
LONG-TERM IMPACTS OF FACULTY DEVELOPMENT PROGRAMS

THE EXPERIENCE OF TELI AND PIEDMONT

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Abstract. A long-term study of two faculty development programs on sustainability and the environment reveals enduring changes in teaching, research, interdisciplinary collaboration, and engaged action. Participants in cohorts of Tufts University's Environmental Literacy Institute (12–16 years ago) and Emory University's Piedmont Project (1–5 years ago) reported substantial numbers of new and renovated courses and multiple innovations in teaching methods. Results included new interdisciplinary research, grants, and publications; expanded knowledge and practical action; and strengthened collegial community connections with the natural world.

Keywords: *curriculum, environment, faculty development, sustainability*

In the changing world of higher education, long-term impact of faculty development programs is often difficult to gauge. Sixteen years after its initiation, the Tufts Environmental Literacy Institute (TELI) created a legacy of a vibrant intellectual community from the first five

years of its existence. On a visit to Tufts University in the fall of 2006, Peggy Barlett learned that despite the twelve years that had elapsed, a group of 70–80 faculty are engaged in environmental issues, and the university now offers twenty-one different environmental degrees. Said one faculty member of the remaining TELI alumni, "It's quite an amazing group."

My participation in TELI was one of the best experiences I've had at Tufts, both in terms of my connections to many Tufts colleagues and my level of awareness of environmental issues. It fundamentally changed the way I view the world.

A similar faculty development program at Emory University, the Piedmont Project, also infuses sustainability and environmental issues across the curriculum. A study after five years found wide-ranging impacts on teaching, research, interdisciplinary collaboration, and intellectual community. One participant said it was the "[b]est faculty development experience I have been involved in at Emory."

This study demonstrates that a week-long, or even a two-day-long faculty development workshop can have surprisingly robust effects on university life and faculty members' work. Evidence suggests that teaching is affected—both with new topics and new teaching methods—but also faculty research, interdisciplinary cooperation, and personal engagement with environmental issues are enhanced.

Although interdisciplinary collaboration and pedagogies of engagement are current faculty development buzzwords and meeting the daunting challenges of sustainability galvanizes broad sectors of the academic community, not just faculty, long-term measurement of program impact is rare (Bergquist and Phillips 1975; Centra 1978; Erickson 1986; Scigliano 1978; Sorcinelli et al. 2006). To explore what effects on substantive knowledge, teaching, and research, if any, participants attribute to their experiences with the two programs, faculty were requested to complete a short e-mail survey¹ (see appendix). In addition, respondents were asked about possible effects

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on their perception of community, personal action, and engagement with place.

The comparison of the Tufts Environmental Literacy Institute (TELI) and the Piedmont Project is useful for several reasons. First, the TELI responses illuminate what impacts are reported over a decade after a project has been discontinued, a rare insight into such long-term effects. Second, both projects used somewhat different teaching methods, although their goals—enhancement of environmental and sustainability issues in the curriculum—were similar. Third, the robust quality of responses suggests that investment in faculty development efforts can have important outcomes for research innovation, interdisciplinary dialogue, and university quality of life. Finally, as higher education seeks to respond to the global imperatives of the environmental crisis, expectations that faculty can integrate environmental and sustainability issues in the curriculum entirely through self-education is probably unrealistic (Cambins and Steger 2000). Resource allocation can benefit from some assessment of ways to accelerate collegial commitment to renewal and change (Palmer 1998; Wergin, Mason, and Munson 1976).

Background on TELI

TELI, launched in spring 1990, was designed to develop capacity for environmental teaching and curriculum development. The concept was drawn from earlier computer literacy initiatives and based on the assumption that knowledge about the environment was just as important to students as knowledge about computer use. People at Tufts whose research and teaching focused on the environment were selected to act as coordinating faculty, and others were identified as participants. Although the vast majority of participants were faculty, some staff members also participated. TELI was held for five years and after the initial year, it included participants from other institutions, a few of whom were university faculty from developing countries.

In the program's first year summary, Anthony Cortese (1990c), Dean of Environmental Programs, noted that

Tufts University has embarked on an ambitious program to develop the intellectual capital that is needed to meet human needs

and many of our wants in an environmentally sustainable manner in the future. This program seeks to have all graduates of Tufts University—in the college of liberal arts and engineering, the schools of medicine, veterinary medicine, dentistry and nutrition, the Fletcher School of Law and Diplomacy and the graduate school of arts and sciences, be environmentally literate and responsible citizens. (1)

The summary articulates the following program goals:

Our goal is to provide Tufts graduates with a fundamental awareness and understanding of the importance of the natural environment to life, how all human activities affect the environment, and an ethic for responsible stewardship of the planet's resources.

