Exploring Natural Resource Professionals' Perspectives About Engaging Undergraduates as Environmental Educators

Jody Schmidt and Julie Smith

Abstract

Little is known about how community partners perceive service-learning partnerships. Urban universities are increasingly implementing the pedagogy in the environmental sciences. In order to recruit and sustain connections to community partners, it is necessary that the community partners see the relationship with the university as beneficial to fulfilling their agency's mission. This qualitative research explores the experiences of five community partners who engaged college seniors enrolled in a Capstone course as K-12 environmental educators.

Within the Portland, Oregon, metropolitan area, there exist organizations dedicated to preserving and maintaining remnant native ecosystems in the urban context. Their mission is dependent on not only appropriate natural resource management, but also on environmental education programs that impress urban residents with the importance of these fragile areas. Among the target populations are K-12 students. Many of these programs engage upper division college students as K-12 environmental educators through service-learning partnerships with Portland State University (PSU). These partnerships may serve as a framework for other agencies wanting to do educational outreach faced with similar challenges of limited human resources. However, before undertaking such a partnership it is essential to explore, from the partner's perspective, the challenges and rewards of having undergraduates work in the community as environmental educators.

Though information about partners' perspectives has not received much attention in the service-learning literature , emerging evidence indicates that, in general, service-learning offers benefits to the community partner through budgetary savings, a renewed sense of enthusiasm and energy, improved client services, greater access to university resources, satisfaction in preparing future professionals, and enhancement of organizational goals. Partnerships also contribute to programmatic structure, improved management techniques and improvement in the partner's community image.

Amid these benefits, though, some partnerships struggle with ill-prepared students who hold unrealistic expectations about their service experience, attend inconsistently, and commit for too little time to make a meaningful difference. These factors may lead community partners to question the reciprocal nature of university partnerships with their organization. The process of reciprocity is essential to the definition of service-learning. Reciprocity implies a mutual gain to student and community partner as an outcome of participation in a service-learning project. Jacoby (1996) elaborates on the importance of reciprocity:

If there is a fundamental or comprehensive concept that has driven efforts to achieve high quality in the combining of service and learning, it is reciprocity. Reciprocity suggests that every individual, organization, and entity involved in service-learning functions as both a teacher and a learner...The degree to which we enter the service-learning endeavor committed to reciprocal relationships will determine whether we move the academy away from seeing the community as a learning laboratory and toward viewing it as a partner in an effort to increase each other's capacities and power (pp. 35-36).

The growth of service-learning as a higher education pedagogy has created a growing demand for community partners. Within the environmental education field there is also a growing demand for educational partnerships. In the last 20 years many environmental agencies have extended their missions to include educational outreach in addition to natural resource management. Natural resource professionals have sometimes found this new mission challenging due to a lack of training as educators. Many were not prepared to socially interact with students, and within their occupational culture, some consider education to be less respectable than the hard sciences. Over the years though, as natural resource managers have become more experienced educators, their skills at public speaking, professional networking and understanding the impact of different learning styles and classroom restraints have improved.

Reciprocity has been shown to exist in partnerships where college students serve as educators because college students are seen as good role models who can foster positive academic change in youth. Role modeling within environmental education is particularly important, because sharing time with at least one adult who teaches both respect for nature and spending time in the outdoors are the two most common factors that contribute to environmental awareness development. Mentoring in environmental education can also promote personal and professional leadership for both mentors and those mentored.

Over the years, service-learning has been shown to benefit students through enhanced academic learning, personal development, interpersonal skills, understandings of diversity, feelings of social responsibility and citizenship. And yet, our understanding of the rewards and challenges to community partners is less well documented. The purpose of our study is to add to the body of knowledge about partner perspectives by interviewing natural resource managers who engage undergraduates as K-12 environmental educators. These natural resource professionals offer a wealth of knowledge

about the value of working with students as educators and can help build a base of understanding that is presently lacking.

