J Environ Stud Sci (2014) 4:294–300
DOI 10.1007/s13412-014-0194-8

Learning and promoting urban sustainability: environmental service learning in an undergraduate environmental studies curriculum

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Published online: 21 October 2014

Abstract Sustainability education increasingly emphasizes experiential, high-impact learning practices, and the understanding that changes in mind-sets, values, and lifestyles are required for the sustainability of a finite planet. In this essay, I discuss service learning as a sustainability education pedagogy for teachers in higher education interested in teaching and promoting sustainability in an urban environment. I combine examples from scholarly literature with reflections from my students in an undergraduate mid-level environmental service learning course and argue that service learning contributes to teaching and learning about cities and sustainability by enriching students' understanding of urban political ecology. Service learning promotes at least three distinct goals: First, it helps students to explore intricate connections between ecological, social, and economic issues, including questions of race, gender, and class, through a real-world case study. Second, students actively participate in a democratic learning environment, where community stakeholders, students, and professors are invited to analyze, critique, and articulate what they have learned. Third, participation in service learning improves students' sense of efficacy toward achieving sustainability goals.

Keywords Sustainability education · Service learning · Experiential pedagogy

Introduction

Creating sustainable and resilient societies is an increasing challenge globally. The United Nations recognized this challenge and launched the Decade of Education for Sustainable Development (2005–2014), including the promotion of pedagogies to facilitate participatory learning, higher-order thinking skills, and sustainability projects that are locally relevant and culturally appropriate (UNESCO 2005). As highlighted by the United Nations Educational, Scientific and Cultural Organization (UNESCO 2012), sustainability education increasingly emphasizes experiential, high-impact learning practices and the understanding that changes in mind-sets, values, and lifestyles are required for the sustainability of a finite planet. A citizenship approach to sustainability, likewise, envisions the ultimate objective of environmental education as people's active involvement in the resolution of environmental problems (Tbilisi Declaration 1977; Dobson 2003) through pedagogies that enable students to see themselves as members of communities encompassing both humans and nature (Kelly and Abel 2012). As such, the implementation of environmental service learning as a pedagogical tool has proven effective for teachers in higher education interested in teaching and promoting sustainability in both urban and rural environments (Sipos et al. 2008; Ward 1999).

There exist multiple definitions of service learning. Based on Bringle and Hatcher (1995), service learning is a "course-based, credit-bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility' (p.112). Service learning is an approach to teaching and learning that pairs students with the community to bring about positive change in individuals, neighborhoods, organizations, and other larger systems in the community. Yet, it should be noted that service learning experiences are different from volunteerism, community service internships, or field experience, since it involves

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intentional efforts to engage students in planned and purposeful learning and scholarly reflection (Howard 2001). As an example of experiential learning, service learning is based on a principle of reciprocity that enables students both to contribute their academic and other skills to community while gaining skills, new knowledge, and a sense of social responsibility (Schoenfeld 2004). In higher education, service learning engages students in relevant community services for at least half a semester, ranging from typically 10 to 40 hours, as a means for achieving academic goals. Academic credit is earned for learning gained through the experience, not for the service itself. Service is linked to set learning objectives that support the course content and students critically reflect on the service being provided. The community service component comprises a percentage of the total course grade. With a formal evaluation and documentation of academic learning, service learning aims that service becomes mutually beneficial to both the student and the community (Billig and Furco 2002; Heffernan 2001). Service learning can also be part of other experiential learning tools, such as capstone experience, in which students are expected to integrate special studies with the major and extend, critique, and apply knowledge gained in their major in their senior year or toward the end of the program of study, or a study abroad program. However, by definition and in practice, not all capstone experiences or study abroad programs have a service learning component.

