Connecting Curriculum to Community Research: Professional Services, Research, and Teaching

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Abstract

Portland State University's Community Environmental Services (CES) has helped shape the Portland metropolitan region's sustainable materials management practices for more than twenty-five years. CES's research and program development services have benefitted community partners that in turn have provided hundreds of students with rich educational experiences. PSU faculty members also advance their pedagogical and research agendas through the development of CES-affiliated capstone courses. This article explores the CES co-production model from the perspectives of students, faculty members, and community partners.

Community Environmental Services (CES) at Portland State University is a unique twenty-five-year-old university-based service unit that has helped shape the Portland metropolitan region's ethic and practice as it relates to sustainable materials management. Over that time, CES has engaged in co-production activities with dozens of community partners to provide research and program development and management services in materials management and waste reduction. This work has involved hundreds of students, both undergraduate and graduate, and supported their education in numerous ways.

One of the most important benefits of this unique organization has been the role CES plays in providing a vital programmatic infrastructure that allows numerous faculty the opportunity to engage this work within the body of their teaching and research. One of the prominent ways this work has been done was through the development of capstone courses, as well as numerous other community-based learning courses. This article will explore the factors that allowed the two frequently separated functions in universities—research and teaching—to find common ground, and the ways both research and teaching contributed to and were enriched by this mutual relationship. The article includes an examination of the foundational roots of the work of both CES and the capstone program as a model of co-production by recounting the experiences of students, faculty, and community partners who were engaged with CES and capstone partnership work.

CES History

Twenty-five years ago, two colleagues from the School of Urban and Public Affairs organized a small-scale demonstration project to engage students in developing a

community recycling initiative. This project was inspired by the then-recent attempts of the City of Portland to begin a city-wide recycling collection program involving all single-family residences in the city. It was curious to us at the time that nearly half of the city's residents, namely those living in multi-family residences, were not included in the "city-wide" program. Inquiring into the reason for this, we were informed by city officials that trying to involve tenants who live in apartment complexes was too "risky" because of fear that their lack of interest and participation in recycling would compromise the program's effectiveness. This appeared at best an oversight of the potential gains in recycling that could be accomplished by the substantial population living in multi-family residences and at worst a blatant discriminatory bias embedded in city policies and the practices of city planners.

To raise the issue, we decided to test how multi-family residents would engage in a recycling program if given the support and a chance to participate. The faculty colleagues and students from a class examining urban environmental practices organized the first student-led recycling project at one of the Housing Authority of Portland's low-income, multi-family apartment complexes. The high volume of appropriately prepared materials from the initial pilot effort not only proved to the city that recycling efforts in multi-family complexes can be successful, but also that these residents and residential complexes were actually a strong community asset in helping the city reach its environmental goals. The City of Portland then expanded the "city-wide" program to include *all* residents, regardless of the classification of their residence, largely as a result of that pilot demonstration project. The city also decided to engage the services of PSU students in those expanded efforts as a result of the quality of the work done in the pilot project. In so doing, the City of Portland became the first city in the nation to have a city-wide multi-family recycling program. These actions were clearly instrumental in vaulting Portland into the role of national leader in municipal waste reduction and recovery, a position that continues to this day.

We were not aware that in that initial project we were modeling an initiative that has now, over twenty-five years later, become an organization that would engage hundreds of students in scores of long-term projects with countless public, nonprofit, and private entities as partners to reduce waste and implement sustainable practices. What is possibly most notable is how the groundwork that was laid twenty-five years ago became the foundation for on-going, transformative, student-centered research experiences. Nowhere is this more evident than in the contribution that CES has made to the university's capstone program.

Institutional Context

CES's efforts to build a programmatic unit for student engagement with community partners fit into a larger institutional context. Community-based learning and a broader focus on civic engagement fit well within an institutional transformation that began in the early 1990s. An historic agenda of comprehensive reform was set forth at PSU to align general education, curriculum, undergraduate and graduate academic programs, scholarship, and research with community outreach and partnership development.

PSU's location downtown enhances its possibilities to be in and of the city and the metropolitan region.

A major component of this institutional transformation is grounded in University Studies, PSU's general education program, which emerged as a model for integration of student learning with service in the community. In the University Studies program four primary goals are explicitly integrated into the curriculum during the undergraduate experience: inquiry and critical thinking, communication, appreciation of the diversity of the human experience, and social and ethical responsibility. In their final undergraduate year, PSU students take a six-credit senior capstone designed to integrate the four goals. A capstone that stemmed from the partnership work initiated by CES was among the first five capstone courses piloted in 1995. (For more details on the capstone program see "Sustaining Change: Successes, Challenges, and Lessons Learned from Twenty Years of Empowering Students through Community-Based Learning Capstones" elsewhere in this issue.)