Methods

Participants in this exploratory, qualitative study include five natural resource agency professionals who have participated in service-learning partnerships where PSU Capstone students worked as environmental educators for their agency. A Capstone course is the culmination of PSU's nationally recognized general education program administered through the Office of University Studies (UNST). The six-credit service-learning course helps meet the UNST program goal of ethics and social responsibility, whereby, "Students expand their understanding of the impact and value of individuals and their choices on society, both intellectually and socially, through group projects and collaboration in learning communities." Each Capstone class forms an interdisciplinary team of students who apply the knowledge gained through their college experience to real-world issues.

Currently there are more than 80 Capstone classes offered across many academic disciplines. For the purpose of this paper, community partners from urban natural resource agencies where Capstone students served as environmental educators were selected. They represent a cohort of partners with similar experiences and who would probably have common expectations of the Capstone students. Additionally, the general structure for each of these Capstone courses is approximately the same. The partnerships were initiated when instructors at PSU, who were interested in environmental education, contacted the agencies. The instructor and community partner worked out individual responsibilities. Typically, the PSU instructor developed introductory lessons and assignments at the university, but when students moved onsite, the partner took on the leadership role.

The participants in this project are described in Table 1. All of the community agencies are located within an urban area and provide educational programs to K-12 populations.

Table 1. Background information of community partners

#	Pseudonym	Position	Community Agency	Years in agency	Prior Capstone experience	Years as Educator
1	Charlie	Executive Director	Municipal	13	Yes	20+
2	Sarah	Educator	Municipal	10	No	21+
3	Eric	Program Coordinator	Municipal	7	No	14
4	Kim	Executive Director	NGO	7	Yes	25
5	April	Program Coordinator	NGO	4	Yes	4

To gain an in-depth understanding of the community partners' shared experiences, a qualitative case study was implemented. Data was collected through five semi-

structured, hour-long in-person interviews. A week before the interview the participants were provided with a list of questions to encourage reflective thinking about their partnership. The questions were designed to elicit open-ended narratives concerning the partners' perspective; however, the actual interviews took on a flowing conversational tone. Samples of the prompts can be viewed in Table 2. The interviews were recorded, transcribed, and the data were content analyzed using an "open coding" approach described by Strauss and Corbin (1998). The inductive method involved continuously reading the transcripts and identifying reoccurring topics that were labeled with a code and defined. The codes were compared across all five interviews for emergent themes.

Table 2. Example of Interview Prompts

How did your expectations for the Capstone course tie in with your agency's mission?
Were the outcomes of the partnership in line with your mission statement?
Did the students help you reach your goals?
What was the agency able to accomplish that it would not have without the Capstone partnership?
A component of service-learning is the idea of reciprocity. What were your benefits and costs to the partnership?
In addition to the agency's benefits, do you feel that you personally benefited from the partnership?

Study Limitations

As previously stated, the study population was confined to community partners at natural resource agencies that engaged Capstone students as environmental educators. In four of the five Capstone courses, the faculty partner is involved with the Center for Science Education, the same departments as the researcher. Additionally some of the partnerships were created as a result of previous associations outside of the academic program. These two factors may have influenced the community partners' responses.

Results

Each interview began with a discussion about the agency's mission statement. Our goal was, in part, to investigate whether and how Capstone students helped community partners meet the educational component of their mission statement. Discussion about the mission statement served as a starting point to understanding the value of the student to the organization and its mission. All of the organizations have mission statements that include promotion of environmental awareness through educational programs. The participants personally see these programs as a means of increasing local civic interest in protecting natural areas. These feelings are summed up by Charlie's organization's mission statement, which, he says, "fits on a t-shirt: Connecting Water, Wildlife and People."

Coding revealed similar themes across all five interviews, which we organized into three overarching categories: (1) Capstone students may contribute to natural resource

agency sustainability; (2) The role of the Capstone student exists outside the normal continuum of labor, thus the students must be situated as environmental educators within the agency, and (3) Partnerships require melding the university Capstone curricular structure with that of the community partners' organizational structure.