To achieve this goal, TELI will hold a series of workshops, seminars and other programs to develop and augment the environmental knowledge and skills on the Tufts faculty, as well as to assist them in revising their curricula to include environmental issues. In this way, students will receive broad, continuing and repeated exposure to environmental issues throughout their academic experience. The institute will facilitate the process of faculty development by providing financial and intellectual support, as well as access to resources, information and environmental experts. (Cortese 1990c, 3)

Faculty in the program were expected to participate in a week-long workshop in the spring, to work over the summer developing new courses or modifying the content of existing courses to include material related to the environment, and to come together again to report progress made in August. Each received a modest stipend. For example, Professor Downing Cless, a 1990 participant from the drama and dance department, made a postworkshop commitment that

Environmental literacy will be used as the content base for two acting courses. In both, acting is being taught, but environment is the topic or theme for many in-class exercises and homework assignments (e.g., personal story telling, scenes from existing plays, and selected readings about the environment). (Cortese 1990b)

Professor Cless subsequently wrote and produced an Eco-Cabaret that enjoyed popular acclaim in the Boston area.

Topics for the initial 1990 TELI workshop were:

- Environmental problems associated with food production and consumption

- Solid waste generation, treatment and disposal
- Global climate change
- Habitat change and biodiversity
- Definition of environmental literacy at Tufts. (Cortese 1990a, 5)

Teaching methods included case studies, computer simulations, scientific demonstration, role playing, focused writing, group projects, field trips, and team teaching. Participants were given a reading packet for each topic that was designed to facilitate inquiry beyond the workshop. For example, in one year the session on environmental problems associated with food production and consumption had ten readings, of which half were articles from *Science*. The remainder were diverse and included Senate testimony, a nongovernmental organization report, and a newspaper article. There were thirteen additional readings for the session that included articles from *Epidemiology*, *Environmental Health Perspectives*, *Health and Environment Digest* as well as book chapters and articles from popular magazines (Cortese 1990c).

TELI was funded by the Environmental Protection Agency and corporate grants, and in part because of the corporate role, the program received an award from President George H. W. Bush in a Rose Garden ceremony at the White House in 1990.

Background on the Piedmont Project

The Piedmont Project was brought to the Emory campus and adapted from the Ponderosa Project at Northern Arizona University (Barlett and Eisen 2002; Eisen and Barlett 2006). Offered for the five years previous to Piedmont, the Ponderosa Project had been inspired by the work of Cortese at Tufts and by other environmental-sustainability workshops around the country (Chase and Rowland 2004; Cortese 1992). In the first two years, leaders from Northern Arizona University came to Emory to facilitate the opening two-day workshop and in subsequent years, Emory faculty provided workshop leadership.

Faculty apply to the program on the basis of a proposal to develop a new course or a new module of an existing course. Each year cohorts of twenty are accepted (some years a few administrators

or librarians are also included). The program follows a similar schedule to TELI's, beginning with a workshop, course development or revision over the summer, and an August one-day field trip and discussion session on the work. Participants also commit to sharing their intellectual process and teaching experience at a follow-up dinner in March. Faculty are paid \$1,000 on completion of a revised syllabus.

Preparatory materials for the workshop have varied from year to year, but have always been less substantial than the TELI approach. The goal of Piedmont Project readings has been less to bring faculty to familiarity with environmental literacy than to stimulate the imagination around possible issues that might connect with each person's field. For example, one year six short articles were distributed—an introduction to the biological-ecological approach, an anthropological perspective on sustainable fisheries in Central America, a nature poem, a news piece on toxic contamination in Alabama, a report on student efforts at the University of Wisconsin, and a study of the health impacts of global warming. The readings aimed to illustrate economic, environmental, and social dimensions of sustainability, as well as to highlight different professional engagements with sustainability issues.

In addition to readings, the workshop itself included four or five resource persons who lectured for about a half hour each. The presentations included an introduction to the ecology of the Piedmont region, health implications of urban sprawl, environmental justice issues in Atlanta, an ethnomusicologist's approach to music and the environment, and an overview of Emory campus sustainability efforts, to provide possible connections for course exercises and student projects. The Piedmont Project includes an abundance of new information and small group discussions and two woods walks that foreground experiential learning outdoors.