Service learning can be integrated into environmental studies (ES) curriculum from introductory levels to senior courses. The curricular placement depends on analyzing not only the value-added role of service learning but also student outcomes (Phillips et al. 2013). In this essay, I discuss the pedagogical mechanisms, and community, environmental, and student outcomes in relation to service learning ES courses in undergraduate higher education. Then I introduce a mid-level undergraduate environmental service learning course, Political Ecology that I taught in 2012 and 2013 in the ES Program at Skidmore College, a liberal arts college in upstate New York (USA). I describe students' service learning work related to urban forestry, climate change, and urban food movements. I examine the impact of environmental service learning through examples from scholarly literature with critical reflections from my students.[1] Several researchers have used self reports to evaluate the impact of service learning on academic achievement and find that service learning positively influences academic achievement (Gallini and Moely 2003; Markus et al. 1993). On the other hand, others caution that faculty's evaluation of their own teaching is not impartial to their own performance (Berk 2005) and students are unlikely to be engaged in critical reflection unless intentional efforts are taken to encourage students to link their experience to subject matter or to have their assumptions challenged (Eyler 2002). Therefore, the findings from the case study should be considered in line with these limitations.

Incorporating environmental service learning into an ES curriculum provides authentic learning experiences, knowledge, and skills that enable students and teachers to contribute actively in the transformation of their worlds (Hudspeth 1999; Camill and Phillips 2011; Ward 1999). Moreover, service learning serves as a bridge between academicians, practitioners, communities, and students along the path toward bolstering local knowledge, care, and sustainability (Gruenewald 2003; Kelly and Abel 2012). Environmental service learning helps students to explore intricate connections between ecological, social, and economic issues, including questions of race, gender, class, and access, through a real-world case study (Karwat et al. 2013). Furthermore, students actively participate in a democratic learning environment, where community stakeholders, students, and professors are invited to analyze, critique, and articulate what they have learned (Pribbenow 2005). Last but not least, participation in service learning improves students' sense of efficacy toward achieving sustainability goals (Sipos et al. 2008).

Environmental service learning in higher education

The service-learning course is a credit-bearing educational experience that enables students to analyze and solve community problems through the application of academic knowledge and hands-on skills. The focus on service learning has grown at every level of schooling, from K-12 to higher education in the USA, over three decades (Billig and Furco 2002; Bringle et al. 2013; Phillips et al. 2013; Ward 1999). A growing number of universities intend to educate not just a few specialists but a new generation of scholars and professionals who will be crucial in achieving sustainability solutions (Brundiers et al. 2010). Thus, ES departments and programs increasingly have included service learning as a regular and sometimes required component of their curricula. For instance, University of Vermont, The Rubenstein School of Environment and Natural Resources, uses "Vermont as a classroom" and benefits from Vermont's landscape, accessibility, government, and non-profit organizations to engage students in research, policy initiatives, and other community work. The goals are to help students "become effective environmental leaders and engaged citizens by developing problem-solving, critical thinking, communication, and professional skills" and become competent in an increasingly diverse world (UVM 2014a). At UVM, ES majors can take service learning as part of their nine credits capstone experience or other courses offered through The Rubenstein School, such as Place-Based Herbal Medicine, Land Conservation,

[1] Students completed four reflection assignments in each course. All 19 students who took the course formally consented to participate in this study.

Sustainability Education, and Ecosystem Management (UVM 2014b). In other instances, the higher education institution may require mandatory public service and the ES programs or departments offer some of these required courses. Tulane University requires all students to complete a public service requirement for graduation, which involves one service learning course before the end of sophomore year and another service learning course or other experiential learning in the junior or senior year. The Earth and Environmental Sciences Program offers service learning courses every semester that can be taken to complete the public service requirement. For example, in Earth as Living Planet service learning course, students worked with a civil society organization in New Orleans to improve energy efficiency and reduce costs and carbon emissions by switching from incandescent light bulbs to compact fluorescent lights in low-income neighborhoods. Similarly, in Shark Paleobiology service learning course, students teach a learning cycle model activity that uses fossil shark teeth, with a corresponding field teacher to meet one or more of Louisiana's K-12 science content and common core standards. The module has also been developed as part of the service learning class (Tulane University 2013).