Capstone Students May Contribute to Natural Resource Agency Sustainability

The goal of these organizations is to continue preserving and maintaining remnant native ecosystems in the metropolitan area long into the future. Students contribute to the long term sustainability of these environmental organizations in a variety of ways. First and foremost, the natural resource managers we interviewed saw the Capstone students as people with the potential to become civically engaged citizens through partnering with their organization. Over the long term, partners felt that Capstone students, by participating as educators, developed a deeper sense of environmental awareness, which could carry over into future life decisions. The partners hoped that the students might grow to be future volunteers and even leaders in the natural resource management area. All addressed this issue to some extent. For example, Kim said, "I know there are a lot of them (Capstone students) who have valued this experience and that as they mature, finding ways to stay connected with it becomes an important part of their lives." Kim continued, illustrating the reciprocal nature of Capstone student involvement leading to strengthening the agency:

"Well one of the things is if we are going to be able to offer these programs forever... With the Capstones, having those extra students who can support those programs and make them so much stronger. They are a tremendous contribution to the sustainability of our program. Having this connection where we can continue into the future is wonderful."

In addition to becoming civically engaged, the Capstone students become a part of the process of raising the environmental awareness of others through mentoring younger students. The partners see their mission directly benefiting in this area from the Capstones students. The student's enthusiasm and practices of inquiry were contagious to the younger students.

Charlie: It might be that one Capstone student that picks up a fir cone and really enthusiastically to a kid says, "Hey, look right inside here, that's where the seeds are." That might just be the spark that makes the kid go "I love nature, nature is my life!"

Sarah: The middle school students really liked working with the college students. I'm an old woman to them, but the Capstone students are cool. When the Capstones show enthusiasm, it's contagious to the students.

April: I think the [Capstones] add to their (K-12 students") confidence because they have the support to think, "I can do this," science, math, or even the physical challenge of walking through the forest.

Another factor that contributes to sustainability is maintaining high quality educational programs through assessment. However, program assessment tends to be time and labor intensive. Most natural resource personnel who manage natural areas plus provide environmental education do not always have the time or tools needed to develop and implement an assessment program. Two of the agencies had Capstone students conduct assessments of their pre-established educational programs in addition to teaching. When Eric designed his Capstone program he realized, "I'm going to have five or six people here one whole day a week. . . It's an excellent opportunity to have them help design the whole thing (assessment tool) and they will have time to go out to the schools and follow up on it."

On a practical basis, Capstone students also support existing programs. Their presence allowed for smaller group sizes and increased security. The younger students received more attention and thus a higher quality of education. Further, Capstones contributed to the development of teaching aids and educational materials. Most of these are reusable and contributed to the agencies' educational assets.

Sarah: One student really knew about soils – soils were her thing. She developed lessons that extended the content I had already developed. Some other students created a hydrology map that I wouldn't have had the time to do myself. Since I worked with the same students in the same field location week after week, the consistency really allowed us to develop strong programs

Charlie: One of them put together a really cool 3D model of a habitat scene. Her father builds models in Hollywood. Another student put together a really nice laminated guide on plants and animals in the preserve.

Raising awareness, role modeling for youth, providing educational materials, and assessment are important to program sustainability. Equally as important were the bonds that formed between the community partner and the Capstones. Partners have enjoyed the sense of community that came about as a result of their participation with Capstones; bonds of friendship that, in some cases, extended beyond the academic year. Said April: "Then there is that personal level – having people around that you really enjoy."

The role of the Capstone student exists outside the normal continuum of labor, thus the students must be situated as environmental educators within the agency. Emergent from the interviews is the idea that the Capstone role exists outside the normal continuum of labor. They are neither employees nor volunteers and come to the agency with different levels of skills and interests. Finding a way to situate them in this type of setting can be challenging. At times the interviewees compared the Capstone students to volunteers and at others held them to expectations of employees. Our data showed an apparent lack of clarity as to what the role of the service-learning student should be within the agency. Partners therefore had to make a conscious effort to understand the Capstone students and place them in situations where they could perform successfully. Student performance is particularly important in educational

settings because the Capstone student is representing the public face of the agencies. The interviews revealed that students needed training in public professionalism, as evidenced by issues surrounding language, conduct and appearance.

