Faculty-Student Service Learning, Research Teams and Political Science Concepts: The Case of a Historic Green-Building Project on a College Campus

Angela C. Halfacre
Katharine A. Owens
Katherine S. Zimmerman and
Zachary H. Hart

Department of Political Science
66 George Street
College of Charleston
Charleston, SC 29424
843.953.5825
halfacrea@cofc.edu

Copyright by the American Political Science Association.”
Abstract

Most traditional classroom experiences in political science training rarely afford students an opportunity to participate in community service-learning (assessing and addressing community needs) and/or research teams (collaborative scholarship). Our service-learning and research team used the principles of sustainability and community participation in renovating a 200-year-old campus office building at the College of Charleston, South Carolina. This approach enabled students to address real-world, public policy problems, and complemented traditional classroom experience and reading exposure by encouraging students to connect theory with practice. Through active learning, students gained skills in organization, mediation, and administration. In this case study, direct involvement solving local problems further fostered a sense of community. Since the project included community involvement, the students gained a better sense of community.

Introduction

Political Science faculty members often seek ways to promote civic participation and encourage students to connect theory with practice. For this paper, we review and analyze an innovative approach to teaching political science concepts while promoting community service. This method uses Dewey’s concept of civic participation—“learning how a community works and how to help it work better”—by applying principles of sustainability [e.g., “meets the needs of the present without comprising the ability of future generations to meet their own needs” (in Rosenbaum, 2002, p. 372)] to a local problem (Dewey in Ehrlich, 1999, p. 246). For this project, a political science faculty member organized a graduate and undergraduate student research team to conduct service-learning activities to address community needs and to conduct campus and community outreach.
Additionally, the two graduate and four undergraduate team members pursued team and individual independent research. By providing a model of how to approach the prevalent, often neglected issue of achieving a sustainable community, the service-learning and research team improved their campus and larger community while team members gained necessary expertise for their future professional and civic participation.

The historic peninsular city of Charleston, South Carolina has many aging buildings and homes that are neither resource efficient nor have occupant-healthy environments. Unlike aging buildings in other cities, local historic preservation laws challenge the Charleston community to make buildings energy efficient while maintaining historical integrity. Situated in the heart of the Charleston peninsula is the College of Charleston. As the college has expanded, it has utilized historic buildings, remodeling them into campus department offices. In this way, the buildings of the College of Charleston serve as a microcosm for those of the city. Our goals were to find and demonstrate inexpensive methods to increase energy efficiency and improve indoor building and occupant health while balancing historic preservation concerns.

The team renovated a 200-year-old building at the College of Charleston, South Carolina, using the principles of sustainability and community participation to fulfill our goals. The successful renovation of the building occurred through coordinating individual skills and roles within a team environment. Our team (the first three authors of this paper and four other students) met its goals by successfully integrating interdisciplinary subject matter, using collaborative instruction and cooperative learning, and independent and participatory active problem solving (Benjamin and Hanes, 2000). This learning approach provides students with better preparation to address real world, public policy problems.
than traditional teaching methods alone (Benjamin and Hanes, 2000), and combined with civic education, service-learning and research emerges as a truly powerful teaching tool.

**Traditional Political Science Teaching Methods**

A major goal of Political Science is to prepare students to recognize and solve problems (Ehrlich referencing Dewey, 1999). Political science teaching methods usually do not attempt to blend subject matter, theory and practice in traditional classroom settings. However, to provide students a better opportunity to understand and apply theory, instructors must take learning beyond the normal confines of the classroom. When students apply classroom learning to solve community problems, the learning environment is dramatically enhanced; this strategy may help develop students into better citizens (Bennett 2002).

The exploration of community problems often uncovers solutions that cross many disciplines. This reality forces students and instructors to look beyond the narrow disciplinary approach that is predominantly the venue of classroom-based instruction. Community projects encourage dialogue between discipline specialists to address an issue and solve a problem (Hauss et al., 2002). Through multidisciplinary dialogue, students are able to understand participants’ similarities and differences and hopefully find common ground between conflicting interests in an attempt to solve a community problem (Hauss et. al, 2002). Moreover, multidisciplinary approaches to political problem solving helps to bind the social sciences to other academic disciplines, reinforcing the relevance of political science in student civil life (Bennett, 2002). Many community problems require science and policy interactions, and teams of students representing either field will thrive in an environment that draws on collective expertise.
and experiences to address these problems (Schlosberg and Sisk, 2000). Students have various areas of expertise, and blending these areas to problem-solve helps participants seek creative solutions that are outside a single discipline, thus mirroring the reality of actual public policy decisions (Mayer, 2002). In addition, academic problem solving demands interaction with the real world. This can be achieved through not only a multidisciplinary approach, but also crossing boundaries separating academia and the rest of the world. University policy and maintenance, which this project seeks to influence, is a part of this real world. Incorporating reality strengthens students’ quest to practically solve these problems.