Research on the impact of service learning pedagogy in higher education has demonstrated its positive impact on academic, personal, and citizenship outcomes by way of civic and academic engagement (Eyler et al. 2001; Conway et al. 2009; Pribbenow 2005). Lecture-centric approaches sometimes have proven limited in their ability to meet some of the key goals commonly pursued by higher education institutions, such as civic engagement and raising global citizens (Kuh 2008; Domask 2007). Moreover, a consensus has developed that sustainability education should move beyond the classroom and include various capacity building pathways to engage "head, hands, and heart" (Sipos et al. 2008; Brundiers et al. 2010). To achieve sustainability, students need to understand the ways in which theoretical sustainability principles unfold when they are applied in urban environments or in their local communities (Roakes and Norris-Tirrell 2000). Service learning enables ES students to grasp the multitude of scales—neighborhood, local, regional, national, global—at which sustainability must be considered, and how on-the-ground socioeconomic realities and injustices, such as poverty and unequal access to green space, can make addressing sustainability issues a complex endeavor (Karwat et al. 2013). At the same time, working on place-based examples offers undergraduate students a more concrete means to achieve abstract learning objectives. These outcomes are also evident in an assessment of University of Wisconsin Green-Bay students who participated in one or more of the 2003, 2004, 2005, or 2006 Costa Rica study abroad service learning courses. In their assessment of these courses through a multi-method study employing both qualitative and quantitative methods, Kelly and Abel (2012) found that the study abroad service learning experience built on students' pre-existing knowledge of local and global environmental problems, and fostered an emotional engagement with the people of Costa Rica which then created a deeper sense of understanding of environmental issues.

As the examples of service learning courses above demonstrate, service learning can take many formats, from "pure" or direct service learning to research that benefits the community (Heffernan 2001). In problem-based service learning courses, ES students can serve as consultants or subject matter experts for a community organization to provide expertise to address a local environmental problem. At Dartmouth College, students have worked on projects related to sustainability and provided recommendations for reducing energy use in college buildings and for a more sustainable campus (Hornig 1999). Bates College also followed the consultant model of service learning in assessing the effects of urbanization on Maine's watersheds. Joint presentations to city residents and city officials over the years have helped to develop options for compensatory mitigation of city's urbanization (Ongley et al. 1999). In other universities, students can link their internships with discipline-based service learning courses. At the University of Washington, students can register to an internship through the Carlson Leadership and Public Service Center and complete 3 to 5 hours per week during the semester in a designated local organization while registered in a service learning course. As an example, in Global Environmental Politics service learning source, students completed an assessment and a final paper, which contributed 30 % to the final grade besides completing regular duties assigned by the local organization as service (Litfin 2012).

Service learning can be integrated into the ES curriculum from introductory courses to capstone experiences. Environmental service learning can be used to excite interest in the major when incorporated into introductory courses. In capstone courses, environmental service learning is particularly relevant to synthesize students' understanding of their discipline and the transition from theory to practice. Other considerations in deciding the level to integrate environmental service learning include students' skills, experience, and their ability to address community needs. Similarly, faculty considerations to prepare students for internships are helpful in considering the particular placement of service learning in the curriculum (Zlotkowski 2000). At the University of Vermont, the senior capstone course enables students to work with community partners on multiple environmental issues, including environmental impact assessment, environmental risk assessment, and public involvement in environmental planning and decision making (Camill and Phillips 2011). A similar model of service learning has been employed by Skidmore College, which implements community-based research in its year-long senior capstone course. Students work on a local environmental problem, prepare a report, and present their findings to community partners at the end of the year.

Initially, the service learning projects focused on Saratoga Lake and provided an assessment of development pressures on the watershed. Skidmore ES capstone projects between 2004 and 2011 culminated in a Water Resources Initiative, which now serves as an archive and long-term assessment of the health of the Saratoga Springs watershed (Kellogg et al. 2008). However, at any level, partnering with a community organization and developing trust between the community and the higher institution is crucial for the success of service learning courses and projects (Karwat et al. 2013).

The educational rationale that leads a faculty member to employ service learning may differ from course to course, as well as the teacher's methods to integrate theory with practice. In an environmental science capstone course, for instance, students may use field research to add to the community's understanding of a local problem, such as the health of the watershed that supplies drinking water, as was the case at Skidmore College. Mapping an urban green space or invasive species might be used to identify priority areas or develop a master plan for recreational purposes (Kesler-Gilbert and Krygier 2007). In social science-based ES courses, linking theory to practice is not always straightforward and can even challenge textbook formulations of issues (Zlotkowski 2000).

