

From Local to Global: The Role of Interdisciplinary Place-based Research in Teaching Environmental Economics

Sean P. MacDonald*

ABSTRACT

This paper examines the value of teaching undergraduate Environmental Economics from an interdisciplinary perspective. At the same time it considers the benefits of employing the resource of the immediate community as a laboratory where guided student place-based research on environmental challenges can serve as a valuable tool in gaining a meaningful understanding of both local and global environmental challenges. This process is viewed as one that encourages students to make real connections between the theoretical study of environmental problems and the experience of these challenges in actual communities. At the same time, an interdisciplinary approach – incorporating the perspectives offered by other disciplines – can build upon a broad-based understanding of current environmental challenges.

INTRODUCTION

The incorporation of place-based research in undergraduate study has gained increasing attention relatively recently. The arguments for its practice stress the value of students' gaining more than simply a theoretical understanding of an issue or problem. Direct observation, research and inquiry are viewed as enabling students to acquire an understanding that makes issues real – that gives them life. In the process, students attain the ability to make meaningful connections between the study of a problem and the experience of it.

The practice of place-based research can encompass a number of dimensions. First, it makes students active participants in pursuing their research interests, ideally collaborating in small groups on addressing an issue. Second, it often involves interacting with individuals and organizations outside the limits of the classroom, and through that interaction, gathering information through informal interviews and discussions. It also involves some form of documentation of observations through the noting of impressions, taking photographs, and making connections between those observations and secondary research sources. Place-based research also makes possible the development of a multidimensional understanding that integrates the perspectives of other disciplines into the study of a specific issue, topic or problem.

The literature on place-based research as a “high impact educational practice” has been promoted in the literature most notably by George Kuh over the past two decades. Kuh has written extensively on the

* Department Of Social Science. New York City College of Technology. City University of New York.

topics of fostering student engagement (1991), the value of student research outside of the classroom (1995, 2008) and how to create the kind of conditions that encourage such practices (2005). An emerging new literature on place-based research has begun to take shape in just the last couple of years, as the foundations of Kuh's initial ideas about how to bring the undergraduate learning process to life has taken root across a growing number of disciplines and institutions. What much of this new literature has in common is the conviction that undergraduate research and learning that is linked to events in the real world or 'hands on' experience brings study and research to life and enables students to make meaningful connections between theory and direct observation and/or practice.

One dimension that has not been widely addressed in the literature is the potential contribution of an *interdisciplinary* approach to place-based research. The goal of this paper is to expand upon this literature, highlighting the benefits of including place-based study in undergraduate research, while at the same time drawing upon the perspectives offered by other disciplines that have the potential to both sharpen the critical thinking process, enable students to make connections among common themes across disciplines, and lead students to unique perspectives on topics of research. This is then discussed in the context of an undergraduate Environmental Economics course currently offered at the New York City College of Technology that is grounded in both place-based research and an interdisciplinary approach to the study of current environmental issues. The paper begins with a review of the literature on place-based research, examines the application of the interdisciplinary perspective, and discusses how this is being applied in the Environmental Economics course. Finally, it offers an example of a current student research project that illustrates the benefits of an interdisciplinary approach to place-based learning.

LITERATURE REVIEW ON PLACE-BASED RESEARCH

George Kuh (2008), in his "High Impact Educational Practices" identifies collaborative projects as linked to two key goals that together work to facilitate active learning. He notes that the process of "learning to work and solve problems" with others serves to reinforce confidence in collaborative problem solving while helping to enhance students' own understanding by developing listening skills and learning to seriously consider the insights and perspectives of others which often derive from diverse cultures and life experiences.

Kudryavtsev, et al (2012) points to the growing attention that the "sense of place" has gained in the literature on environmental education, despite the reality that, until recently, there has been little connection between the abundant "theoretical and empirical sense of place literature" that has proliferated since the 1960's and its application to environmental education even as interest in place-based education has grown in recent years. The authors examine how the application of the existing empirical literature can be applied to defining and developing an understanding of the sense of place from the perspective of environmental

psychology, noting that “affective ties to places may motivate people to be better informed about local environmental issues...”

Based upon much of the literature, the authors concur that the connection to place is a means to nurture connections across many dimensions that are defined as key to the individual’s development of a social, emotional, attitudinal and behavioral connection to environment. They note the strong correlation that has been observed between the “strength of place attachment and willingness to actively contribute to solutions” to environmental problems. By extension, they find evidence that a meaningful connection to place encourages “pro-environmental behaviors, attitudes, and awareness” (2012). Thus, this physical connection with the subject of study can effectively promote a higher level of commitment to environmental preservation.