The green building problem-based, collaborative service-learning project encompasses many of the best practices that enhance student learning. Furthermore, the elements of this environmental-based learning experience are similar to those of other successful programs (Benjamin and Hanes, 2000). The common features that Benjamin and Hanes, (2000, 177) found in successful learning projects include: interdisciplinary integration of subject matter; collaborative instruction; emphasis on problem solving and projects; combinations of independent and cooperative learning and; learner-centered approaches— active participation.

We find all Benjamin and Hanes’ components in our approach to the Green Building Renovation Project. In the following sections, we describe how The Green Building Renovation Project exhibits all five characteristics of Benjamin and Hanes’ (2000) definition of a successful integrated learning experience. In addition, our project strives to provide a civic education yielding a truly powerful teaching tool.
**Project Scope and Methods**

Green building practices are increasing college campuses across the country to promote sustainability (e.g., Smith, 1993). Before this project, no College of Charleston structures incorporated significant green building technology. Green building can be defined as a collection of land-use, building design, and construction strategies that reduce negative environmental impacts and increase sustainability. Benefits of building green include energy efficiency, protection of ecosystems, increased profitability, and improved occupant health (US Green Building Council, 2003). Green building is closely associated with the concept of sustainability. Sustainability has many definitions, and often integrates three primary concepts: environment, economy and social equity (Wheeler, 2000). One commonly utilized definition, and the one we use here, is the Brundtland Commission’s definition of sustainability -- meeting today’s needs while considering future needs (in Rosenbaum, 2002, p. 372).

**Case Location**

Team participants spent the summer renovating a 200 year-old campus building located at 114 Wentworth Street in Charleston, South Carolina with the goal of the project to make the building as "green" or sustainable as possible. The service-learning and research team regards sustainability as increasing resource and energy efficiency while improving air and water quality in an economically viable way.

The City of Charleston, similar to many Atlantic seaboard communities, has a substantial number of historic structures built and renovated prior to the use of green building techniques. Thus, both the college and the city share similar building
rehabilitation dilemmas. These problems are particularly acute in the low-income areas near the College of Charleston. The long-term goal of this service learning research project is to demonstrate how green building techniques can be affordably introduced into historic homes, making it cost-effective for low-income families to enhance the quality and efficiency of their living space. This combination of concerns—energy efficiency and preservation—are associated with the majority of buildings on the peninsula. Finding inexpensive methods to increase efficiency addresses community concerns to conserve resources and live in a healthy, affordable habitat.

This project targets two primary communities: the City of Charleston and the College's centrally located, municipal campus. The Charleston Peninsula has in the past few decades experienced a resurgence of home ownership and renovation. At the southern end, near Charleston Harbor and the Battery, homes date from the late 1700s, and act as attractive historic structures—beneficial for aesthetics, but antiquated in energy efficiency. In the center of the peninsula are several neighborhoods as well as public housing projects. Toward the northern end, near Interstate 26, are more housing projects and condensed communities requiring substantial renovations. Thus, the peninsula hosts many different socio-economic groups that can benefit from sustainable building techniques. The sum of money spent to renovate the building\(^2\) is not a large one considering the building's size (4,500 square feet). The faculty-student research team has outlined renovation projects that range from no cost to expensive (no activity was greater than $2500 in materials and labor). Therefore, a community member representing any of the aforementioned neighborhoods could utilize the model and combine techniques to fit their budget.
This project attracted community, faculty and student volunteers to work on the renovation activities; in addition, the six service-learning and research team members each worked an average of 45 hours per week for the entirety of the summer and 20 hours per week during the academic year. These hours worked were largely volunteered. To date, over 7000 hours (again, mostly volunteered) have been contributed to the project.