One of the essential elements of service learning is that it requires reciprocity. Students, faculty, and community are all participants—learners and teachers on the same team. Assessments of both the quality of the learning experience for the students and its usefulness for the community partner are essential to service learning (Howard 2001; Heffernan 2001). Academically, both the frequency and type of reflection students engage in are crucial factors in learning through a service learning course (Molee et al. 2010). A service learning course should also allow ample time to facilitate students' reflection on their investigations of the needs of the community, their options for meeting those needs, why the needs arose, and how they are connected to the broader topics discussed by the course. These reflections can take place before, during, and after service (Billig 2010; Battistoni 2002). Through time, there has been a shift in perspective in service learning from "for the community" to "with the community," which means that the higher education institution involved in service learning has started to pay more attention to the outcomes of service learning from the community perspective, and this confirms the notion of mutual learning (Ward and Wolf-Wendel 2000).

Case study: urban sustainability through a service learning course

Here, I will examine a service learning course, Political Ecology, offered as a service learning course in Spring semesters of 2012 and 2013 in Skidmore College to discuss how environmental service learning can be used to enhance student learning, particularly on local environmental issues and sustainability. In both courses, students were required to work 15 hours outside of class with a local organization to address an environmental issue. The class assessments related to service learning included four reflection assignments, a group project, and presentation of project findings to the local organization's board members, which contributed 30 % toward the student's final grade. The course was offered as an elective course in both years through the ES program.

Students in the course used reflective journals to describe their service learning experience, examine their experience in light of learning objectives for personal growth and civic engagement, and articulated their learning based on prompted questions (Molee et al. 2010). As reflective thinking is both a process and product of learning, students learned in different ways (Cooper 1998). The reflection assignments also provided an insight on students' ability to analyze how multiple forces interact across scales to address specific environmental problems and possible solutions. Among others, the course objectives included identifying connections among diverse forces of human environment interactions and their social, political, economic, ecological consequences; analyzing how multiple forces interact across scales to address specific environmental problems and their solutions; becoming familiar with and employing interdisciplinary problem solving skills; and working with stakeholders to understand and address the complexity of urban sustainability.

In 2012, students worked with two different local organizations on service learning projects addressing urban forestry and urban alternative food systems. In 2013, the class worked on three different projects with one local organization on climate change resilience. In both courses, the instructor established prior contact with the local organizations to discuss the community needs and how students' skills could be effectively channeled to benefit both the community and the students. In 2012, students contributed to a local organization, Sustainable Saratoga's urban forestry project by inventorying Saratoga Springs' street trees using GPS units. The service learning project helped the community organization to complete the tree survey by a pressing deadline. When the project was completed, it had surveyed over 8,000 trees, with maps indicating the location and relative size of street trees, the relative density of tree cover of each of the surveyed trees, the distribution of native and invasive species trees as well as largest or historically significant trees. The surveys were then incorporated in the City of Saratoga Springs' first-ever urban forest master plan, which culminated in the appointment of a city arborist in May 2013. Students learned about access to green space, the conservation of urban forests, and its connections to housing tenure and income in class while working outside of campus to explore intricate connections between ecological, social, and economic issues. One student reported

that tree surveying helped her to consider the absence of trees in urban areas, "understand the interconnectedness of the city and nature firsthand," while another commented that he realized "how much we lack green urban spaces and how much neighborhoods would benefit from the presence of street trees." By engaging with city residents, students were able to become part of the city where they now live and integrate their academic skills into practice. These experiences inspired one student to comment "how the concerns and perspectives of the public are just as important as the trees themselves for the conservation of urban green space". Students were also able to link local urban environmental problems to larger socioeconomic issues. Commenting on discrepancies in the number of trees and quality of urban spaces among different neighborhoods, one student reflected that "Understanding the inequalities and urban ecologies allowed me to determine which aspects of conservation programs were relevant to Saratoga's community". Such observations, together with class discussions have been helpful to further analyze how different sustainability programs can be applicable and effective at the local level.