The importance of place attachment is derived both through direct and repeated encounters with a physical location and through indirect learning. Both this *experiential* approach and *instructional* approach are identified as complementary in cultivating a sense of meaning about place (2012).

Kemp (2006) similarly observes that while the use of the term “place based education” has appeared in the educational literature relatively recently – over the last ten years – the theoretical literature dates to the late 1960’s. Much of this early literature he identifies as rooted primarily in the theoretical and philosophical with a focus on defining what place-based education would include. This includes the concept that place based education “is learning that becomes meaningful when rooted in place.” Further “when students become interested in the place in which they live” they become more involved, motivated and “have a tendency to retain more information.”

Another benefit of the place-based approach is the opportunity to reconnect young researchers to the natural world. Victor (2013) argues that “Integrating outdoor experiential education into the student experience” provides students with the means to develop an insight into both their own character strengths and those of others, “as well as an opportunity to foster an understanding of their position within the larger world” (2013). The author reports on the findings of a study she conducts of the long-term influence of a place-based and experiential learning on former students of an undergraduate English literature course in which students examined the literature of New England writers through both exploratory writing and actual exploration of the “New England countryside, its people, culture and history.” Through interviews with former students, she finds that the experience “nurtured creativity, increased collaboration skills, developed self-confidence/self-knowledge, and reinforced the importance of having a relationship with the outdoors” (2013).

This study offers strong support for the notion that the real world experience of place-based study can provide enduring learning and life skills and curiosity about the world long after students have completed their undergraduate studies. These findings also offer valuable evidence that the immediate goals of place-based study – encouraging critical thinking, collaborative learning, and developing a connection between

the study of a subject or issue and the observation and encounter of that issue in the real world – can have a life-long impact.

Zandvliet (2013) also conducted a study to investigate the question of how students perceive various aspects of an “ideal” environment for learning in the context of an institution of higher education. The study’s findings reaffirm many of the benefits of place-based and collaborative learning. Students were found to attribute the most value to an environment in which there was group cohesiveness, that promoted active student participation, offered opportunities to interact and share ideas, and that incorporated field activities into the curriculum (2013).

The literature on collaborative interdisciplinary research has examined how students can successfully develop critical thinking skills through active learning that encompasses a variety of disciplinary perspectives on a topic. Bain (2004) emphasizes the role of active student engagement in meaningful learning. He identifies the importance of incorporating interdisciplinary approaches to studying questions and solving problems. To facilitate this process, he stresses the benefits of collaborative work, that integrates different disciplines, and moves beyond students’ immediate areas of study and expertise, and in the process encourages new ways to think about how to complete a project. Bain describes an important part of this process as one that involves students in interdisciplinary research on, for example, social, economic, environmental, community and other disciplinary perspectives (Bain, 2004).

Luddick (2001) points to the inherent interdisciplinarity of place-based study. He points to the potential application to the disciplines of “economics, technology, geography, the environment, law, government, education, communication, psychology and a variety of scientific endeavors.” At the same time, he stresses the range of skills that are potentially cultivated and strengthened, including those of observation, decision making, writing, research, problem solving, critical thinking, and participation (2001).

PLACE-BASED RESEARCH IN AN INTERDISCIPLINARY COURSE

The Environmental Economics course outlined here incorporates place-based research and inquiry, in combination with other features. These include an interdisciplinary approach featuring guest lecturers from other disciplines, a focus on encouraging active student engagement through a variety of means, including a course blog site designed to promote active exchange of ideas, and a critical analysis of environmental challenges that encompasses more than one discipline.

At the New York City College of Technology, an interdisciplinary course has been defined as one that:

Involve(s) two or more academic disciplines or fields of study organized around synthesizing distinct perspectives, knowledge, and skills. Interdisciplinary study focuses on questions, problems, and topics too complex or too broad for a single discipline or field to encompass adequately; such studies thrive on drawing connections between seemingly exclusive domains. Usually theme-based, interdisciplinary courses intentionally address issues that require meaningful engagement of multiple academic disciplines. Pedagogical strategies focus on, but are not limited to, inquiry or problem-based learning. (from *Criteria for an Interdisciplinary Course*.(2012) New York City College of Technology, City University of New York)

The theme of the course focuses on how to promote sustainable economic growth and how technology, planning, design, and social and economic priorities can be applied to the goal of addressing global climate change and how working toward that goal strengthens and advances sustainable economic development. This focus encompasses the potential contributions and perspectives offered by guest lecturers and readings from other disciplines in addition to that of Economics. This interdisciplinary approach is designed to provide a comprehensive understanding of the subject and expose students to the knowledge and methodologies of other disciplines' regarding environmental problems. An important goal is for students to learn how to apply the concepts and methodology of other disciplines to the understanding of the many dimensions of global climate change and to recognize the value they contribute to a comprehensive perspective on environmental issues.