Over the past two decades, the number of capstones has grown, including many courses that have been developed from the partnership and program infrastructure built by CES. CES provides empirical evidence in direct support of the claim that well-conceived and executed community-university partnerships are actionable examples of how one can both teach about and bring to life an active social sustainability agenda. Also, university partnerships in the community can provide a solid base and multiple opportunities to shape research and teaching. In the next section, we discuss in more detail the program structure of CES and how it has created a valuable infrastructure through which numerous capstones as well as other community-based learning courses have materialized.

CES Organization and Structure

The mission statement for CES states that "CES provides community partners in Portland, the region, and beyond with research data and technical assistance on urban environmental issues and resource sustainability, while giving PSU students the opportunity to develop leadership capacity and practical job skills through education, service, and research." CES is a student-centered organization founded on the belief that students not only have passion and energy, but also that they have abilities. When these attributes are supported and applied to work in the community that addresses important matters of public interest, students are prepared to become future change agents as well as change agents of today.

As a research institute, CES provides high quality research and technical expertise to local community partners through contracts and intergovernmental agreements. CES operates similarly to a consulting firm, simultaneously managing multiple contracts with unique timelines and budgets. At the same time, CES is distinctive among consulting firms and many other university research centers because the mission and structure of CES is centered on student development. Students not only provide CES services to local communities, they also are given opportunities and support to shape

their educational programs around the work they perform. Teaching and non-teaching faculty members, as well as graduate research assistants with advanced CES experience, provide support for students in both their education and CES work. The organization fluctuates in the number of students working at CES depending on the amount of contracted work. At any given time there are between twenty and thirty undergraduate and graduate student employees who earn an hourly wage, along with a half dozen graduate research assistants supported with monthly stipends and tuition remissions.

Support staff positions are ideal starting points for students, providing them with industry-specific knowledge and experiences that they can build upon. Support staff work on a variety of CES projects, typically during the "boots-on-the-ground" phase. Typically this direct data collection could include conducting waste stream observations, hand sorting garbage, and collecting material weight data. Support staff also provide educational outreach by speaking with local residents and businesses about their recycling systems and making suggestions for improvements. Training and supervision of support staff is provided by project leads comprised of graduate research assistants and CES support staff who have advanced experience.
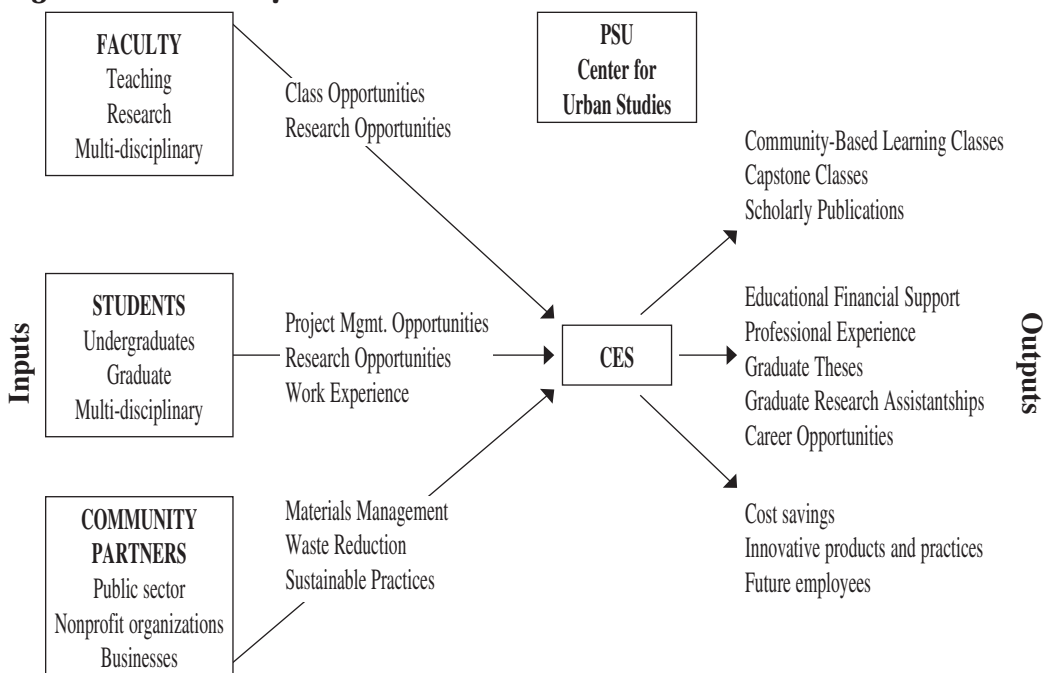
Key to CES's mission of service and student development is the opportunity for advancement and growth within the organization. As students gain knowledge and skills, CES promotes experienced support staff to the role of project leads. Lead positions have more responsibility, including supporting other student workers and taking responsibility for elements of project management. This includes providing on-going communication and project updates with community partners; staff training, scheduling, and supervising of support staff; analyzing and interpreting data; writing reports on project findings; and providing recommendations for further research or program implementation strategies. Graduate research assistant positions are similar to project leads but require students to be enrolled in a graduate program. A limited number of non-tenure track research faculty positions are supported by CES contracts to provide ongoing support for the students and overall program management.