A second service project in 2012 involved a food systems project for the local organization, Mohawk Harvest Cooperative Market, in Gloversville, NY (Co-op from now on). The Co-op works with farmers to provide access to fresh, healthy, and local food in an area negatively affected by the demise of manufacturing jobs. The service learning project involved the design, implementation, and analysis of a survey that helped the Co-op to assess the expectations of its customers and members. Students used a qualitative methodology for data collection and employed online surveys, and interviews to reach out the consumers. While implementing the survey, students had a chance to observe urban and economic challenges in cities of the former industrial belt and the food security implications. One student observed that the town "had a feel of former grandeur, but closed stores showed not much changed in decades. This may explain why local people do not come to downtown and visit the market on the main street." Another commented that "the Co-op started as a reaction to the run-down situation of the town and aims to address food security in a food desert." Together with class discussions about food justice and sustainability in urban United States and alternative food movement, one student commented that she "learned a lot about starting and maintaining a green and sustainable business", another reflected that "the market was essential to the community's well-being as it provided access to healthy food while also becoming a public space for education, sustainability and community building."

In 2013, students worked with Sustainable Saratoga on three different service learning projects that assessed the climate change resilience of Saratoga Springs, a participant of the Sierra Club's Cool Cities initiative since 2009 (Sierra Club 2014). The local organization sought to reinvigorate the city's climate change adaptation policies. Students organized a community forum, wrote articles for the organization's website and in local newspaper, assessed alternative fleets and fuels, and compared city plans to help prepare a local climate action plan. Students attended city council as well as community forum meetings. These meetings gave students a first-hand chance to observe the environmental decision making process and learn about public views about sustainability issues. However, students could also observe who were part of the debates: one student commented that "the participants in the city's comprehensive plan public hearing were limited in racial diversity". The student then assessed her group assignment that involved organization of a climate change forum in the city more critically by considering, its location and methods of advertising so that it "would not exclude or marginalize any group of people." Similarly, students also started to recognize obstacles to implementing climate change action plans at the local level and reflected on local perceptions about sustainability and conflicting public support for climate change adaptation plans. Whereas a few students commented on these conflicts as "frustrating," class discussions enabled students to understand the resistance to the new comprehensive plan and the difficulty of negotiating stakeholders' interests on local environmental issues. One student commented that "Political ecology also highlights the difficulty in working with many different groups to find and attain a common goal. This is evident in the struggles Saratoga has had in appointing Comprehensive Plan committee members."

At the end of each semester, students presented their findings in a report and face-to-face meeting to the Board members of the local organization they worked with. These presentations held students accountable for the quality of their project. A student commented that "In sharing my research and watching [the Board] listen intently to my presentation, I was comforted that my work had value in the community and would truly be useful in future decision-making." The presentation, a mutual learning experience for the students and the community organization, allowed the community organization to become familiar with the ES curriculum and the knowledge students have on environmental issues. Several students noted that they felt "comforted" that their "work had value in the community," "empowered" to know that they "have the tools to influence sustainability policy in Saratoga Springs," and "confident" that "the community respected the input of college students".

Conclusion

One of the challenges that ES instructors face is not just conveying the urgency and global character of environmental crises, but how to convey these issues in a way that is

meaningful and actionable for students at a local level. Service learning courses in ES curricula offer a means to teach about sustainability and make students protagonists in the learning process by focusing on their capabilities to address urban and local sustainability challenges. A service learning course links academic content to service to address community needs. This focus challenges both the instructor and the students and provides new opportunities in sustainability education (Zlotkowski 2000). Moreover, service learning can also serve as a link between global ideas and sustainable development at the local level (UNESCO 2012).

The literature and the student reflections from an undergraduate environmental service learning course suggest the potential that service learning contributes to teaching and learning about cities and sustainability. Students become more aware of nature in their urban environment and explore intricate connections between ecological, social, and economic perspectives, including issues of race, gender, and class, through a real world case study. Thus, service learning serves as a bridge among academicians, practitioners, and students along the path to sustainability. Students actively participate in a democratic learning environment, constantly apply concepts from their classroom to their service learning project, reflect on their work, and analyze their findings and the outcomes of their project. Students recognize that even small actions can contribute to urban sustainability and their voices and actions make a difference in the city they now live. As participation in service learning improves students' sense of efficacy toward achieving sustainability goals, it helps to solve real problems within society, combining student service and academics for a greater common purpose. In the words of one student, "service learning projects gave me a chance to examine the real world implications of some of the material we have been studying." As the consensus on sustainability education also highlights, sustainability education requires experiential, high-impact learning practices, and changes in mind sets, values, and lifestyles. Service learning challenges the teachers to acknowledge their role in developing values, such as ethical responsibility and leadership, and see the community as a co-teacher. On the road to sustainability education, service learning also enables teachers and students to work collaboratively and to learn from the complex challenges within a given community, especially in relation to urban sustainability.