Leaders see their role as facilitating cross-fertilization among the people in the room—all of whom are “the experts”—and not just with the presenters. Although the Piedmont Project does not ask for a well-developed group project as TELI did, it does have one exercise where small groups

work intensively together and then present their results to the rest of the group. Conversations at lunchtime and breaks—and a book table of possible resources shared by participants—build collaborative connections across fields. Participants have been drawn from Emory's liberal arts undergraduate colleges, the graduate school of arts and sciences, and all six professional schools (Business, Law, Medicine, Nursing, Public Health, and Theology). Departments involved include languages, mathematics, chemistry, biology, sociology,

56 (the balance are no longer at Tufts). We sent surveys to all 56 and received 32 completed surveys between winter 2006 and spring 2007 (57 percent). This level of response probably results in some skewing of the TELI data toward those for whom the project had a larger impact; those who do not even remember the project were less likely to respond. However, our response rates exceed those of many faculty development assessments, and we did receive a wide range of responses from the TELI group.

FACULTY APPLY TO THE PROGRAM ON THE BASIS OF A PROPOSAL TO DEVELOP A NEW COURSE OR A NEW MODULE OF AN EXISTING COURSE. EACH YEAR COHORTS OF TWENTY ARE ACCEPTED (SOME YEARS A FEW ADMINISTRATORS OR LIBRARIANS ARE ALSO INCLUDED).

anthropology, political science, English, comparative literature, journalism, women's studies, religion, philosophy, classics, art, theater, and music.

At the time of this writing, the Piedmont Project has completed six years and has funding for four more. The Piedmont Project has been funded by different Emory units in different years, including three teaching innovation funds, the Program in Science and Society, the office of the Provost, Emory College's Center for Teaching and Curriculum, and contributions from the deans of individual units.

Research Methods

Materials on TELI and contacts for past participants were obtained from the Institute and included an Executive Summary (1990), a list of program participants covering 1990–92, and workshop notebooks for 1993 and 1994. A full list of Tufts-affiliated program participants was constructed from these sources. Information on participants from other institutions was unreliable and they were excluded from the study. Of the 111 Tufts people on the TELI participant list, we had functional e-mail addresses for

For the Piedmont Project survey, all past participants had known e-mails and were contacted. The responses received from the administrators and librarians were excluded from analyses of research or teaching questions. Of the 90 participants in the first five years, 75 responded to our e-mail request for information (83 percent). Looking at the patterns of nonresponse, we see no particular patterns among those known to be senior or junior faculty, area of expertise, or known attitudes toward the program.

The quotes used in this article were chosen from the full range of comments to be both illustrative and representative.

Findings: Impact on Teaching

It was transformative for me as a scholar . . . the two-week workshop² was a very intensive yet thorough education in environmental studies. (Tufts)

Though it was 15 years ago, I still remember many of the TELI presentations and I look back fondly on the field trip to Crane's Beach. (Tufts)

[The Piedmont Project] has the potential to effectively change existing paradigms in teaching and learning. (Emory)

We explored several different kinds of impact that TELI and the Piedmont Project might have had on teaching: numbers of courses changed, the kinds of course innovations, and the overall impact on teaching. Based on the surveys we received, a total of 96 courses at Emory and 44 courses at Tufts were developed or modified in their content or teaching method as a result of the program. Of these, 21 at Emory and 4 at Tufts were completely new. The combined enrollments in these new and renovated courses was substantial: nearly 3,000 students at Emory and over 1,500 students at Tufts. Of the 96 new or renovated courses at Emory, 81 were reported as regularly offered at the time of the survey, annually affecting the classroom experience of 2,620 students. Among the Tufts respondents, 41 out of the 44 courses were offered regularly, affecting 1,540 students each year. Of the total courses changed, 63 percent at Emory were undergraduate and 57 percent were undergraduate at Tufts. The rest were either graduate courses or combined undergraduate and graduate.

Although faculty participants commit to working on only one course, many reported the impact of the program led to changing more than one. A total of 39 percent of the Emory participants reported teaching two, three, or four either new or renovated courses. At Tufts, a full 50 percent changed more than one course. For administrators who wonder how many faculty participating in such development programs in the end teach no new or changed courses, our survey suggests between 7 percent (Emory) and 20 percent (Tufts; see table 1).

The seven individuals from Emory who reported teaching no new or renovated courses had all developed new

syllabi, but were unable to teach them by the time of the survey, usually for reasons of departmental need, although in some cases from changes in job description. TELI faculty tended not to list courses taught briefly long ago, and generally reported courses still in their active repertoire. These results suggest that a modest program commitment up front can have a much larger payoff in curriculum renovation, once a faculty member becomes familiar with new materials and issues. We also note that it is not essential to have a commitment to a “new” course to get new courses stimulated by such programs. Often, intellectual excitement generated by a modest change, such as a new course module, led to much larger innovations.