The different types of student employee positions allows for advancement as students become more experienced. Because the scope of work varies for each project, students may work on multiple projects, in which they may be providing support on some projects and serving as a project lead on others. This approach, which offers students multiple access points for project and program skill development, as well as multiple opportunities to shape their educational and career development interests, has been one of the defining elements of CES's success. Not only has this approach been instrumental in CES's ability to provide quality services, but it has led to numerous graduates of the program being placed in senior positions in public and private sector jobs in the fields of sustainability, waste and materials management, and public and private sector program management and implementation – all directly related to the field experiences gained through their work and study at CES.

Partnerships

Over its twenty-five-year history, CES has engaged with over forty community partners, including public organization, nonprofits, and for-profit businesses (Figure 1). Many of the partners have long histories of collaborating with CES. These legacy partners have both worked with CES on multiple arenas of service and research, and provided support for student development. The City of Portland continues to be a key legacy partner. To date, CES has worked with the city in providing pilot project research and implementation of Portland's multi-faceted recycling program; extending recycling services in both residential and commercial sectors; and advancing protocols for assessing and managing the collection of a broad array of materials. The CES-City of Portland partnership over the last twenty-five years has helped to build the city's widely recognized reputation for preeminence in waste reduction innovation and success.

Figure 1: Community Environmental Services

Inputs

FACULTY
Teaching
Research
Multi-disciplinary

Class Opportunities
Research Opportunities

PSU
Center for
Urban Studies

STUDENTS
Undergraduates
Graduate
Multi-disciplinary

Project Mgmt. Opportunities
Research Opportunities
Work Experience

CES

COMMUNITY PARTNERS
Public sector
Nonprofit organizations
Businesses

Materials Management
Waste Reduction
Sustainable Practices

Outputs

Community-Based Learning Classes
Capstone Classes
Scholarly Publications

Educational Financial Support
Professional Experience
Graduate Theses
Graduate Research Assistantships
Career Opportunities

Cost savings
Innovative products and practices
Future employees

Examples:
- Over 30 capstone and other community-based learning classes with CES project partners.
- Nearly 400 students have worked in paid positions and leadership roles. Over 60 full graduate research assistantships awarded.
- Over 20 local and regional government partners; 12 nonprofit organizations and 10 private businesses utilized CES for material management, waste reduction and sustainable practices assistance. City of Portland, Port of Portland and Metro Regional Government have had partnership agreements with CES for over 20 years.

Examples:
- Community-based learning courses and Senior Capstones have completed projects within courses involving many of the community partners.
- CES has supported students in both providing stipends, tuition awards and opportunities to combine their academic programs with applied learning credit.
- Some examples of innovation with public sector include comprehensive residential, commercial and public recycling waste reduction protocol and assessment; business innovation examples include assistance in making a major grocery chain "zero waste."

Other key legacy partners include Metro (a four-county regional government body) and the Port of Portland. The CES-Metro partnership has been the basis of ambitious efforts to achieve regional waste reduction goals. The work with Metro has also led to numerous partnerships with smaller cities in the region, many of which have lasted ten or more years. The CES-Port of Portland partnership supports an innovative project that provides operational assistance and support for all Port of Portland properties, with a focus on Portland International Airport (PDX). A team of CES student employees, based at the Port of Portland headquarters at PDX, works directly with port employees to oversee, design, and implement waste and materials management programs at the airport, marine terminals, and headquarters buildings. This project provides students with opportunities to develop innovative pilot programs and initiatives while encouraging waste reduction efforts in ways that have contributed to the port's role as a leader in sustainability.

CES's partnerships are not limited to public agencies. Numerous business and commercial entities have partnered with CES over the years. These partnerships often include building and implementing comprehensive materials management and waste minimization strategies. For example, CES worked with a leading locally-owned commercial food chain to design and implement a set of management protocols and practices that would net zero waste.

CES: a Model of Co-Production

CES has been built on the fundamentals of co-production from the inception of the program to its current day operation. Co-production puts the emphasis on the contribution made by the service beneficiary in the service delivery process (Bouvaird 2007, 846). This approach has been key to CES's success in building robust and long-term relationships with community partners. The co-production approach to partnership work from public services is potentially transferable to higher education.

