Teaching Sustainability 101: How Do We Structure an Introductory Course?

A panel discussion at the 2012 Association for the Advancement of Sustainability in Higher Education (AASHE) conference brought together five faculty members who have each taught a version of an Introduction to Sustainability course at their respective universities. Through a series of questions about learning objectives, experiential learning, assignments, and course materials, the panelists share their experiences and explain their practices for introducing students to the concept of sustainability.

Tom Schrand: *What are essential objectives for Sustainability 101?*

Geoffrey Habron: Our sustainability specialization is a competency-based program and we have eight competencies that we work on. Our introduction to sustainability course is based on those eight competencies. Like a lot of people who do sustainability, we have the triple bottom line, so students are required to understand the role of ecological integrity, economic vitality, and social equity. Then we've added aesthetic understanding as the fourth one, and so those are what we call our content-area competencies, because you would have a discipline or a major in those four. In addition, we have four process-based competencies, which are civic engagement, systems thinking, critical thinking, and personal development. So those are the eight that we focus on throughout the specialization and certainly we do it in the course, and then the course also talks about the role of multiple modes of inquiry because our specialization is portfolio-evidence based, so we're trying to get students to recognize that there are multiple modes of inquiry and evidence to demonstrate their learning.

We developed those competencies in conjunction with a set of faculty. We then conducted gatherings with faculty teams who identified seven to eight learning tasks for each of the eight competencies. So we distribute those throughout our introductory course.

Lindy Biggs: When I think about teaching introduction to sustainability, my major concern is that students leave the class with a solid understanding of what it is, so that when asked, "Oh, what is sustainability anyway?" they can answer that. In order to help them, and they struggle with it—I think many of us still struggle with a nice concise answer to that question—my objectives are to give them a broad-based introduction. I want them to understand that sustainability is, at its very core, interdisciplinary.

I also emphasize systems thinking; we do a lot of work to help students understand how to apply systems thinking. They're not going to be able to draw those big, complex systems maps by the time they're finished with the course, but I want them to understand interconnectivity. That, for me, is a key objective of the course. Like Geoff, I also want them to understand individual and social actions; we have exercises that ask students to explore what they do as individuals that contributes to, or detracts from, a sustainable world, but then we emphasize that it is not just individual actions. We have materials to help them understand the bigger picture—politics, policies, institutions, infrastructure, and of course cultures.

And finally, for me, critical thinking is a key to every class I teach. Through the interdisciplinary work, the systems thinking, and the individual and social actions piece, they are naturally learning to become critical thinkers. I am more interested that they learn to ask good questions than to give me good answers, because if you can't ask good questions, you won't ever get good answers.

Lisa Benton-Short: To design the undergraduate sustainability minor, we assembled a faculty committee—26 faculty from nine of George Washington's (GW) schools, including several graduate-only schools such as education and law. Initially, I thought designing the minor would be a challenge, since sustainability means different things in different disciplines. But the process became incredibly creative, collaborative, and far more innovative than I could have imagined. For example, the committee recommended that the

Moderator
Tom Schrand, PhD
Associate Academic Dean, College of Science, Health and the Liberal Arts
Philadelphia University, Philadelphia, PA
Program Director, B.S. in Environmental Sustainability
Course: SUST 100: Introduction to Sustainability

Participants
Lisa Benton-Short, PhD
Interim Director, George Washington Institute for Sustainability
George Washington University, Washington, DC
Academic Program Director for Sustainability
Course: Sustainability 1001: Intro to Sustainability

Lindy Biggs, PhD
Associate Professor, emerita. History
Auburn University, Auburn, AL
Founding Director, Office of Sustainability
Course: SUST 2000: Introduction to Sustainability

Michael Bryson, PhD
Sustainability Studies Program Director
Roosevelt University, Chicago, IL
Course: SUST 210: The Sustainable Future: Environment, Economy, Equity

Geoffrey Habron, PhD
Director, Sustainability Specialization
Michigan State University, East Lansing, MI
Course: ACR 187: Introduction to Sustainability

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— Michael Bryson

introductory course be team-taught by faculty from different schools and disciplines. This came about when we began to conceptualize the learning objectives and it became clear that conveying the notion of interdisciplinary thinking was critical; the idea of a team-taught introductory course was compelling. And it seemed logical.

Currently our Introduction to Sustainability is team-taught by five faculty from five different schools. This has exposed students to the complexity and diversity of sustainability because we each approach sustainability theory and research very differently. Another way the course highlights the interdisciplinary nature of sustainability is that throughout the semester, we include panel discussions that involve the five faculty teaching the course as well as several external experts from government, business, and nonprofits. The panel discussions help expose students to looking at an issue and having very different interpretations of both the problems and the solutions. Our experience at GW shows the innovation that comes from a diverse and committed faculty collaborating together.