*Team Research and Service Approach*

After the supervising faculty member’s selection of the diverse team members, each student constructed a list of possible changes to include in the green retrofit. These lists were compiled and discussed providing the team a hands-on opportunity to practice democratic concepts through the collaborative prioritization of green goals and to best spend $10,000 (Sustainable Universities Initiative Mini-Grant Funds) to transform the historic building. The team designated a three-step plan: 1) determine the most cost-effective techniques; 2) measure the before and after effects of the retrofit; and 3) promote the use of this model building in teaching, outreach, and research activities.

The participating team members conducted an initial audit of the building, which included energy consumption, waste production, and drinking water quality. The students used the US Green Building Council’s Leadership in Energy and Environmental Design (LEED) system to rate the building before, during, and after refurbishment (US Green Building Council, 2003). Faculty members working in the building were interviewed before changes were implemented and were interviewed again after one year. In addition, team members were asked to keep journals throughout the project and were interviewed after completion of the renovation. The greenbuilding process was consistently updated on the project website: www.cofc.edu/~greenbuilding.
Implementation of Retrofit

After careful review of possible techniques, in summer and fall 2002, the students arranged for, conducted, and monitored the installation of the chosen renovations. Some improvements were both simple and inexpensive such as insulating the hot water heater, checking for leaky pipes and replacing incandescent bulbs with long-lasting, efficient compact fluorescent lighting. More expensive and/or labor-intensive improvements included installing insulation, repainting the interior with paint lacking Volatile Organic Compounds (VOCs) and installing interior storm windows. After refurbishment of the building was complete, the students were responsible for monitoring changes in energy consumption and reductions in expenditures.

Outreach

Due to the College of Charleston's highly visible presence and impact on the City, the campus has a responsibility to the surrounding community to promote sustainability by serving as a role model for environmental awareness. As with the various campus facilities, the techniques used within the model building can serve as an example for the many historic structures on the Charleston Peninsula. By offering tours for local residents and government officials, the demonstration building located within the College of Charleston campus is a case study for educating the public on the ideas of sustainability. The research team continues to conduct extensive outreach and providing education opportunities.

Results
By using Benjamin and Hanes (2000) common features (discussed above) found in successful learning projects, we evaluate the effectiveness of the green building project in meeting these goals. To further assess Benjamin and Hanes’ (2000) common features, a graduate student not involved with the project interviewed all research and service learning team members. To analyze the semi-standardized interview data, this individual used content analysis (a technique to objectively analyze text; outlined by Berg, 2001).

Through the identification various themes expressed and lessons learned by members of the team after completion of the project. These thoughts can then be made available to others in the hopes that similar future undertakings will build on predecessors’ efforts. As with most group efforts, the Green Building Team experienced internal conflict and various external pressures as well as great successes. Opinions expressed in semi-standardized interviews with each of the seven team members summarize these conflicts and pressures and may provide valuable insight on team dynamics and other areas for future team efforts. Our discussion below incorporates the findings of this analysis throughout.

*Interdisciplinary Integration of Subject Matter*

The diversity among team members allows input from many disciplines while team discussions challenge ideas and perceptions among its members. By combining students of various disciplines, ideologies, and goals, no student involved in this project risks the “debilitating” problem of overspecialization (Orr, 1992, p. 129). The students have thorough backgrounds in their chosen areas of study, yet this specialization does not allow ignorance of more holistic analysis of issues. Instead we embrace a whole-systems view of our problem, and utilize individuals with differing areas of expertise. The Green
Building Renovation Project combines the efforts of four undergraduate and two graduate students with majors and minors in Political Science, Environmental Studies, Biology, English Literature, Anthropology and Studio Art.

*Collaborative Instruction*

Collaborative instruction among students, faculty and community members allows the exchange of information and learning to be an experience without boundaries. Accordingly, this type of learning not only teaches students to be productive team members, but also is important in the understanding and practicing of democratic ideas. Collaborative instruction helps students appreciate the complex nature of communities (Ehrlich, 1999). Students learned about sustainability techniques by touring Blackbaud Corporation (for green management ideas), Dewees Island, The Center for Sustainable Living, and The Sustainability Institute (for green building/renovation techniques).