Higher education has always been about the development rather than the transmission of knowledge (Neary, Bell, and Stevenson 2012, 126). When students are engaged in applied learning with community partners, they are confronted with unstructured problems and are exposed to a diversity of concepts and practices. These experiences greatly increase their capacity to develop knowledge and engage in the co-production of learning. In roles students perform within CES, they are not just "consumers" of education, but their community-based work puts them in roles as "producers" as well. Examples of this increased capacity has been demonstrated in multiple CES projects in which students who had direct experience working with a community partner developed a sense of empowerment, in that not only did their work make a difference, but it also helped them acquire knowledge that could not have been gained through classroom lessons.

CES students have compelling and unique opportunities to engage and further their education while providing important services within the community. Similarly, faculty members have the opportunity to directly engage students in the co-production of learning by building a platform of experience and reflection that furthers and enriches

students' learning. Both student and faculty member capabilities and benefits are enabled through the active engagement of community partners who provide the arenas for service and support for both teaching faculty members and student learners.

In much the same manner, CES actively seeks to expand students' and faculty members' capacities to learn and teach at the same time they are engaging in the work of community partners. Thus, the student, faculty member, and community partner become co-producers of learning, teaching, and service. Each one benefits from the others' efforts, while at the same time contributing to the development of the agenda, process, and outcomes that meet the shared interests of the partnership.

Challenges Building Citizenship

Above all things, co-production is a partnership strategy. This is both its potential strength and possibly its biggest liability in considering its continued application in higher education. Partnerships between different entities hold the promise of combining resources and broadening both participation and ownership in addressing social problems, but partnerships between parties of dissimilar interest and disparate resources can be ineffective at best and even counter-productive at worst. Harry Boyte (2015) makes the observation that what we have in American society are, on the one hand, citizens who are in tune with private matters but who know little of what is needed to involve themselves with matters of public consequence and, on the other hand, a public sector which for the most part is preoccupied with purveying goods to citizen "clients" while remaining out of touch with their own citizenship and citizen-building processes (Boyte 2015, 8). Thus it follows that partnerships comprised of "private citizens" and "public servants" who are coming from such fundamentally different interests and perspectives are ill-situated to meaningfully address matters of public interest.

CES provides programmatic infrastructure that seeks to empower student learners by providing them with a structured way to be agents of social change and community betterment. As a result, students gain experience and build capacity for public citizenship. There have been countless examples of CES students taking on community improvement initiatives outside of their work at CES but building from the professional, organizational, and community engagement skills practiced through their work at CES. Both faculty members and community partners engage in citizenship building through their engagement in supporting student learners with experience and insights. Together, students, faculty members, and community partners increase their capacity to meaningfully address matters of public interest.

Curriculum Connection

From its very beginning to the current day, CES has been both a product of and a contributor to the university's curriculum. The intersection between the work that CES performs and PSU's curriculum produces an ever-expanding and deepening source of partnerships for teaching, learning, and working to produce social change. This intersection has led to many innovative curricular components that were both

conceived of and tested as parts of multiple CES projects. For example, CES and the Portland Public School District worked together to build an action-based high-school curriculum as part of a pilot for PSU's capstone program. This project modeled the power of engaged learning and demonstrated that high quality service can be delivered to high school students when supported and orchestrated within a curriculum. CES also was the organizational home for an AmeriCorps pilot program in which participants combined community service with their university educational programs. CES's reach has extended to multiple PSU schools and colleges including business, education, environmental sciences, fine arts, and urban planning. Although the curricular content of these programs is shaped by their individual disciplines, these initiatives all share a common focus of engaged action research and community partner participation, structured and made accessible by CES's established partnerships through their contracting relationships. Thus, the organizational structure of CES provides support to faculty and students to engage their educational and research interests within a continuum of established partnerships and program work.

The curricula of various PSU colleges and schools provide rich opportunities to shape CES's work as well. Many CES community connections emerge from classwork, as well as individual students' efforts as part of completing research theses or performing internships. In 2004 a team of students began a volunteer project to attempt special events recycling with a local special events organizer responsible for a twelve thousand-participant fundraising walk. This initial work inspired the development of a long-term contracted program between CES and the City of Portland to expand recycling to all special events held in the city. CES maintains a network of communications that made it possible to mine this and many other curricular collaborations for continuing inquiry and partnership development by actively engaging with faculty and students across the campus.