Topics covered in the course and discussed by guest lecturers include: (1) the global economic impact of emerging market economies and rapid industrialization (Economics and Sociology); (2) the importance of sustainable land use and agricultural practices (Geosciences); (3) how contextual, emotional and cultural influences shape consumer decision making (Psychology); (4) how and where investment in renewable energy and economic practices is generating measurable benefits in the U.S. economy such as in commercial, industrial and residential settings (Economics); (5) how the expansion of sustainable building and design practices - growth of green building design, construction, engineering and architecture – encourage renewable energy practices, reduce overall energy demand, and promote cleaner energy sources (Architecture and Engineering); (6) why environmental, economic and social justice and public policy initiatives such as expanding investment in public transportation and reducing income inequality are important to the goal of achieving globally sustainable growth; (Public Policy); (7) how sustainable tourism and fair trade work to encourage and promote renewable resources and sustainability (Hospitality Management).

Having already taken an introductory level economics class – either Microeconomics or Macroeconomics - students begin with a basic foundation in the discipline. The introduction of the wide range of issues and problems covered in Environmental Economics that are directly linked to these and other disciplines, expose students to the knowledge and methodologies of other disciplines whose perspectives and knowledge are closely linked to the issues Environmental Economics explores. Much of this knowledge is critical to the development of a more comprehensive understanding of the issues, with the goal of expanding students' perspectives.

Within the first few weeks of class, students are encouraged to define the central topic or question that will be the focus of their semester research project. The goal of students' field research is to encourage the investigation of an environmental practice, problem, project, etc. from the perspective of one or more disciplines. Many students choose to define an issue that is tied to their major field of study. Part of the

process of that study is to connect their investigation to both the perspectives of at least one other discipline and to the notion of how their topic is linked to sustainability from an economic perspective.

INTERDISCIPLINARY FOCUS

The interdisciplinary focus connects directly with students' field research. In this particular course, the focus of that place-based research largely draws upon the resources of the Brooklyn waterfront, a rapidly evolving area that combines vibrant new state-of-the-art projects, LEED certified buildings that house new business start-ups focused on sustainable product design and production, and urban rooftop gardening projects, together with renewed efforts at revitalizing and renewing communities that have been designated Superfund clean-up sites by the Environmental Protection Agency.¹

Student researchers, having been exposed in the classroom to the knowledge and methods of inquiry of other disciplines from invited guest lecturers, select a site to visit that relates to the subject of their research topic. A key goal in incorporating the perspectives of more than one discipline in their field and secondary research is to link their inquiry to the theme of economic sustainability.

To develop a clearer picture of the practice of interdisciplinary place-based research, an example might focus on, for instance, the study of the impact of a local water pollution problem. This ideally would involve a visit to the site and to a local organization directly involved in addressing issues related to the site and the surrounding community. The Gowanus Canal in Brooklyn, NY, which was designated a superfund clean-up site by the Environmental Protection Agency in March 2010, has spawned a vibrant community response through the Gowanus Canal Conservancy and other community organizations who are actively involved in community renewal and in educating the public about the status of the clean-up, the environmental challenges the canal faces, and the progress of work toward revitalizing the ecological, residential, and business life of the community.

The Gowanus Canal Conservancy, a non-profit community organization has taken a central role in much of this work, becoming a valuable resource, initiating local conservation projects, organizing walking tours, highlighting the community's resiliency in the face of the challenges, working on restoration and resiliency projects, and coordinating community educational outreach through an 'Urban Ecology Lecture Series' and public and educational tours.

Student place-based research at this site could be guided by the question of '*How the local economy has been impacted and progress toward recovery,*' and might begin by examining the historical evolution of the site. The Canal, which dates to 1869, served as a major transportation route between Brooklyn and New York City (Manhattan) when the two were separate cities. Today, it is one of the nation's "most extensively contaminated water bodies" according to the EPA's Region 2 Superfund decision. Surrounded by chemical plants, tanneries, gas plants and other manufacturing activities that routinely dumped wastes

into the canal, compounded by storm water runoff ... the site contains "PCB's, coal tar wastes, heavy metals and volatile organics" (EPA, 2014).

The project would examine how the revitalization of the surrounding community is working toward economic sustainability through the site's adoption of a system to capture storm water run-off, creation of an educational center, and cultivation of the original natural habitat in the community. The study of the site would investigate issues of sustainable land use, active measures to reduce further water pollution and locate this within the context of rebuilding a sustainable local economy.