Varieties of Teaching Innovation

The Piedmont Project gave me the confidence to create a student project that tasks the students with identifying and then taking a concrete action to address some environmental problem. (Emory)

This [new] course is highly variable as it is based on readings from the primary [science] literature . . . we discuss the political and economic issues as well, something I never approached prior to my Piedmont experience. (Emory)

Faculty were asked to report the kinds of changes they made in courses, distinguishing among straightforward substitutions of new readings, development of new student projects or assignments, and more complex changes in course organization or paradigm (see table 2).

These data show that both programs led to many different kinds of teaching changes. New readings were common. Both groups reported developing more engaged learning modules such as labs, homework assignments, and research projects for students. For example, a Chi-

nese language instructor required students to create a brochure (in Chinese) of some aspect of Emory’s campus sustainability efforts, using information taken from Web sites. A biology professor expanded a student-research Web site on cancer, adding information on environmental stressors and disease. It seems the most common way to innovate in the curriculum was to add a new unit or module to an existing course—two-thirds of respondents in both programs reported this approach. A sociology course on social movements added a unit on the environmental movement, and a course in public health added a unit on water. Over half of Emory participants added new readings to existing courses, while about a third of Tufts faculty did so. The overall paradigm of the course or its orientation was altered in about a third of Emory cases and in 18 percent of TELI cases. In a graduate business course, sustainability became the overall focus and management issues were taught throughout the semester returning to the “triple bottom line.” In a course on Middle Eastern cultures, a new framework of people, water, and land reoriented the teaching of the history and adaptations of the region.

Faculty reported making more than one kind of change in a given course and often combined new units or modules with new readings for other parts of the course or perhaps added a new course orientation. A total of 47 percent of Piedmont participants and 61 percent of TELI participants reported innovating in two, three, or four of these ways in the same course.

Finally, in a general question, faculty indicated that their teaching had, indeed, changed, even in the Tufts case, although the project ended a dozen years prior. Over 80 percent of both groups perceived that their teaching had changed more than “very little” (table 3).

TABLE 1. Percentage of Faculty Members Who Developed or Changed Courses

Number of courses	Tufts	Emory
1	30	54
2	30	24
3	20	12
4	0	3
0	20	7

TABLE 2. Percentage of Total Courses Affected by Different Kinds of Pedagogical Innovations (Multiple Answers Permitted)

Pedagogical innovations	Tufts	Emory
New readings in existing course	34	58
New unit or module in existing course	63	64
New lab, homework, exercise, research project, or other assignment	47	44
New paradigm or course orientation	18	34

TABLE 3. Percentage of Teachers Who Agreed with the Statement “I would say that my teaching has changed as a result of TELI/Piedmont”

Response	Tufts	Emory
Not at all	0	1
Very little	19	12
Some	42	55
Quite a bit	26	29
Very significantly	13	3

In sum, a substantial number of courses were developed or renovated as a result of the five years of TELI and Piedmont, affecting the experience of thousands of students. Although these two curriculum development programs did not focus specifically on teaching methods or pedagogical philosophy, our study supports the idea that bringing together a diverse group of faculty and encouraging engagements with sustainability or environmental material can also result in substantial teaching innovation (see also Eisen and Barlett 2006). And the innovations are not short-lived. The longevity of the TELI impact is striking, and the results seem not to be anomalous, as suggested by the parallel results in the Emory data.

Both faculty development workshops combine didactic and experiential learning, and participants said that the combination was stimulating to their pedagogical approaches. Small group discussions in which faculty shared teaching methods also encouraged reflection on teaching strategy and philosophy. A number of faculty reported that their own enjoyment of woods walks, field trips, and other outdoors experiences created a willingness to rethink teaching methods to find ways of engaging students more effectively (Barlett 2005c).

Raising Knowledge Levels on Environmental and Sustainability Issues

One of the difficulties in assessing program impact is the extent to which it recruits those already interested or knowledgeable in a particular subject; does it “preach to the choir”? Especially because these two faculty development programs offered a stipend, it is possible that those

expert in the area already were recruited to participate. Our survey responses suggest that there is a full range of faculty who became involved in such programs, although a good portion had some previous expertise. Between a third and a fifth said they had low levels of knowledge when signing up for the project, and roughly half of each assessed their knowledge levels as medium (table 4).