Throughout CES history, community partners who have contracted with CES for service have also benefitted from courses and research supported by CES. While benefits accrue to community partners from the extra services provided through curricular connections, partners also frequently benefit from the process of working with students and faculty members to help integrate important work and partners' issues into the curriculum. As community partners engage in the teaching and research being conducted, they expand and deepen their own capacities to address their important issues while developing new and innovative ways to conduct their work.

Another key element that enhances curriculum provided by the CES infrastructure is the opportunity provided for CES student staff and project leads to gain experience with teaching and research through the curricular connections. Not only do the faculty members and students in community-based learning classes benefit from having access to CES's program and partner infrastructure, but also students who are working at CES gain rich experience in mentoring and teaching. Frequently staff at CES are given roles as teaching assistants in a class and take on major responsibilities for assisting faculty members and students to connect their coursework to the work of CES and the community partner. These experiences can be important additions to students' resumes.

Recently, one CES project lead was able to lace together her experience at CES with her teaching assistantship in a capstone, allowing her master's thesis to reflect these experiences and showcase her impressive array of qualifications. This led to her being hired for a managerial position with one of CES's legacy partners, largely because of her set of unique qualifications. This is only one example of many similar stories from dozens of CES alumni who have been placed in key industry and public sector positions.

Throughout CES's twenty-five-year history, a rich exchange of both services and benefits have existed between CES and multiple dimensions of the PSU curricula. In this exchange, we see a continuum of co-production involving faculty members, students, and community partners, in which beneficiaries of service have active participatory roles in the delivery of the service. CES infrastructure serves as the essential hub of intersections between the production of education and service within the curriculum and within the community (Figure 2). The next section will take a more in-depth look at one of those curricular intersections with CES, the University Studies capstone, examining CES's capstone-related courses as recounted by student, faculty members, and community partner participants.

Figure 2: CES Curriculum and Research Examples

CES-assisted Capstones Course Projects (partial list):
- Design and implementation of a compost program at the Oregon Zoo, run by Metro regional government
- Assessment of waste stream materials and design of re-use processes for major shopping mall
- Sponsorship of re-use and material swap fair with neighborhood association
- Development of field-based recycling education curriculum for a school district
- Assessment markets and business opportunities for waste stream material recovery
- Assessment of opportunities for recycling of greywater in university housing facilities
- Design and installation of demonstration compost systems at community garden locations

CES-assisted Projects with Community-Based Learning Courses (partial list)
- Survey of public participation rates in curbside recycling
- Exploration around homelessness and public recycling
- Conducting of numerous surveys of waste stream audits at public facilities and multi-family residences
- Marketing

Graduate Theses and Dissertations (partial list)
- Developing Key Sustainability Competencies through Real-World Learning Experiences: Evaluating CES
- Sustainable Operations at Portland State University: Relevant Organizational Issues and a Path Forward
- Portland's Multifamily Recycling Program: A Study of Co-Production Policy and Citizen Involvement

CES and Capstones

Capstones occupy an important and foundational place in the general education program at PSU. Capstones provide students with a curricular structure that positions them as participants in performing important community work, but also aims to help students acquire essential skills for being active citizens and meaningful members of society. Capstones also provide faculty members with in-load courses that allow them to embed their teaching and research within community contexts. The key to the capstone structure is the community partner. Capstones are built around the work and goals of engaged community partners and, as such, offer community partners ways to broaden their organizational resource base, allowing them to address the important challenges they face. This section will explore ways that students, faculty members, and community partners have benefitted from the opportunities that capstones provide, as well as how they have addressed challenges experienced in the unique and symbiotic relationship enjoyed by CES and capstones.

The Student Experience

Capstones are, by design, community-based. As such, the discourse as well as the outcomes for learning transcends the disciplines of the academy. In this learning environment there are shared consequences between the students and the communities in which they work. This is reinforced with partnership agreements in which both community partner and the students assume responsibility and are accountable for work performed within the capstone. This level of accountability for work performed outside of the classroom and within the community presents additional challenges and can be daunting. The degree to which students are supported to meet these challenges within the classroom and within the community greatly determines both the learning and the outcomes that are experienced in the capstone. In this regard, the community partner's role becomes essential to a successful capstone experience. This role is not just defined in terms of being a service recipient, but also in terms of providing support to the students' experiences.

In addition to the community partner, there are other avenues of support available to the capstone student. For capstones that work with a CES partner, CES provides a number of resources to support student work and learning. One of the most important supports is CES students and professional staff. CES staff many times work alongside capstone students as both peers and guides, as they have had previous experience working with the community partner. As one student who was engaged with a neighborhood in helping design and implement a large-scale material swap fair with commercial and residential complexes recalled, there would have been no way they would have thought at the beginning of the term that this task could be done in a short eight-week summer class. But once the diverse skills and multidisciplinary knowledge of the classmates as well as the experience of the CES student project leads working with the class were known, the student not only perceived the project to be doable but felt "empowered" by the team she was working with.