One example of student research currently underway involves a student applying place-based research to his work on the Solar Decathlon Project, a Department of Energy funded project involving 30 universities nationwide that have been challenged to design and build a model for an energy efficient house. The Department of Energy website describes the competition as follows:

Solar Decathlon challenges collegiate teams to design, build, and operate solar-powered houses that are cost-effective, energy-efficient, and attractive. The winner of the competition is the team that best blends affordability consumer appeal, and design excellence with optimal energy production and maximum efficiency" (2014). The project at New York City of Technology, involves faculty and students across a number of disciplines ranging from architectural engineering technology to mechanical, computer and electrical engineering technology, among others. (2014)

The student's project will involve demonstrating how both his collaborative involvement in the design and planning process and active participation in interdisciplinary team work (with other students and faculty) enhances his knowledge of the contributions of other disciplines, and the importance of real world experience in learning and achieving a goal related to sustainable design and energy. He will also research secondary research on solar energy technology, sustainable design and other related topics and how these relate directly to the issue of how investment in renewable energy promotes sustainable economic growth and development.

In the process, the goal is for the student researcher to sharpen critical thinking skills, to examine, study and evaluate his experience from the perspective of more than one discipline, to recognize how this project and research are linked to the theme of how policies and practices can promote sustainable economic development, and to connect and integrate cross-discipline knowledge to draw conclusions.

ENDNOTES

1. An example here includes the Brooklyn Navy Yard, a multi-acre space that has recently undergone significant renovation and reconversion to a site for new businesses, both large and small, including film producer Steiner Studios; new buildings featuring sustainable construction, materials and energy sources that are beginning to house many new small businesses focused on environmentally

conscientious products and practices; a sprawling rooftop ‘Urban Grange’ farm that cultivates and markets produce, while serving as a natural site for collection of rainwater run-off and as an example of the greening and cooling of rooftops.

REFERENCES

- Bain, Ken. 2004. *What the Best College Teachers Do*. Cambridge, Harvard University Press
- Gowanus Canal Conservancy. <http://www.gowanuscanalconservancy.org/ee/index.php/about/>
- Kemp, Andrew T. 2006. Engaging the Environment: A Case for a Place-Based Curriculum. *Curriculum and Teaching Dialogue*, 125 – 142. Information Age Publishing
- Kuh, George D., Elizabeth J. Whitt, John H. Schuh, et al. 1991. *Involving Colleges: Successful Approaches to Fostering Student Learning and Development Outside the Classroom*, Jossey-Bass Publishers, San Francisco
- Kuh, George D. 2005. *Assessing Conditions to Enhancing Student Effectiveness: The Inventory for Student Engagement and Success*, Jossey-Bass Publishers, San Francisco
- Kuh, George D. and Carol Geary Schneider. 2008. *High Impact Educational Practices: What They Are, Who Has Access to Them, and Why they Matter*. Association of American Colleges
- Kuh, George D. 1995. *Student Learning Outside the Classroom: Transcending Artificial Boundaries (J-B ASHE Higher Education Report*, Jossey-Bass [Publishers, San Francisco](http://www.josseybass.com)
- Kudryavtsev, Alex, Richard C. Stedman, and Marianne E. Krasny. 2012. Sense of Place in Environmental Education. *Environmental Education Research*, vol. 18, no. 2 April: 229 – 250.
- Luddick, P.2001. *The Pedagogy of Place*. North American Montessori Teachers Association Journal (NAMTA), vol. 26, no. 3: 155 – 173.
- New York City College of Technology Interdisciplinary Committee. 2012. *Criteria for an Interdisciplinary Course*. <https://openlab.citytech.cuny.edu/ids/>
- U.S. Department of Energy Solar Decathlon. (2014). <http://www.solardecathlon.gov/>
- U.S. Environmental Protection Agency. May 2014. *Region 2 Superfund: Gowanus Canal – Record of Decision*. <http://www.epa.gov/region2/superfund/npl/gowanus/>
- Victor, Lauren. 2013. Making a Long-Term Impact on Students Through a Place-Based, Experiential Approach to Academics. *Curriculum and Teaching Dialogue*, vol. 15, no. 1, 2, 2013: 83 – 96. Information Age Publishing
- Zandvliet, David Bryan. 2013. PLACES and SPACES: Case Studies in the evaluation of post-secondary, place-based learning environments. *Studies in Educational Evaluation*, vol. 41 (2014): 18 – 28, Elsevier Ltd. 2013