Tom Schrand: *What role does experiential learning play in your course?*

Michael Bryson: One of the joys of teaching sustainability is getting out in the field, connecting readings and class discussions with experiences beyond the classroom, meeting experts where they do their work, contributing to community projects—in other words, getting out of the classroom and engaging in experiential learning.

One way we do this at Roosevelt in our introductory The Sustainable Future course is the integration of field trips within the urban and suburban environments, which effectively uses Chicago and its suburbs as a kind of outdoor learning laboratory. Students explore important cultural and/or architectural sites, hear from experts in the field, study notable natural areas, learn about the work of nonprofit organizations, contribute labor to urban farms, clean up beaches or waterways, etc.

A second way I've incorporated experiential learning within my introductory courses is in community-based research projects, such as what we did in the spring of 2012. This was a multi-college collaboration with several nonprofits in finding and mapping sustainability initiatives and assets in all of Chicago's 77 community areas. The project was an effective and eye-opening experience for students, most of whom were exploring the city's neighborhoods for the first time, and it inspired several of them to continue their work with our community partners in subsequent months. The pedagogical idea here is to connect classroom learning activities to what is actually being done in the city and suburbs at a community level to study and promote sustainability.

Lisa Benton-Short: When we were designing the sustainability minor, we agreed that there should be an experiential learning component to the minor. We created a capstone experiential learning component. Sustainability minors select among several options: an internship, community service, or a directed research project with a faculty mentor. The idea is to take sustainability from the classroom into the community. Whatever project the student selects, throughout that semester they complete a series of reflective essays that prompt them to make deeper connections between what they have learned in the classroom and what they learned from their own experiences in the real world.

Because our large introductory course has 100 students, we do not yet have an experiential learning component; there is a significant challenge to organize and coordinate a meaningful experience in such a large introductory class (for both the community partner and the student). In the meantime, at the heart of this introductory class is a purposeful engagement with community and self. This is because sustainability issues require discussing personal behavior (consumption patterns) as well as the responsibility of engaged citizens at various scales (local, regional, national, global) to respond to these critical issues. One of our goals is for the course to foster a deeper sense of civic responsibility and to encourage engagement in the democratic process.

When possible, we take larger topics, such as water pollution, and focus on regional or local issues. For example, in our water unit, we had a panel discussion featuring several external experts from the EPA, Potomac Riverkeepers, and the Chesapeake Bay Foundation, who discussed the various obstacles to a cleaner bay. Our aim with these panels is to introduce diverse perspectives in deciding whether and how to act around critical social and environmental issues. These panels also expose students to the challenges facing local and national civic institutions such as nonprofits and federal agencies.

Finally, students are challenged to design and create a three- to five- minute video that outlines a problem and provides a solution. Students are encouraged to think at all scales—from a campus issue, to the DC metro region, to a national or global issue. This assignment challenges students to propose an intervention or a solution based on broader theoretical knowledge and how it is connected to sustainability.

Geoffrey Habron: We use Kolb's experiential learning model, so that's what drives what we do.[1] There are four basic stages or phases in that: coming up with abstract concepts, doing something concrete, reflecting on that, and then applying or testing that in a new situation. So our course is based on that model and we have a nested series of experiences that relate to that.

Each of the classes has two major field visits—ours are based on campus. For the first one, they'll go to the surplus and recycling center and get a tour, or if they are focusing on energy, they'll go to the campus power plant and get a tour. Then they will develop a systems diagram based on their understanding of that. The second trip for the recycling center is a waste sort, so we'll get a dumpster from one of the buildings, it gets spilled out on the surplus and recycling floor, and they actually get to pick through and figure what percentage of the waste stream should have been recycled.

In the case of the energy system, they'll do a computer simulation that enables them to figure out how much energy we could get from hydro, photovoltaic, etc., compared with the demand that we have, and then they revisit their diagram accordingly. Their second exam is a project proposal because they are supposed to understand the system on campus and then make a proposal to intervene in the system. By the end of the course, they have engaged in a project that facilitates the improvement of sustainability in the campus system, and it has to fit the system's properties, but [it's also] also civic engagement by working with campus partners.

Tom Schrand: *What textbooks and materials do you use?*

Lindy Biggs: I use different materials every time I teach because, as a teacher, the worst thing that I can do is to get bored, but there are a few things that I use consistently. I like to start the semester with Annie Leonard's *The Story of Stuff*.[2] It's engaging, easy to watch, and a good vehicle for introducing systems thinking to students, as it moves from the personal to the global, making strong connections between our lifestyle and health of the rest of the world.