For a student to make the most of what might be very new and challenging experiential and educational terrain, faculty members and community partners must be prepared to address the challenges in order to maximize the opportunities for students to have a successful experience. CES has demonstrated a unique capacity in this regard. Because of CES's history of developing and maintaining successful community partnerships, capstone students who work with a CES project partner have access to established relationships and successful past experiences that add richness and depth to students' current work. This point is illustrated by a CES-supported capstone student who worked with students from a neighborhood school, first to conduct a waste audit and then to prepare an action plan for how the students could help the school reduce their waste. The capstone student noted that she felt like she was "part of a legacy" by coming into this class and working on this project—and *that* was an empowering experience. It made her feel like the work she was doing really did matter and had importance because of the project's history. In addition, the continuity of this work and the breadth of experience of CES not only made the project doable but also one that would make a difference. The capstone experience put this student on a pathway that led her to take a position in CES after completing the capstone, where she will continue this work and become a peer mentor to other students in community-based learning courses.

CES helps students both to further their education as well as to prepare for future employment by providing those who complete CES-affiliated capstones with opportunities to continue working on the issues their capstones addressed. Both the student's capstone experiences and the opportunities to continue this work in CES can be life-changing. As a student who participated in a pilot capstone partnering CES with a local high schools recalled:

> The small and personal structure of the class, the challenges of engaging with other learners in the class and students with the community partner, the introduction to reflective learning around applied practice, all made possible by the faculty working with CES and the community partners in the capstone, set me on an altered course for my own education and ultimately my career (A. Spring, personal communication).

This student chose to continue to work at CES following the capstone class. She acknowledges that her time at CES helped her develop the advanced research skills and tools of community-based learning and engagement that led to her acceptance to and completion of graduate school and, ultimately, to her present position within PSU. She credits these formative CES and capstone experiences for a now nearly twenty-year career in which she continues to create applied experiences, similar to those she had, for current students.

The real-world-based methods of inquiry typically employed in CES-affiliated capstones are also important in enhancing students' educational experiences. Much of the work that students do in these capstones involves documenting what is in the waste stream and exploring ways that the amount of generated waste can be reduced. Many

times this work is tedious and unpleasant, but, in almost all cases, also very revealing and a source of curiosity and creativity. As one student who completed a CES-affiliated capstone project that partnered with a large multi-family residence, stated, "I never knew you could learn so much from a dumpster full of garbage" (L. Bruschi, personal communication). This capstone student said that she appreciated this opportunity even further after she heard that CES student-workers routinely did this same work. Capstone students come to realize that what can be learned in investigating the waste stream provides them with opportunities for creative problem-solving. This points to two very important attributes of CES-partnered capstones: first, waste stream reduction efforts are replete with learning opportunities, and second, efforts to reduce waste streams can be readily and easily measured. The omnipresent and tactile nature of the materials people use and turn into waste are important data sources that serve as a very strong reminder to students that much of what we can learn about our world and ways to improve it can come from everyday observations of the most common sort.

The Faculty Member Experience

One of the greatest challenges faculty members face in designing and offering capstone courses is locating a suitable community partner. From a faculty member perspective, requisite qualities that community partners must bring to any capstone are a willingness and capacity to support the work students will be performing, as well as the education in which they will be engaging. Since CES has an on-going roster of projects with community partners that have already been built around student staff, working with CES turns out to be an enormous asset for faculty members. An experienced faculty member, who developed a capstone course that engaged students in building a network of potential local manufacturers that could re-purpose materials recovered from a large commercial shopping center's waste stream, noted that working with CES projects and partners allowed her the opportunity to not have to work from scratch on building a relationship with a community partner but to focus on aligning the community work the students would be doing with her course (C. North, personal communication).

Faculty members discover that teaching a capstone involves taking on a number of supervisory and project management functions of community work and aligning these with the learning objectives of the course, in addition to the traditional faculty member expectations of organizing and delivering course material and assessing learning objectives. These varied responsibilities can seem overwhelming, not only with regard to the time required but also in terms of the on-the-ground knowledge to support students in their learning and to assure that sufficient time and resources are available to monitor students' community work and provide "quality control." Faculty members who work with CES on their capstones have access to a roster of community partners, all of which have past experience working with students. This provides an important resource to faculty members both in terms of initially offering a capstone and for aligning future courses that can take advantage of the continuity of work that CES provides. In almost all CES-affiliated capstones, faculty members also have access to an array of CES student support staff and project leads who are available to assist in project organization and management. A faculty member who offered a capstone on

developing a branding and marketing campaign for a large waste reduction initiative being launched by a neighborhood association acknowledged the value of these assets. She noted that working with CES student staff was like having a ready-made support system to help with the more managerial parts of the project. The faculty member was able then to put more time and energy into assuring that the learning goals were being addressed in the course.