Sarah: The Capstone students didn't always use middle school level language and it overwhelmed the younger students.

Eric: Some of the people in the office complained about the noise. The higher the level of administration the more the noise bothered them.

Charlie: You know we don't have a rule, but its kind of a certain level of common sense. It's hard to explain. The way a person is dressed or appears. . . is it disruptive to the learning situation? Is it pulling away from the learning process? So if you have lots of dangly things in your cheeks and the kids are drawn to it more than paying attention to the snakes.

As an outcome of these issues, interviewees realized the need for initial training and on-going mentorship for Capstone students. Their training programs include discussions of science content, teaching methods, professionalism, and job responsibilities. Kim described how she teaches the concepts of environmental education to the college students, by relating directly to their previous experiences. Her goal is for them to understand the essence of environmental awareness and then instill this in the youth they teach.

Kim: I try to get something from them about their relationship with the outdoors and the natural world, where that came from, what experiences they've had. So they start off writing a reflective paper: "How I feel about nature and being out in the outdoors." Then we do a discussion on it, about where their experiences came from.

Kim explained how she encourages the Capstone students to use similar constructivist approaches to connect with the younger urban students they will be teaching. To mentor the university students in their role as environmental educators, Sarah spent at least 40 minutes after each teaching session to debrief with the Capstones about how the lessons went. She provided the students practice, feedback, and time to reflect. While this was a large time investment, in return, the Capstones put that information into practice and provided increasingly better environmental education programs for her agency.

In effort for students to understand their role in the agency, all interviewees stressed the importance of clearly outlining his or her expectations early in the training process. This step was necessary because the consequence of students performing inadequately directly affects the agency.

Kim: I think the thing is having people understand their true responsibility to the programming. This is not a casual thing. You don't miss class; when you sign up to do

something you have to be here, period. [I am the one responsible for] making sure I can define the consequences if they are not here. Every now and then I'll have a student who really doesn't have a background. We do all the training, you don't have to have a science background. They learn a lot of science in this class. But every now and then I'll get a student who just doesn't get it and figuring out how to work with them so they can be successful but I don't jeopardize our program can definitely be a challenge. I've learned to very explicit in that first class: This is what is going to be expected of you and if you feel you can't do it you need to go find another Capstone. I don't get defensive anymore.

Charlie: We can't afford to have anybody out here to have a bad experience. We put that ownership on the Capstone students too, so they are responsible to know the information and be in a certain behavior mode.

Partnerships Require Melding the University Capstone Curricular Structure with that of the Community Partners' Organizational Structure

Though community partners perceived many benefits from working with Capstone students, there were several factors that arose as impacting those benefits. Many of the factors became apparent as two program structures melded into one service-learning class. Most significantly, Capstone classes are comprised of students from different academic disciplines. They must apply skills learned from their individual academic major to a collaborative project. The partners see this as both useful and challenging. While the goal of collaboration and sharing expertise does work, the environmental education Capstones requires a certain level of science and education knowledge. All of the partners expected to provide training to the Capstones, however, different background levels often made it difficult to address everyone's needs and interests.

Additionally, an individual student's background knowledge dictates what types of projects the partner can design. Because project planning takes considerable time, the mixed majors can be particularly problematic when students are allowed to register on the first day of class, leaving the total number of students and their academic disciplines an unknown until the term has already begun. Eric explained how the appointment of students with different majors requires him to utilize the students differently than he would otherwise to complete the needs of his agency:

Eric: Sometimes I think a shortfall of the program is that is it not major specific. If I want to be effective in a job setting, I'm going to recruit different people who fulfill the needs of the team. I'm not going to recruit an artist to do a habitat restoration; it just doesn't make sense. It's a waste of my time to train two people. If I had four biologists, I would have given them another project and sent them out in the woods. Sometimes you don't have that much flexibility.