Collaborative learning expands the experience of the individual, forming a collective, interactive knowledge base. Everyone involved with the project experiences both teaching and learning roles. All team members were assigned specific technologies to research, and in turn informed other team members about the positive and negative aspects of each technology. Some community members offered expertise regarding Heating, Ventilation and Air-conditioning systems, while others became informed about technologies like waterless urinals through their interactions with the team. Building faculty offered advice and information on topics including but not limited to thermostats, ceiling fans, and insulation. In exchange, Political Science building members have been exposed to dozens of sustainable or environmentally friendly concepts and technologies over the course of the project.
This flow of information between team members allows ideas to be more completely developed and evaluated—an example of democratic concepts in action. The diverse team environment encourages students to evaluate opinions from contrasting perspectives, which enhances students’ reasoning (Jurkiewicz, 2002). This reassessment requires individual student team members to reevaluate their own priorities to meet the team’s collective goals. For example, group discussion involved evaluating positive and negative aspects of insulation types. The students had to weigh the benefits and risks of fiberglass insulation versus recycled cellulose insulation, including energy use reduction, indoor air quality, economic cost, and occupant health. The students balanced personal beliefs with a risk-benefit analysis to determine an appropriate compromise when selecting the insulation. This decision-making process improved the student’s mediation skills (Jurkiewicz, 2002). In particular, debates within the team addressing issues of concern help develop communication skills with outside collaborators, educational departments, college staff, and building inhabitants. The mediation and communication skills gained—learning to be a part of a team—will benefit the professional life of each student team member.

Problem solving

Problem solving, teamwork and self-reliance were emphasized in every facet of The Green Building Renovation. Students managed time schedules, budgets, data collection schedules and Website development. The team reduced costs by implementing many projects themselves such as painting and insulation. The student team and faculty advisor finalized all decisions about the scope and approach of the project. Finally, the team continues to monitor the building daily. Throughout this project, the team struggled with internal
problems like variation in commitment levels of members and discussion over what some members viewed as unnecessary designation of leadership roles.

Independent and Cooperative Learning

Through collaborative service learning, Green Building Team members built upon a number of pre-existing research interests including historical restoration, green building, sustainability, and environmental communications and policy. Additionally, some team members identified new research interests that were spurred primarily through project activities including corporate and government organization, green technology, household toxicity, and environmental product markets. In many instances, research interests were reinforced through the team atmosphere of the Green Building Project. The lessons offered by team members of the Green Building Project will hopefully be utilized by future groups to guide further successful environmental inquiry.

Active participation

An active learning approach encourages attentiveness, increases information retention, and enhances the development of critical thinking skills (Smith and Boyer, 1996). Benjamin and Hanes (2000) demonstrated that active learning positively advances student classroom achievement. Combining classroom pragmatism with a holistic approach beyond the narrow focus of specific disciplines is an effort to solve the true problems of resource inefficiency and enhances learning (Orr, 1992; Wheeler, 2000). The team’s involvement with the community engaged the students in local problems and helped them to become more involved citizens. This level of community involvement helps to foster lifelong community stewardship (Ehrlich, 1999).
Most members of the Green Building Team felt that community outreach was an especially successful component of the project. Some members expressed that the community outreach aspect of the project is still a work in progress, but most were happy with the level of project awareness and recognition in the College and surrounding community. Although most team members also viewed the physical changes to the building as successful, many would have made different building alterations in retrospect to more efficiently stretch funding and provide for a “greener” model of renovation. The Green Building Team generally felt pressured by time and budgetary constraints, and several would have liked more time for preparatory work and baseline data collection.

Team members identified several specific project activities that were especially helpful in building a sense of team among those involved. The most often identified of those activities was socialization outside the project. Informal interaction with one another opened communication channels and made certain team members more comfortable and open with one another. Additionally, time-consuming and labor-intensive renovation activities like interior painting and insulation had a team-building effect. Group interaction during these activities made the tedium and long hours more tolerable and offered team members great opportunity to develop personal relationships. Team members also identified weekly meetings during the planning phase of the project as initially helpful in team building.

When team members became frustrated or exhausted with the project, they most often expressed these sentiments to other highly involved team members. Several students vented to friends outside the project. Team members demonstrated varying levels of commitment and involvement; one was viewed as largely absent from the latter stages of
the project, and two others were at different times demanded by other responsibilities. The often-unequal distribution of project work at times caused turmoil within the team. Team dynamics were allowed to play out, however, as the project faculty advisor maintained an unauthoritative, advisory role.

The outreach efforts also aid student communication abilities, fostering “speaking and presentation skills” (Smith and Boyer, 1996, p. 690). Team members’ journal entries attest that presentations and tours of the Green Building have improved personal public speaking abilities and comfort levels in front of audiences.