When asked how they would assess their knowledge levels today, 64–66 percent said they had increased substantially. It is impossible, of course, to separate the impact of the one curriculum development project from all the other influences in the academy and in modern American life that have raised awareness of environmental and sustainability issues. Surely, news of climate change, Hurricane Katrina, and other issues have affected knowledge and awareness. Nevertheless, these long-term assessments echo the feedback received from faculty after each workshop, that they learned “a lot” and were now “more aware.” It was a “great broadening experience,” said one Tufts respondent. “What I liked best was a chance to learn from a wonderful group of Emory colleagues,” said a Piedmont participant. “Access to a new way of thinking about my courses” was valued by another Emory teacher.

Impact on Research and Scholarship

An important project for me since it will be a major focus of my research over the coming years and this will have an effect on everything else I do. (Emory)

TABLE 4. Impact of TELI/Piedmont on Knowledge of Environmental and Sustainability Issues (%)

Amount of knowledge	Tufts	Emory
When program began		
High	16	25
Medium	56	55
Low	28	20
Today		
Increased substantially	66	64
Increased a little	34	28
Stayed the same	0	8
Declined since program	0	0

I think I understood environmental science before TELI. However, I had not contemplated the ethical, social and other dimensions of the environment introduced by TELI. It was a wonderful program. (Tufts)

Both programs focused on curriculum change and had no formal expectations or activities directed at faculty research. It is therefore very significant that many participants report that their research was affected by their participation in TELI or Piedmont. Seventy-six percent at Tufts and 62 percent at Emory reported that “my growing awareness of sustainability and environmental issues has affected my research interests.” Answers to this question were complicated by the fact that some people were already carrying out research in environmental areas. Some therefore said no to this question and others said yes, but added comments that they already were involved in these issues. These caveats were more systematic in the Emory answers, and taking out individuals who were already involved in this area leaves the percent of the remainder whose research was affected to be 62 percent (38 out of 61 individuals).

When asked if they had published in the area of sustainability or environmental issues, 47 percent of TELI participants and 28 percent of Piedmont participants said yes. The higher rate for TELI probably reflects the smaller proportion who responded, and who might be assumed to be more involved in this area. It may also be that the subsequent strong institutional engagement in environmental education supports faculty research in these directions. However, we find the result that one quarter of Emory participants report their writing had been affected shows a level of impact that was not expected by the program designers.

Professional presentations—often a prelude to publication—were also affected; 41 percent at Tufts and 42 percent of Emory faculty reported they had given presentations related to sustainability and environmental issues subsequent to their participation in the program.

Interdisciplinary Research, Teaching, or Grant Applications

[The] major contribution of TELI was to broaden my interdisciplinary background. (Tufts)

[The Piedmont Project . . .] has done an excellent job of developing an interdisciplinary environmental community across the campus by giving folks time to get to know each other. It has helped break down many institutional barriers. (Emory)

Many universities find interdisciplinary research and intellectual engagement stimulates new knowledge and is essential for creative solutions to urgent societal problems. When prompted, “My research and writing are more interdisciplinary now, as a result of the TELI/Piedmont experience,” 57 percent of TELI

or sustainability problems. We asked, “When I began TELI/the Piedmont Project, my interest in contributing to practical environmental or sustainability problem-solving (on campus, around Massachusetts/Atlanta, or elsewhere) was high, medium, or low.” Faculty are often considered “the tough nut to crack” when building momentum on campus for sustainability issues, and indeed 75 percent of Tufts faculty and 69 percent of Emory faculty said their interest was medium or low (table 5).

major factor in their sense of urgency and desire to contribute in practical ways.

As a result of TELI, I served on two Massachusetts Environmental Commissions and volunteered for two environmental committees. (Tufts)

To test what kinds of engagements this increased knowledge might have had, we asked participants to respond yes or no: “My growing awareness of sustainability and environmental issues has affected my office and work life, such as recycling, paper use, or electricity use.” At Tufts, 84 percent and 77 percent at Emory said yes. We asked for examples and participants reported such behavior changes as double-sided copying, buying office supplies with high recycled content, reducing heat and electricity use, and walking to work. Said one scientist, we “use only rechargeable batteries in our fieldwork equipment” (Tufts). Said another, “I have become a fanatic about turning off lights in my building” (Emory).

We also repeated the same question, asking about “my home life and personal habits,” and 94 percent and 72 percent respectively indicated affirmative responses. Said one, “While I was somewhat conscientious before Piedmont, I am much more intentional now about small things: paper use, lights, not letting the water run, not leaving the refrigerator open, etc” (Emory). Others mentioned more vegetarian meals, home insulation, yard composting, fluorescent lighting, and more interest in “slow food” and agricultural practices.