Ideally students will choose a Capstone class based on their major and personal interests. However, as with most classes, some are enrolled because it is a graduation requirement and a particular class fits into their schedule. Sarah described working with multiple levels and interests in relation to the benefits she receives:

Sarah: Several of the students came in with a large amount of science background. . . Most of the work the students did was really good, but sometimes there was a problem with quality control. I needed to look over everything before it was given to the middle school students. One student made a wetland plant wheel that was incorrect. She isn't a plant major, but it was clear that she also didn't put much effort into it.

How well the mixture of academic backgrounds will mesh is dependent on the students' interest in the class and willingness to participate. Student attitude plays a significant role.

April: I think it works as long as they have an interest in what we are doing and a drive to learn about it. That's how we treat our volunteers too. If someone is not an expert in a certain field but has interest in it, then that's ok. Often we find that those people make really good mentors because they are willing to learn along side of the students. I think sometimes when you know a lot about something you want to just tell someone. We like the kids to try and figure out on their own. When you don't know something, you learn with the kids and can guide them along that way. So in some ways it can be a benefit.

Eric: I think the hard part is dealing with the people part. Some of the students were interested in the project and had a good time; it was a fun environment. But sometimes I felt like they didn't have the same level of dedication as I might, because I'm the person that is going to have to deal with the results later. (For example) the assessment they completed for me was useful, but it was not scientific. Because it was not professional level quality, I don't think my administrators are as supportive of it. . . I was expecting an executive summary at the end of the term. I got some data and graphs but not a summary. The students told me that they would get it to me, then the rush of finals and the students were gone. I wasn't able to hold it over their heads since I didn't have control over the grading.

The programmatic impact of mixing majors requires flexibility on the part of the community agency. Charlie cited the following example, "Once we found out that half of them didn't want to [teach] then we adjusted the program and it evolved. We invested a good number of them in other projects and activities." This flexibility is also needed when dealing with an urban student population who is older than the traditional college age student and who often works and has family responsibilities.

Kim: Understanding the students and understanding where they are coming from and realizing how, assumptions that I made: of course they are seniors in college, they are ready to do this. They were not ready to do it in the way that I thought they could! So

understanding how much framework I had to put down for them so they could be successful for what they were doing and still give them the ownership that is truly their project. I think that was my biggest problem initially, figuring out how to structure a really successful program.

Additionally, community partners must be aware that the structure of higher education courses includes defined class times and holidays. Often community agencies do no follow the same agenda and must plan their projects accordingly. The Capstone class is six credits, which may be a significant amount of the academic school year, yet it is a small time commitment compared to the life of an agency. How the partner situates the student's time is a factor in the type of work service-learning students can successfully accomplish. Both Charlie and Eric prefer having a structured time frame.

Charlie: One nice thing about Capstones is that you know they are going to be here for three months or six months. With volunteers you don't know if they will be here for three months, one day or 10 years.

Eric: I don't think of the students as free labor, like many people view volunteers, but rather as skilled help. If I was only going to work with them for a day I might send them out to pull invasive species. However if I know that I'm going to work with them for three months I can plan projects that we can work on together; where their academic skills will really be useful.

Other codes related to melding two programmatic structures were developing partnerships, grading and pay. The establishment of partnerships was usually the result of a pre-existing relationship between a faculty and someone within the partnering agency. One partner commented that after hearing horror stories about other Capstone programs she would have never participated had she not already known and trusted the faculty person. This situation may be both beneficial and restrictive, limiting the number of future Capstones and other potential partnerships for the partnering agency. All interviewees stated that they were interested in participating in additional Capstone partnerships, some in subject areas outside of education. However, they were not aware of how to go about expressing their interest to the university in order to develop a new class partnership.

Along with relationship development is deciding how responsibilities will be shared between the faculty and the community partner. Several partners were faced with a lack of quality student work and no tool to use as a consequence. "It's like if you are teaching a class you expect them to prepare for the test, I just can't make them because I don't have control of the grading," said Eric. Others felt similarly, but when asked if they would like to have grading responsibilities, each respondent was hesitant to answer recognizing that it would add to the level of complexity of their interactions with the students.