Faculty members can also access new content elements to build their own teaching and research by working with CES in the design of their capstone courses. A non-tenure-track faculty member who co-produced, with the Portland Public School District, a capstone involving a recycling curriculum linking college, high school, and local elementary school students, discovered that partnering with CES not only provided course delivery support but also created opportunities to further a new research agenda on the positive effects of mentoring on student success. The success of the initial capstone led to it being replicated at multiple Portland area high schools. Partnering with CES opened an entire field of inquiry on the positive effects of mentoring for this faculty member that not only led to the completion of his doctoral dissertation but also to his promotion to a tenured position in his department. The capstone-based introduction to the positive effects of mentoring continued to contribute to his research and teaching over his entire career at PSU. This faculty member emphasized that the importance of the role the community partner and the students themselves had in opening this pathway "cannot be overstated." He attributes the collaborative way in which students and partners worked, and the diversity of the experiences and capacities each brought to the capstone, as key elements that drew him to this new area of inquiry that ultimately transformed his whole body of scholarship and teaching.

This pathway of research and teaching is not uncommon with faculty who have engaged with CES in teaching a capstone. This approach has been instrumental in furthering faculty members' scholarship and teaching, as well as ultimately leading to advancement in fields as diverse as psychology, fine arts, and urban planning.

The Community Partner Experience

As has been repeatedly emphasized in this issue, community partners are essential and foundational to successful capstones. But the role community partners play in capstones is unique. Unlike a typical client/consultant relationship, students are not presented to the community partner as the experts but rather as learners. In no way should this unique quality of capstones be taken as a lowering of expectations or under-valuing of the high quality work performance that students can and regularly do produce. Students are critical in the process of adding value to what would otherwise be realized in a more traditional client/consultant relationship.

Community partners in capstones benefit in unexpected ways from this unique relationship with students and faculty members. Partners frequently discover the advantages of not being limited to the role of "client" or consumer of service, but rather having opportunities to participate within the educational process – as both

teachers and learners themselves. The manager of the department overseeing Portland's city-wide recycling program explained the value derived from these non-traditional roles. He stated that "one of the most gratifying parts of the partnership with a capstone was working with students as learners." By interacting with the students about the work the city was doing, he was given new opportunities to learn about ways to perceive and address the challenges he faced in his work. He noted,

> I had no idea how much more I could learn about the very work I manage with the city until I [was given the occasion], within the many capstones that we have partnered with CES, to share my work with the students in a class. The diversity of the students' backgrounds and interests, as well as their passion for wanting to make a difference, not only provided fresh new perspectives on how to approach my work but also re-energized me in my work (B. Walker, personal communication).

Another of the CES partners who manages a large business district's sustainability programs reports a similar experience. She recalls that her experiences in implementing a CES-affiliated capstone, especially going through the process of finding appropriate work for the students to complete to help with the problem their organization was addressing, made her realize "just how many different ways one can perceive of the work we are doing and the many different avenues that can be followed in achieving the results we hope for in that work." For these community partners, stepping out of a more traditional role of a "client" seeking "consultant" services into a multi-faceted role that involves being an active participant in the learning process itself, had many additional values that went beyond the services that students provided in the project. As one community partner remarked, referring to the experience of working with CES and capstones, "It's like getting two for one. [When you contract with CES] you get an added bonus of work and knowledge [from] students and faculty…" (S. Heinicke, personal communication).

It may seem like a tall order for the community partner to be a participant in a learning process while also working to manage projects they are responsible for in their jobs. Although students in a capstone do not represent a trained workforce ready-made to engage in the challenging and important work the partner performs in the community, this does not mean their work will be somehow less valuable or that the community partner will be forced to lower its standards. For capstones to be able to sustain relationships with community partners, there must be quality products that provide a return on partners' investments. CES supports both capstone students and the community partners in ways that provide partners with a return of very valuable work done by students, and students with value-added experiences that are powerful aspects of their learning. In addition, by having a community partner with a past history of working with CES, faculty members and students have the benefit of engaging with a community partner who has experience in working with capstone classes and already sees the value in student-centered work partnerships. A CES-facilitated partnership considerably raises the chances of both a successful learning experience and a successful body of work being completed within any given capstone. As one community partner

recalls, "There was a seamless transition for [us] in partnering with a capstone class due to [our] previous experience with CES" (E. Hormann, personal communication).