If the Piedmont Project didn’t change some of my behavior, it was because I already did these things. What the Piedmont Project did most significantly is reinsert the need to think about human connections and shared responsibilities into our thinking about the environment. I feel closer, more connected to and responsible for my environment—human as well as animal and vegetal—as a result of my involvement with this Project and the people in it. (Emory)

Open-ended comments at the end of the survey helped us understand that the Tufts Institute and Emory’s Piedmont Project also supported more institutional involvement and even political action.

It was a real eye-opener. It led me initially, and rather circuitously, to advance an energy initiative [campus-wide]. (Emory)

NINETY-SIX PERCENT OF THE EMORY FACULTY AND 100 PERCENT OF THE TUFTS FACULTY INDICATED THAT THEIR PROGRAMS STRENGTHENED COMMUNITY AND ALLOWED THEM TO FEEL MORE CONNECTED TO OTHERS AT THE UNIVERSITY.

participants and 42 percent of Piedmont participants said yes.

Said one person, “Yes—actively establishing collaborations with engineers, biologists” (Tufts).

While learning about Emory’s natural environment and global sustainability issues, we learn how to communicate with one another across disciplines. It is a great opportunity for faculty in the humanities, sciences, and social sciences to interact, work together, and learn from one another. (Emory)

External funding and team teaching efforts were also affected by the experience of these curriculum projects. A surprisingly high 58 percent of Tufts participants said, “I have submitted a grant proposal or collaborated in teaching with people from other departments or schools since participating in the project.” At Emory, 33 percent said yes, but two of those also indicated that they would have done so without the project. Removing those cases reduces the total to 31 percent.

Practical Action and Problem Solving

We also wanted to know if participants developed any increased willingness to be a part of solutions to environmental

Subsequent to the projects, between 50 and 56 percent of respondents indicated their interest in problem solving had increased substantially, and very few found their levels of interest to be stable or declining. As before, many influences are operating on these reported changes. The increase in willingness to engage in problem solving cannot be attributed to the TELI/Piedmont experience alone, but several faculty did indicate that it was a

TABLE 5. Impact of TELI/Piedmont on Interest in Contributing to Practical Problem Solving (%)

Level of interest	Tufts	Emory
When program began		
High	25	32
Medium	50	44
Low	25	25
Today		
Increased substantially	50	56
Increased a little	38	32
Stayed the same	9	12
Declined since program	3	0

[I] helped in designing green building. (Emory)

I've also joined my town's Conservation Commission. (Tufts)

Work on my condo board to control water run-off. (Emory)

[Reduced my] water usage as a result of involvements with the Mystic Watershed Collaborative, an indirect consequence of having been in TELI. (Tufts)

These examples of local action are important as faculty seek to encourage students toward social engagement as well. Through their own networks and experiences, opportunities for teaching students emerge as well as the legitimacy to advocate for cultural changes around environmental and sustainability issues.

Building Community within the University

Building community among faculty in dispersed departments and schools is one of the powerful benefits of special faculty development programs (Camblins and Steger 2000; Sorcinelli et al. 2006). Ninety-six percent of the Emory faculty and 100 percent of the Tufts faculty indicated that their programs strengthened community and allowed them to feel more connected to others at the university. This finding is particularly impressive, given that ten to fifteen years had elapsed in the case of the Tufts respondents, and from one to four years, in the case of Emory respondents.

An intensive and unique opportunity to meet, hear, and work with environmental scholars in areas I never would have visited or attempted (such as environmental economics). (Tufts)

Excellent community building experience for within Tufts. Has had a modest but nonetheless distinct impact on my teaching and publishing. (Tufts)

It was great to see other faculty be absorbed in the ideas. (Tufts)

The intensive contact with other faculty I had never met or knew only vaguely was really powerful and lasting. (Emory)

In fact, knowing that I now know more colleagues on campus is one of the best results of the Piedmont Project. (Emory)

The largest contribution for me was to build a sense of collegiality with people across the Emory community [which] has included . . . mutual teaching and learning, collaborative practice, and encouragement . . . one of the prize benefits. (Emory)

Knowing that a two-day or a five-day intellectual experience might be expected to have such an outcome, we wondered whether such enhanced community was of much importance to the faculty involved. Our survey showed that it mattered more than we thought: Half or nearly half of both groups replied that the "issue of community" is "very important" to them (on a five-point scale). Adding those who said community is "quite" important brought the totals to 85 percent for Emory and 78 percent for Tufts, showing that this benefit of the TELI/Piedmont experience is highly valued.