Recognizing that partnerships provide benefits as well as costs to the partner, an ideal partnership will be reciprocal and maximize the benefits for all involved. This becomes another multifaceted topic when it comes down to concretely paying the costs. Kim, who is both the partner and instructor, does get paid and recognizes that:

Kim: Since I get paid as the professor for it, which balances out a lot of our time costs. We could not have this good of program if I weren't the professor. If I had another person here trying to do the training, it would not work nearly as well, because of our intimate knowledge of our program and what we are trying to accomplish.

Charlie, who does not get paid, recognizes a considerable use of his resources: teaching time, supplies and occupying staff. The work he places into developing the Capstones is comparable to that of the instructor, and thus he would have liked to receive some financial compensation. On the other hand, April is extremely happy with the level of benefit she receives. Overall, programs with time and supplies built into their pre-existing budget and that have education as part of their mission statement, felt less need for compensation. The partners also recognized additional benefits beyond the immediate relationship.

Eric: I think a lot of times, with these things, any community volunteer program, you sort of balance two things. One is how much work am I getting out of them, the volunteer, and how much am I putting in? Sometimes you ask yourself: well would this have been easier if I had just done it myself? And sometimes the answer is yes! (On the other hand), when you invest in a group of people like that, its not just, what do they give to me? Granted that has to be factored in because of financial realities. I'm paid to do a certain amount of things in a day and if I don't get those done, well. . . On the other hand I think you instill in people a certain feeling of accomplishment or contribution which sometimes is more long lasting and ultimately useful for an organization.

Considering the usefulness of the Capstones to the agency, at the conclusion of the interviews each participant was asked: (1) if they would participate in another Capstone, (2) if they would recommend a partnership to other people within their agency, and (3) if they would recommend participating in service-learning partnerships to other agencies. The answer to every question was an enthusiastic, but conditional yes. The hesitancy to suggest service-learning partnerships to others includes many of the reasons already presented. However, unique to this study is that all participants were educators, as well as natural resource managers. Sarah attributed a major part of her success in working with Capstone students was due to her 10 years of experience as an environmental educator. She stressed the importance of having a community partner who is nurturing and patient enough to foster a group of students. This sentiment was shared by Eric who noted, "I think for me as an educator and person that knows college students and knows the audience, it was a lot easier to deal with the Capstone students and set up realistic expectations, than let's say my boss, who is more of an administrator."

Discussion

The purpose of this study was to explore community partners' experiences when engaging undergraduate students as environmental educators. Our findings suggest that the natural resource agency personnel interviewed see these partnerships as both challenging and beneficial. Similar to other natural resource managers , our interviewees shared the belief that students contributed to program sustainability. Sustainability, as defined by our interviewees, is the ability to provide on-going high quality education and conservation programs. Sustainability depends on a citizenry that understands the importance of and connects with these organizations' mission. Trelstad (1997) shared the importance of this progression, "the process of building a constituency of young people who understand environmental problems at the community level may turn out to be more important than the scientific advancements that we also need to reverse our present and unsustainable course". Equally important as the Capstone students' personal development as citizens was their influence on the younger students. As Vernon and Ward (1999), the natural resource managers in our study felt the Capstone students served as enthusiastic role models. The partners viewed their energy as a long term investment, potentially instilling the younger students with a sense of civic and environmental awareness as they grew older (See Figure 1).

Figure 1. Community partner participates in Capstone program as an investment.

Community agencies mentor Capstone students as environmental educators

Capstone students provide educational services to Partner through assistant teaching in the field.

Smaller groups lead to higher quality of education and more individualized attention. Resulting in a greater awareness of nature and development of community.

Greater awareness of nature and development of community leads to students participating in civic engagement and caring about their environment.

