased its visibility by linking to other university websites. Contacts at University D increased visibility of their program website through a Google AdWords campaign.
## Overview of Program Development across Contact Institutions

| University A | **Impetus:** The Vice President of Academic Affairs charged the Director of the center for sustainability in the community with the development of a sustainability major.  
**Organizers:** The current sustainability Program Director led the development of the current curriculum.  
**Timeline:** Program development occurred over eight years; the process was elongated by multiple iterations of curriculum plans and approval from curriculum committees and the state Department of Education. |
| University B | **Impetus:** Two new majors, which focus on conservation and ecology and environmental management and technology, were created to accompany the sustainability major and increase overall enrollment. The original sustainability major was launched to build upon the success of graduate sustainability offerings.  
**Organizers:** Initially, faculty collaborated on a pilot sustainability program. However, due to resistance from the faculty, program development was reassigned to the Executive Director of the center for sustainability and several contracted field experts. |
| University C | **Impetus:** Due to low enrollment in the former environmental studies major, the Board of Trustees and senior management team mandated revisions to the program, which transformed into an environmental sustainability major.  
**Organizers:** The program coordinator, along with faculty across related departments, developed the proposal and curriculum for the new major.  
**Timeline:** According to deadlines set by the Board of Trustees, the new program was developed in one month. |
| University D | **Impetus:** Contacts report that the environmental sustainability major was developed to train students for a sustainability leadership career path, and to complement the existing environmental conservation biology major.  
**Organizers:** The program director and various faculty were involved in the development of the program and curriculum.  
**Timeline:** Program development occurred over two years. |
| University E | **Impetus:** Sustainability and environmental education had become an increasing institutional priority.  
**Timeline:** With the support from senior administration, deans, and faculty, the program was developed in only nine months. |

## Considerations

| Faculty Willingness to Collaborate on Interdisciplinary Curriculum | Because of the interdisciplinary nature of any Sustainability or Environmental major, contacts emphasize the importance of faculty willingness to collaborate across departments and tailor course content to the major. |
| University and Faculty Commitment to Sustainability | Contacts also emphasize the importance of an institutional commitment to promoting sustainable behavior on campus. Furthermore, contacts emphasize that faculty who instruct the major courses practice the principles they teach. |

“Sustainability is fundamentally a personal discipline that has to be practiced by the people teaching it.”  
— Council Interview
### VI. PROGRAM CURRICULUM

#### Determining Program Focus

**Institutional Priorities**

Programs are often designed to align with institutional culture and goals. Contacts at University A describe an increasing institutional focus on both globalization and local volunteerism. These priorities are reflected in the specific focus of their sustainability degree program.

**Institutional Capabilities**

When determining program concentrations, contacts consider what specializations can be supported by the current infrastructure of the institution (e.g., contacts at University A considered a historical and cultural preservation track, but did not have the expertise to offer such courses within the college).

**Unique Program Focus**

Contacts at University E thought it impractical to simply duplicate a program that has a successful history at many other institutions without incorporating unique or new program components.

**Industry Trends**

**Desired Skills**

University B replaced an Environmental Science major with a sustainability major; contacts observe an increasing demand for graduates equipped to problem solve, rather than merely assess, environmental issues (assessment was the focus of the former Environmental Science major). However, the core of the Environmental Science curriculum was maintained, particularly for its technology-based approach to environmental issues. Contacts at University C observe a demand for strong written and oral communication skills among employers with available green jobs. This demonstrated need, combined with the institution’s strength in communication education, influenced the addition of communication as a foundational area of the curriculum.

**Trending Occupations**

Contacts at University C, University D, and University E report that the curriculum was based on green job trends and on the skills and education candidates require for success in those career paths.

- Contacts at University E witnessed demand for candidates with a background in sustainability and the skills to communicate that knowledge effectively. Contacts also witnessed demand in municipal government for candidates with a background in sustainability and public policy, and demand among corporations for candidates with a background in sustainability and management skills.
- When contacts at University D were developing their program in 2006, they witnessed an increase in sustainability leadership positions, and an absence of degree programs that prepare students for those roles.
VI. PROGRAM CURRICULUM

Curricular Components

Disciplines
Across contact institutions, sustainability and environmental majors are interdisciplinary and draw from the following fields:

- Engineering and Technology
- Business
- Humanities
- Biological, Physical, and Social Sciences
- Mathematics
- Economics
- Communication
- Nutrition
- Architecture and Design
- Ethics
- Politics and Policy

Structure
Across institutions, major requirements are generally fulfilled by a combination of core and elective courses.

- At University C, 18 to 19 credit hours of core courses are required for the sustainability major; at University A, students complete 33 credits for the sustainability major.
- Across contact institutions, core courses may include: Environmental Science, Environmental Resources, Environmental Ethics, Environmental Politics and Policy, Environmental Economics, Environmental Chemistry, Sustainable Communities, Sustainable Design, and Ecology.

Concentrations
Within the Sustainability major at University E, the following concentrations are available: International Development, Communication, Public Administration, and Management and Marketing.

Revisions to Program Curriculum
Contacts note that ongoing changes will be made to current program curriculum to accommodate the shifting economy and job market and to address student feedback. Some potential adjustments include additional concentrations, a senior capstone course, and additional technical training (e.g., Geographic Information Systems and greenhouse gas inventory).
VII. EMPLOYMENT AND MARKET TRENDS IN SUSTAINABILITY AND ENVIRONMENTAL FIELDS

Statistics and Trends in the Green Economy

Sustainability and environmental programs can prepare students for careers in a range of “green” fields. Some of these fields, including renewable and clean energy and environmental science, have experienced growth in recent years and are projected to grow in the future.

- The Pew Charitable Trusts report 9.1 percent growth in clean energy jobs between 1998 and 2007; overall job growth increased only 3.7 percent during that time.\(^3\)
- According to the American Solar Energy Society, the renewable energy and energy efficiency industries are projected to provide 37 million jobs by 2030.\(^4\)
- The U.S. Bureau of Labor Statistics projects employment of environmental scientists to grow 25 percent between 2006 and 2016, and projects that ten percent of new jobs by 2038 will be green careers.\(^5\)
- A 2009 report published by the White House Council of Economic Advisers projected that environmental-related occupations will grow 52 percent between 2000 and 2016, compared to a 14 percent growth in jobs overall.\(^6\)

Potential Career Paths for Sustainability and Environmental Program Graduates

Program graduates may pursue “non-green” career paths to which they may apply their background in sustainability or environmental studies. Contacts at University E note an increase in jobs in public administration and marketing that require a background in sustainability. In describing potential career paths to prospective students, contacts at University A explain that the major prepares students to apply a unique environmental perspective to traditional jobs in business, education, and health care, among other industries. Similarly, contacts at University B advise students to integrate their sustainability training into any existing profession that interests them, and encourage them to simultaneously pursue undergraduate education in that discipline as well. For example, a sustainability major interested in marketing is encouraged to take business courses and possibly double major in marketing to prepare for a role that required a background in both marketing and sustainability education.

Students may also pursue careers specific to sustainability or environmental fields, such as:

- Engineer
- Environmental consultant
- Energy efficiency analyst
- Operations manager
- Project manager
- Development specialist
- Resource manager
- Carbon broker
- Environmental educator
- Eco-tour guide
- Sustainability manager
- Sustainability analyst
- Sustainability coordinator
- Sustainability consultant
- Sustainable design professional

However, contacts note that some of these positions are not entry level and may require years of experience or an advanced degree. Contacts at University C report that the most popular fields program graduates pursue are Environmental Engineering, Sustainable Energy and Transportation, and Community and Urban Planning.

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