Connections to Place

A final area of interest was the extent to which TELI and Piedmont expanded faculty connections with the living ecosystems around them. Research has shown that rebuilding a sense of place and reweaving connections to ecosystemic awareness are essential components of a more sustainable national (and global) culture (Abram 1996; Barlett 2005b; Barlett 2008). When asked if their course changes involved students going outdoors more for research, reflection, observation, field trips or other exercises, 48 percent of Tufts faculty and 51 percent of the Emory group said yes. Added one, "Students respond well to these expeditions outside the classroom and the library" (Emory).

Overall, 70 percent of TELI participants and 89 percent of Piedmont participants agreed when asked whether the experience "strengthened your sense of the natural world around you." Many faculty added comments, indicating how important the time outdoors had been to their understanding of the issues. We also see that this experiential learning affected their sense of possibilities in teaching methods, and led to innovation in pedagogy.

Seeing others' reactions of wonder also reaffirmed for me that exposure to the natural environment and means to protect it does inspire others, even well established scholars, in a way that few other experiences can match. (Emory)

The historical and natural and out of doors components of TELI were truly inspirational as were the reading components dealing with those issues. That was new material for me. (Tufts)

Campus life is almost entirely indoors, office and computer oriented—this project

forces me to think about where I am and how my actions are part of a natural and human ecology. (Emory)

The project was great fun and had a lasting impact on the way I look at Emory campus. I used to see the green spaces between buildings [as] pretty, but unremarkable, stretches of undeveloped land. Now I see embattled ecosystems, and think of how these natural environments enhance our campus and need to be protected and restored. (Emory)

Conclusions and Implications

Providing a rare glimpse into the long-term impact of faculty development workshops, this study of the Tufts Environmental Literacy Institute and the Piedmont Project at Emory University shows enduring changes in teaching, research, interdisciplinary collaboration, and engaged action. Participants from five years of each program were surveyed. The Tufts program began sixteen years prior to the e-mail survey and 57 percent responded. The Piedmont Project began six years prior and 83 percent of Emory participants responded.

The study revealed that faculty do not need to commit to major curriculum overhaul to later report substantial impact on teaching. A total of 107 respondents modified or developed 140 courses (note that not all respondents were teaching faculty) and most of these continue to be taught. Although participants plan to work on only one course, half change more than one, and some change as many as four. Many of these are basic courses in their departments, enhancing broad curricular impact. A significant proportion of courses affected are new (22 percent at Emory and 9 percent at Tufts), and enrollments affected by program innovations totaled nearly 3,000 at Emory and over 1,500 at Tufts.

Commonly, respondents reported several different kinds of pedagogical innovations in each course. Although changes in teaching methods were not explicitly the focus of either workshop, faculty reported new course paradigms, new exercises and assignments, and outdoors experiences in their classes. Despite the 12–16 years since the TELI experience, impact in the curriculum remained visible.

The impact on research and interdisciplinary collaboration was also substantial, although this result was not a formal goal of either program. Increased awareness of environmental and sustainability issues and both

publications and professional presentations in these areas were reported to emerge from the workshop experiences. Collaborations in grant proposals and interdisciplinary teaching were reported by 58 percent of Tufts participants and 31 percent of Emory faculty.

Many colleges and universities seek to expand a pedagogy of engagement, and both workshops were credited with increased interest in practical problem solving, innovations in office and work life, as well as changed behavior at home. Engagements in political and institutional change were reported as well. A collegial sense of working together to address an urgent societal issue is fostered by faculty development programs such as these, and participants reported high levels of satisfaction in a strengthened sense of community across diverse units of the university. A final surprise of the research is that both groups reported a strengthened sense of a natural world around them, an important awakening to the environmental limits within which we must adapt.

Faculty at all career stages were involved. Whether the program introduces young professors to new ideas and new colleagues or brings together senior researchers—or even staff members—the results are a lasting enjoyment of knowing others from different fields. Such quality of life enhancement can be expected to support faculty retention (Barlett and Chase 2004b) and clearly undergirds new cooperation across fields.

We recognize that an assessment based on self-report has certain limitations. An important one is that it is impossible to separate the effects of these programs from the many other sources of increased environmental awareness that may influence faculty today. Especially in the Tufts sample, we may have received responses from those for whom the program was more successful. However, the fact that individuals left Tufts, retired, or became unavailable by e-mail does not necessarily imply that they benefited less from TELI. In fact, the Emory participants who have moved elsewhere mostly responded to our survey and showed patterns similar to other respondents.