Acknowledgements I would like to thank Andrew Schneller, and James C. Helicke for thier thoughtful comments. I also would like to thank the editors of this special issue for their helpful feedback.

References

Battistoni R (2002) Civic engagement across the curriculum. Campus Compact, Providence

Berk RA (2005) Survey of 12 strategies to measure teaching effectiveness. Int J Teaching Lear High Educ 17(1):48–62

Billig S (2010) Five rules separate high-quality service learning from community service. Princ Leadersh 26–31. www.principals.org. Accessed 15 March 2014

Billig SH, Furco A (2002) Service-learning through a Multidisciplinary Lens. IAP

Bringle RG, Hatcher JA (1995) A service learning curriculum for faculty. Mich J Community Serv Learn 2(1):112–122

Bringle RG, Clayton PH, Hatcher JA (2013) Research on service learning: conceptual frameworks and assessments. In: Clayton RG, Hatcher JA (eds) IUPUI series on service learning research (1st ed., Vol. 2A). Stylus Publishing, Sterling

Brundiers K, Wiek A, Redman CL (2010) Real-world learning opportunities in sustainability: from classroom into the real world. Int J Sustain High Educ 11(4):308–324

Camill P, Phillips K (2011) Capstones and practica in environmental studies and sciences programs: rationale and lessons learned. J Environ Stud Sci 1(3):181–188

Conway JM, Amel EL, Gerwien DP (2009) Teaching and learning in the social context: a meta-analysis of service learning's effects on academic, personal, social, and citizenship outcomes. Teach Psychol 36(4):233–245

Cooper D (1998) Reading, writing and reflection. In: Jones S (ed) Introduction to service-learning toolkit: readings and resources for faculty (2nd ed; 2003). Campus Compact, Brown University, Providence, pp 91–96

Dobson A (2003) Citizenship and the environment. Oxford University Press, New York

Domask JJ (2007) Achieving goals in higher education: an experiential approach to sustainability studies. Int J Sustain High Educ 8(1):53–68

Eyler J (2002) Reflection: linking service and learning—linking students and communities. J Soc Issues 58(3):517–534

Eyler JS, Giles DE Jr, Stenson CM, Gray CJ (2001) At a glance: what we know about the effects of service-learning on college students, faculty, institutions and communities, 1993–2000. Vanderbilt University, Nashville

Gallini SM, Moely BE (2003) Service-learning and engagement, academic challenge, and retention. Mich J Commun Serv Lear 10:5–14

Gruenewald DA (2003) Foundations of place: a multidisciplinary framework for place-conscious education. Am Educ Res J 40(3):619–654

Heffernan K (2001) Fundamentals of service-learning course construction. Campus Compact, Brown University, Providence

Hornig J (1999) An undergraduate course as a consulting company. In H.Ward (ed). acting locally: concepts and models for service-learning in environmental studies. AAHE, Washigton, pp 13–23

Howard J (2001) Michigan journal of community service learning: service-learning course design workbook. OCSL Press, Ann Arbor

Hudspeth T (1999) Service-learning in environmental studies at the University of Vermont through a senior capstone course on environmental problem-solving and consulting. In: Ward H (ed) Acting locally: concepts and models for service-learning in environmental studies. American Association for Higher Education, Washington, pp 157–165

Karwat DMA, Sherman LS, Cole L, Badiane KC, Coseo PJ, Larsen LS (2013) A lesson in service learning and community engagement. Mich J Sustain 1:151–159

Kellogg KA, Bailey RJ, Cock-Esteb A, Dodge NS, Ennis-McMillan M, Halstead JA, Nesbitt BK, Nichols KK, Turner RC (2008) The Water Resources Initiative (WRI) at Skidmore College. National Center for Science and Civic Engagement, Science Education for New Civic Engagements and Responsibilities: 6–7

Kelly JR, Abel T (2012) Fostering ecological citizenship: the case of environmental service-learning in Costa Rica. Int J Scholarship Teach Learn 6(2):1–20