Educated future volunteers

Sustainability of Community Agency: Investment pays off

The second finding, that the Capstone students' role exists outside the normal continuum of labor, has implications for others hoping to incorporate service learning into their environmental education programs. Students who participate in these service learning projects are neither volunteers nor paid employees. The challenges faced by the natural resource partners in this study were similar to those faced by others who have integrated service learning students into their organization; they include college students' inconsistent schedules and a tendency by some to not fulfill agreed upon responsibilities (Vernon and Ward, 1999). Our interviewees found it difficult to motivate some students, because they had no input on students' grades. Because there has been little published about the role of partners and grading this might pose an interesting research focus. In our study, where Capstone students acted as environmental educators, the problem of the students' short time commitment as seen in

Vernon and Ward (1999) was actually shown to be beneficial. For our interviewees, a short time frame proved advantageous, because the Capstones worked primarily with public schools that have similar academic schedules. Additionally, environmental education tends to work around shorter time schedules (fall and spring term) due to weather constraints.

Participants in our interviews attributed successful student training to the student's motivation, as well as, the mentoring students received on-the-job. As noted by our participants, even though students may not have had a science or education background, if they were self-motivated, most could learn the skills needed to be successful. One way all dealt with determining student motivation was to set forth their expectations of the students on the very first day. If a student was not up to the task, they were free to leave. Several of the partners believe the success of their partnerships were in part due to their experience as educators. Findings by Bainer (2000) and Magill (1992) suggest that natural resource professionals without an educational background may be less successful collaborating with students. The educational abilities of the community partner may directly affect how well they mentor, or train, the Capstone students to be environmental educators. We saw with several interviewees that they used a constructivist approach to training by connecting content material and activities to the student's own experiences and by demonstrating at the same time pedagogies that the Capstone students might employ with their younger charges.

Not only must potential partners consider how to situate the students, but also how to "meld" two often different organizational structures, as we saw in our third finding. An important challenge to partners was the fact that Capstone classes are composed of mixed majors. Though no apparent solution exists for this issue, partners have negotiated a compromise by creating effective training programs and laying out clear expectations early in the class. Mixing majors may be beneficial, though, particularly while participating in environmentally focused service learning courses because solving environmental problems requires cross-disciplinary cooperation. The issue of mixing majors connects tangentially to the fact that many of the partners did not know enough about the Capstone program to organize a class of their own. PSU does allow some instructors to create Capstone course descriptions that strongly urge students from specific majors, like biology or education, to sign up for their class.

On balance, most of our interviewees invested in service learning projects toward the future benefit of having a more environmentally aware citizenry who are inclined to show their civic engagement through supporting local environmental programs. Immediate benefits included extra help working with younger students and with cultivation, potential help with developing curricular materials and with assessment. However, these benefits came at a certain cost in terms of time and resources. Capstone students need mentoring and supervision and partners often spend their organizations' funds to augment the students' experience. And yet, each person interviewed said they would partner with the university again to bring Capstone students into their K-12 environmental education programs. They also recommend

these types of partnerships to others with the caveat that they understand the time and patience needed for the program to be successful. Though our study was narrowly focused, it is nevertheless important and applicable because of the growing need for environmentally focused university-community partnerships. Our research suggests that a reciprocal relationship can add to community agency sustainability as well as future educated and engaged citizens. It can also be an effective strategy for natural resource agencies to fulfill their educational mission.

References

Abravanel, S., "Building Community Through Service-Learning: The Role of the Community Partner." Issue Paper, Civic Engagement and Service Learning (April 2003) (electronic journal, http://www.ecs.org/clearinghouse/44/03/4403.pdf).

Alberts, B., and J. Tuomi, "Educating Students for the 21st Century," *On Common Ground 4* (Spring 1995): 6-7.

Astin, A., and L. Sax, "How undergraduates are affected by service participation," *Journal of College Student Development 39* (1998): 251-263.

Bainer, D., D. Cantrell and P. Barron, "Professional Development of Nonformal Environmental Educators Through School-based Partnerships," *The Journal of Environmental Education 32* (2000): 36-45.

Chawla, L., "Children's Concern for the Natural Environment," *Children's Environments Quarterly 5* (1988): 13-20.