**Discussion**

The College of Charleston Green Building Renovation Project allows direct involvement solving an environmental problem in the Charleston community and the College of Charleston: making buildings energy efficient while maintaining a building’s historical integrity. The problem-based, collaborative service-learning approach enhances the political science learning process by addressing real world, public policy problems. The need to solve a community-based problem requires a multidisciplinary approach. The interdisciplinary student team’s active learning constitute a powerful learning and problem-solving tool. This approach enables students to transform abstract theories into realistic solutions and enriches the student educational experience and professional development. In addition, direct involvement in solving a community problem cultivates a stronger sense of community. The barrier between college and surrounding town disintegrates, as the student becomes a part of the community problem-solving initiative.
The project continues to spur other research among the team members, as well as with independent student researchers. For example, two students are currently seeking funding to develop a native species garden on the grounds of the Political Science building. This is the first step in a multi-phase plan emphasizing native plants in campus green space, pea-patch gardening, community gardens and seed banks. Another group of students has partnered with the mayor Joseph Riley of the City of Charleston to conduct a citywide greenhouse gas assessment through the Cities for Climate Protection Campaign (CCPC). CCPC is a campaign developed by The International Council for Local Environmental Initiatives (or ICLEI). The assessment will be used to produce a citywide greenhouse gas emission reduction plan. A third group is currently developing criteria for area businesses to competitively seek a “Sustainable Charleston Business” designation, hoping to foster awareness throughout the local business community regarding green or sustainable purchasing and operation options. Additionally, individual research and thesis projects stem from the Green Building model. Two thesis projects and one bachelor’s essay focus on community and campus participation, awareness, and support of sustainable enterprises.

The Green Building Renovation Project is a model for solving an imperative problem of sustainable development and garners active participation among community members, students, and faculty. In addition to being a powerful method of integrating environment with learning, we argue that active participation also fosters a sense of community among participants. When students are encouraged to integrate their studies to solve community problems, political science learning is enhanced. The Green Building Renovation Project links civic learning with service-learning: two powerful
pedagogical approaches to prompt learning and civil responsibility (Ehrlich, 1999). In the early 1900s, Dewey (in Ehrlich, 1999 not seen) emphasized that “civic learning—in the sense of learning how a community works and how to help it work better—and academic learning should be mutually reinforcing” (p. 246). The Green Building Renovation Project prompted the student’s active community involvement and forced them to forge alliances among various types of people. The group recognizes the need to address economic levels among the community, as well as the enhancement of quality of life. To achieve a civil society, it must be recognized that issues integrate with one another in the real world.


Green Building Renovation Project Website. www.cofc.edu/~greenbuilding


Smith, Elizabeth T. and Mark A. Boyer. 1996. “Designing in class simulations”

P.S. Political Science and Politics. 29:690-694.


---

1 We wish to thank the student, faculty, and staff participants; the Sustainable Universities Initiative for their generous funding of the project; and those who donated time, expertise, or green products for use in the building. An earlier version of this manuscript was prepared for delivery at the 2003 Annual Meeting of the South Carolina Political Science Association, Winthrop University, Rock Hill, SC February 14-15.

2 The primary funding source for the project was the Sustainable Universities Initiative (SUI) Mini-Grant Program ($10,000). These funds were used for materials and outreach. The College of Charleston Department of Political Science provided summer research stipends for three of the undergraduate participants in the total amount of $1400. The college Environmental Studies Minor provided one summer research stipend for the other undergraduate in the amount of $450. The College of Charleston Master of Environmental Studies Program provided two academic year half-time assistantships to support the graduate students ($4500 for each student) and outreach material funds ($500). The College Committee on Environmental Responsibility and Recycling provided $1400 for energy monitoring equipment. Further, local community businesses donated supplies or provided materials at reduced cost. These items were valued at approximately $1500.
Since the start of the project in April 2002, the project has made significant progress in implementing energy efficient technologies in the historic building on campus. After an initial average energy consumption spike in July and August 2002 (due in part to the major construction phase of the project), the researchers found the average energy consumption rate fell by .8 KWh for September, October, and November 2002. These months are .35 KWh below baseline averages when compared to the baseline data from May and June. If this trend continues the research team estimates a $1.50 savings per day attributed to sustainable technologies for the 4500 square foot building. This could mean a $547.50 energy savings for the year. If these savings remain constant, the other 64 historic buildings on campus were of equal size, and each of these buildings achieves the same amount of energy savings, projected savings campus wide would be approximately $35,000 per year.