These data suggest that programs can produce similar results at different dosages. TELI lasted for five days and asked faculty to read substantial amounts of material prior and during the institute. Its philosophy was to introduce new didactic material

in a comprehensive way. In contrast, the Piedmont Project lasted only two days and attempted to stimulate faculty imagination with well-honed but short lectures and presentations. The focus was on introducing a range of possible directions for integrating new materials or developing a new course; faculty then delved into their own fields independently. The TELI approach also was more focused—on environmental literacy—and more thorough in asking faculty to work together on a group project. However, the impacts of the two experiences are remarkably similar. Although there are differences in responses to the programs, the overall pattern is one of highly valued additions to knowledge, teaching method, research, and interdisciplinarity.

These results suggest that it is the experience of faculty development workshops themselves, rather than the particulars of length, content, or delivery that have lasting importance. We believe that these programs served as a catalyst for subsequent self-directed inquiry and action because they addressed a significant societal issue in a thoughtful and engaging manner. They offered participants an approach for organizing and using emergent information related to the environment.

Most important in comparing the results of TELI, which ended a dozen years ago, with the results of the continuing Piedmont Project is that there is little evidence of weakening effects over time. This suggests that faculty development programs related to the environment and sustainability are an investment that can pay significant dividends over many years.

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NOTES

1. The survey was designed as an e-mail attachment. Respondents were asked to open the attachment, complete the survey, save and return the completed document. One or more e-mail reminders were sent to those who did not respond to the initial request. The e-mail survey began by indicating: "In the following questions and statements, you can simply X the answer closest to your opinion, type in Y or N, or add comments such as 'very much!' or 'not really'" (see appendix).

2. The one-week TELI program has become two weeks in this person's memory.

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APPENDIX
The E-mail Survey

In the following questions and statements, you can simply X the answer closest to your opinion, type in Y or N, or add comments such as “very much!” or “not really.”

1. The Piedmont/TELI Project strengthened my sense of community—I now know colleagues across the campus and continue to feel more connected to others here. (Y/N)

This issue of community at Emory/Tufts is:

- Not at all important to me
 Of a little importance
 Of some importance
 Quite important
 Very important.

2. When I began the Piedmont Project/TELI, my knowledge of environmental and sustainability issues was: high medium low.

3. When I began the Piedmont Project/TELI, my interest in contributing to practical environmental or sustainability problem-solving (on campus, around Atlanta, Boston, or elsewhere) was: high medium low.

4. Today, I would say that my knowledge of environmental and sustainability issues has:

- increased substantially
 increased a little
 stayed about the same
 has declined since the time I participated in the project.

5. Today, I would say my interest in contributing to practical environmental or sustainability problem solving (on campus, around Atlanta/Boston, or elsewhere) has:

- increased substantially
 increased a little
 stayed about the same
 has declined since the time I participated in the project.

6. I would say that my teaching has changed as a result of the project:

- Not at all. Very little. Some. Quite a bit. Very significantly.

7. My growing awareness of sustainability and environmental issues has affected my research interests. (Y/N)

- a. If yes, have you published in this area? (Y/N)
b. Have you given a professional presentation in this area? (Y/N)

8. My growing awareness of sustainability and environmental issues has affected my office and work life, such as recycling, paper use, or electricity use. (Y/N)

If yes, can you give an example?

9. My growing awareness of sustainability and environmental issues has affected my home life and personal habits. (Y/N)

If yes, can you give an example?

10. My research and writing are more interdisciplinary now, as a result of the Piedmont/TELI project experience. (Y/N)

11. I have submitted a grant proposal or collaborated in teaching with people from other departments or schools since participating in the project. (Y/N)

12. Which of the following types of changes apply to the courses that you teach that have been affected by the project? (Please fill in the table below and add lines if needed.)

Short, descriptive name of course you changed: (for example, “Art Hist 101” or “Organic Chem”)	Level of course: g) graduate u) undergrad, or b) both	Course offered a) once only b) regularly c) other—please explain	Type of course change (a, b, c, d, e, f—see below)	Number of students typically enrolled

(appendix continues)

APPENDIX (continued)

- a) New readings in existing course
- b) New unit or module in existing course
- c) New lab, homework, exercise, research project, or other assignment
- d) New paradigm or course orientation
- e) New course with environmental or sustainability focus
- f) Other—please explain

13. Did your course changes involve students going out of doors more for research, reflection, observation, fieldtrips, or other exercises? (Y/N)

Any comments?

14. Overall, would you say that the Piedmont Project/TELI experience strengthened your sense of connection to the natural world around you? (Y/N)

Any comments?

15. What else would you like to say about your experience in the Piedmont Project/TELI?

May I follow up with you if I have further questions? (Y/N)

Name:

Department:

Thank you very much for your help with this project.

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