Kesler-Gilbert M, Krygier J (2007) Mapping campus-community collaborations: Integrating partnerships, service-learning, mapping and GIS. In DS Sinton, JJ Lund (eds.) Understanding place: GIS and mapping across the curriculum, pp 63–75

Kuh GD (2008). High-impact educational practices: What they are, who has access to them, and why they matter. Association of American Colleges and Universities

Litfin K (2012) Course syllabus; political science 384 / environment 384 global environmental politics; fall 2012. University of Washington, Karen, https://catalyst.uw.edu/workspace/file/download/00fc9ce158dbd3e5503b3edf9e3d9bd7e4aee35bfcc37ef7ac6e3757172f0cfc. Accessed 31 August 2014

Markus G, Howard J, King D (1993) Integrating community service and classroom instruction enhances learning: results from an experiment. Educ Eval Policy Anal 15:410–419

Molee LM, Henry ME, Sessa VI, McKinney-Prupis ER (2010) Assessing learning in service-learning courses through critical reflection. J Exp Educ 33(3):239–257

Ongley LK, Bohlen C, Lathrop A (1999) Evolution of the consultant model of service learning, Bates College. In H Ward (ed), Acting Locally: Concepts and Models for Service Learning in Environmental Studies, part of American Association of Higher Education's Series on Service-Learning in the Disciplines, pp. 39–52

Phillips A, Bolduc SR, Gallo M (2013) Curricular placement of academic service-learning in higher education. J High Educ Outreach Engagement 17(4):75–96

Pribbenow DA (2005) The impact of service-learning pedagogy on faculty teaching and learning. Michi J Commu Serv Learn 11(2):25–38

Roakes SL, Norris-Tirrell D (2000) Community service learning in planning education a framework for course development. J Plan Educ Res 20(1):100–110

Schoenfeld RM (2004) Service learning guide and journal: higher, Educationth edn. Guide and Journal Publications, Seattle

Sierra Club (2014) Cool Cities Campaign. http://lomaprieta.sierraclub.org/cool_cities/index. Accessed 31 August 2014

Sipos Y, Battisti B, Grimm K (2008) Achieving transformative sustainability learning: engaging head, hands and heart. Int J Sustain High Educ 9(1):68–86

Tbilisi Declaration (1977) Intergovernmental Conference on Environmental Education organized by UNESCO in co-operation with UNEP Tbilisi (USSR) 74–26. http://unesdoc.unesco.org/images/0003/000327/032763eo.pdf. Accessed 30 March 2014

Tulane University (2013). Public Service Historical Course Catalog 2014–2015. http://tulane.edu/cps/students/upload/Public-Service-Historical-Course-Catalog_Updated-7-29-14-2.pdf. Accessed 31 August 2014

UNESCO (2005) Contributing to a More Sustainable Future: Quality Education, Life kills and Education for Sustainable Development. ED/PEQ/IQL/2005/PI/H/2. UNESCO Division for the Promotion of Sustainability Education

UNESCO (2012) Shaping the Education of Tomorrow 2012 Report on the UN Decade of Education for Sustainable Development, Abridged Original Report authored by Arjen E.J. Wals; Abridged version prepared by Cathy Nolan)

UVM (2014a) University of Vermont, the Rubenstein School of Environment and Natural Resources, The Office of Experiential Learning. http://www.uvm.edu/rsenr/?Page=experiential/experiential.php&SM=servicessubmenu.html. Accessed 28 August 2014

UVM (2014b) University of Vermont, the Rubenstein School of Environment and Natural Resources, Service Learning Courses at RSENR. http://www.uvm.edu/rsenr/?Page=experiential/courses.html&SM=servicessubmenu.html. Accessed 28 August 2014

Ward HR (1999) Why is service learning so pervasive in environmental studies programs? In: Ward H (ed) Acting locally: concepts and models for service-learning in environmental studies. American Association for Higher Education, Washington, pp 1–12

Ward K, Wolf-Wendel L (2000) Community-centered service learning moving from doing for to doing with. Am Behav Sci 43(5):767–780

Zlotkowski E (2000) Service-learning in the disciplines. Michigan Journal of Community Service Learning, Special Issue 61–67