Cruz, N.L., and D. Giles. "Where's the community in Service-Learning Research?" *Michigan Journal of Community Service Learning 7* (2000): 28-34.

Davidson, S., S. Kerrigan and S. Agre-Kippenhan, "Assessing University-Community Outreach," *Metropolitan Universities 7* (1999): 28-34.

Driscoll, A., B. Holland, S. Gelmon and S. Kerrigan, "An Assessment Model for Service-Learning: Comprehensive case Studies of Impact on Faculty, Students, Community, and Institution," *Michigan Journal of Community Service Learning 3* (1996): 66-71.

Ferrari, J.R., and L. Worrall, "Assessments by community agencies: how "the Other Side" sees Service-Learning" *Michigan Journal of Community Service Learning 7* (2000): 35-40.

Fortino, C., "Leaders in environmental education: The cascade of influence." *Environmental Education Research 3* (1997): 1350-4622.

Gelmon, S., B. Holland, S. Seifer, A. Shinnamon and K. Connors, "Community-University partnerships for mutual learning" *Michigan Journal of Community Service Learning 5* (1998): 97-107.

Hall, R., G. Castrale, and S. Zimmerman, *Business-Education Partnerships: Developing a Collaborative Relationship with Business and Community* (Macob, IL: Western Illinois University, Illinois Institute for Rural Affairs, 1993). ERIC Document No. ED369169.

Hancock, C., A. Storey, J. Downing, and S. Szewczak, "Interagency Resource Teams: A model for collaborative approaches to environmental education," *Conservation Biology 15* (2001): 596-602.

Holstein, J.A., and J. F. Gubrium, *The Active Interview* (Qualitative Research Method Series, no. 37), (Thousand Oaks: Sage Publications, 1995).

Honnet, E., and S. J. Poulsen, "Principles of good practice for combining service and learning," *Wingspread Special Report* (Racine, WI: The Johnson Foundation, Inc., 1996). http://www.servicelearning.org/library/online_documents/good_practice.html

Kormondy, E., and P. Corcoran, *Environmental education: Academia's response* (Troy, OH: North American Association for Environmental Education, 1997).

Magill, A., "Outdoor Recreation Careers: A need for socially sensitive people and training in the social sciences," *Journal of Environmental Education 23* (1992): 4-8.

Maser, J., "Collaborative Development and Benefits of a Science Inquiry Service-Learning Course," *Metropolitan Universities: An International Forum 12* (Dec. 2001): 107-15.

Merriam, S.B., *Qualitative Research and Case Study Applications in Education. Revised and Expanded from Case Study Research in Education* (San Francisco: Jossey-Bass, 1998).

Noley, S., "Service-learning from the agency's perspective," *New Directions for Higher Education 18* (1977): 87-92.

Schmidt, A., and M. Robby, "What's the value of Service-Learning to the Community," *Michigan Journal of Community Service Learning 9* (2002): 27-33.

Trelstad, B., "Why the environment needs national service," *National Civic Review 86* (1997): 219-225.

Vernon, A., and K. Ward "Campus and Community Partnerships: Assessing Impacts & Strengthening Connections" *Michigan Journal of Community Service Learning 6* (1999): 30-36.

Ward, K., and L. Wolf-Wendel, "Community-Centered Service Learning," *American Behavioral Scientist 43* (2000): 767-780.

White, C.R., "A model for comprehensive reform in general education: Portland State University" (Report to Portland State University, 1994).

Author Information

Jody Schmidt is an environmental educator and graduate student in the Center for Science Education at Portland State University.

Julie Smith is an Assistant Professor in the Center for Science Education at Portland State University.

Jody Schmidt
4821 NE 28th Ave
Portland, OR 97211
Email: schmidtj@pdx.edu
Telephone: (503) 701-2654

Julie Smith
Portland State University
Center for Science Education
P.O. Box 751
Portland, OR 97207
Email: smithjj@pdx.edu
Telephone: (503) 725-4252