I also use chapters from *Natural Capitalism*; some of the book is dated by now, but many of the chapters are timeless, and it is still one of the best introductions to sustainability.[3] The book is free online—students love that. One year I got a phone call from an environmental engineer whose daughter was in the class. He called to thank me for this class that had so excited his daughter and also to appreciate the fact that all of the readings were online. He said, "You're really demonstrating how to use natural resources better."

The *Solutions* journal is a good source for short, timely articles. I use an article from it about a program that addressed poaching in Zambia. It was a brilliant systems example; it was also short and powerful. So we start with *Natural Capitalism*, they read articles about current issues, so that they understand that this is a dynamic field. I look for readings that focus on problems and their solutions to engage the students.

I show a number of films; *Food, Inc*. is a standard. On our campus, two years ago it so excited students in the class that they formed a Real Foods chapter, which is making some major changes. We use TED Talks, there's so much there and they are twenty minutes and hard-hitting.

Tom Schrand: This past semester, I used a book called *Choices for Sustainable Living* from the Northwest Earth Institute; it's organized into "sessions," which each set up a different discussion event. Each session has a series of short, journalistic-style articles, along with a set of questions designed for small-group discussions. Students read a chapter, and then we divide up into groups in class. Students take turns as group leader and they use the provided questions to guide the discussion. These sessions have really been empowering to students; it gives them a sense of autonomy over this part of the course. After using these discussions as an overview of a topic, we can dig deeper in subsequent classes with additional materials.

I've used another book for several years now: *Ecotopia*, the novel by Ernest Callenbach.[4] I like to read it toward the end of the semester, because it gives us a vision of a full-blown sustainable society, and whether you like it or not, you can look at it and say, "OK, these are the pieces that they are putting together, this is how it works, these are the values at the foundation of it." Then it becomes a heuristic device: Do we like this vision, is it a better society than our current one, or would we feel like we are sacrificing something for it? We can step back and ask: What would a truly sustainable society look like? From there, you can think about the gap between what *Ecotopia* is doing and where our society is and start to map out the steps would it would take to move in this direction. The students seem to enjoy the book, and I find it a very effective way to wrap up the semester.

Tom Schrand: *What projects and assignments have proven effective?*

Michael Bryson: One project I've worked on with several introductory sustainability classes is a website/blog entitled Schaumburg's Sustain-

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able Future.[5] The initial idea was to have students engage in a writing and research project that was going to do more than just generate a stack of paper at the end of the semester, but instead something that could actually have legs, that could be more multi/social media-driven, that could be used in turn as a kind of teaching tool in and of itself, and that would connect the analysis of sustainability issues that we were doing in class with the on-the-ground concerns of our community in the northwest suburbs of Chicago (where our university maintains one of its campuses).

Starting in the spring of 2011, student research teams investigated sustainability issues of great relevance to urban and suburban areas, like water, park lands, biodiversity, corporate social responsibility, energy, land use, transportation, etc. In that and subsequent semesters, we built this site out to function as a university and community informational resource as well as a critical voice about how well the suburb of Schaumburg, Illinois, is doing in terms of working on its present (and future) sustainability.

Starting in spring 2012, students began contributing blog essays to the site. This has multiple benefits: Students can gather info and try out ideas as they are taking shape in their writing and research during the semester, which benefits their work on their end-of-semester research projects. From my standpoint as the site's editor, I receive fresh content every week to make the site more dynamic and interesting. My students and I are continuing this work now in the spring of 2013.

Lindy Biggs: I want students to know how to write and to read critically so I create assignments to build those skills. They write critique papers on readings over the semester; they hate it but by the end of the semester, they are on target.

Early in the semester they look at their ecological footprint; everyone has to reveal their footprint and some of them are a little embarrassed. I had one young woman who had a footprint of 11 planets—she made a point of doing something about that during the semester! We talk about foot-printing because it's a nice tool to use throughout the semester. They do another footprint at the end of the semester. I ask them to experiment: what happens if you eat differently, leave your car at home? They are amazed at how their footprint changes when they stop driving to campus and eat less meat. They analyze their new footprint and explain why it has changed, and then they have to embed that in the country's footprint. It's a nice opportunity to talk about systems again, that they are part of the system that makes their footprint big, and they get that. We talk about politics, policy, and institutional behavior to make the point that achieving sustainability isn't only in individual behavior.

The final project that I like best is an examination of the footprint of a food or an object that they use in their daily life. They've done a pencil, toothpaste, a cup of coffee, a Bic pen, a water bottle, a skateboard, and more. The assignment is to look at the production, how long it's used, and its disposal. In addition to the paper, they create a poster for a poster session. Everybody is looking at these posters and saying, "Wow, a cup of coffee takes that much water and that much transportation?" It reinforces the point that everything we do, every choice we make has an impact.

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