Lessons from Students, Faculty and Community Partners

There are several common themes that emerge in the wide array of diverse experiences recounted by students, faculty, and community partners that have worked with CES-affiliated capstones. These experiences provide insights that can help guide a larger understanding of the value of community-based learning and inform those who wish to build a curricular connection to a student research institute or some organization with the hallmarks of CES.

Co-produced service learning. Some of the most valuable and productive experiences for those engaged in CES-affiliated capstones come from situations where participants share in the work and even the exchange of roles in the production of the educational and service experience. The structure of the capstone class, especially when the course partners with an established consulting and contracting service organization like CES, extends valuable opportunities to all parties within the partnership to participate in the delivery of both education and service. Students, at the time they are learning CES-provided content in their capstone courses, are also getting to share this information with the community. Faculty members have the opportunity to enact both their teacher and service provider role. Community partners actively participate in the teaching and learning process while still receiving valuable service as the result of students' capstone class projects. The opportunity to share in the processes as well as the benefits of work and learning can become powerful, even transforming, experiences.

Longevity and continuity in service and education. The established network of CES-affiliated community partners and projects provides an invaluable reservoir of opportunities for community-based educational experiences like capstones. Faculty members and students who engage in community-based courses, in most cases, do not have either the community networks or the time to develop the relationships with community partners necessary for these courses to be successful. CES provides access to a network of service providers and allows the work that students engage in to be part of larger and longer term community efforts. The durability of CES partnerships and the ongoing nature of CES projects provide students and faculty members with opportunities for the continuity of the work and access to partners that otherwise would not be available to them.

Connection of research centers and the curriculum. As has been demonstrated in the experiences of those that have participated in the CES-partnered capstones, the body of work that is done within CES as a research center is an enormous asset in the delivery of the curriculum, especially the curriculum built around community-based learning. Frequently in institutions of higher education, research capacity in universities' centers and institutes are removed, physically and functionally, from the

departments and schools delivering the curriculum. Such a separation is a huge loss for both teachers and researchers. CES and CES-affiliated capstones have demonstrated that more actively engaging the activity of teaching and research centers together can clearly be a win-win situation for both.

The community "textbook." The range of experiences within the community that are opened by capstones exposes an enormous array of potential learning opportunities. CES projects that investigate and track materials in the waste stream provide learners with access to a very tangible and "material" body of knowledge about how our society functions. In essence, the waste stream writes daily texts that reveal the business of living in the cities on our planet. This text for learning is tactile and observable and can be accessed through the simple act of opening the lid of a dumpster and examining the contents. In addition, the results of efforts to change the amount in the waste stream are similarly accessible. The knowledge to be gained from these physical artifacts of our waste and our society do more than teach us about the subjects that frequently are the focus of the CES-affiliated capstone classes; they represent a rich opportunity to expand our knowledge and to improve our humanity by opening our eyes and accessing the knowledge that the many "textbooks," like the dumpsters, in our communities can potentially give us.

This last point was strongly reinforced to a group of students in a CES-affiliated capstone who were working to assess and document tenant participation in a new CES-installed recycling system at a multi-family residence. In sharing the results of the study with the manager, the students were surprised that the manager was not pleased with evidence that showed that tenants were correctly using the recycling facilities at the complex. Rather, he was upset by the number of empty cat food containers the students identified in the recycling bins because the tenants were not supposed to have pets. Upon further inquiry into the matter, the students discovered that the tenants did not have pets but were buying cat food for their own use. This, as they discovered, was because the tenants were largely non-English speaking and bought the cheaper food with the picture of a fish on the label, unaware that it was pet food. When this information was shared with the manager, his indignation instantly turned to compassion and concern for their welfare. This new awareness of what the tenants must be dealing with in a world that is very foreign to them led to increased efforts on the part of the manager to better understand and appreciate his tenants' circumstances.

Continuing onto a Path Forward

Along with its many successes, CES has faced a number challenges in sustaining this robust learning and research endeavor. Efforts to support and maintain the infrastructure essential to on-going community-university partnerships can be demanding, but doing so can be richly rewarding to both the institutions of higher learning and the community. These challenges and efforts to address them as CES moves forward are discussed below.

Co-Production and Maintaining Accountability

One of the biggest challenges faced by CES is to maintain accountability by delivering quality service that meets external community partners' expectations, while also supporting student development. Since students are largely responsible for meeting the requirements of contracts with community partners, it is essential to have oversight of their work in order to assure quality control. The use of senior-level students, project leads, and faculty members in these oversight roles is a necessity. In meeting the student development goal of CES, close attention must also be paid to the level and quality of support that is provided to students in order to enable them to perform successfully. Meeting the challenge of fulfilling the two goals for high-quality work performance and student development requires close communication with community partners to assure that there is mutual understanding and joint participation. Frequently this means making adjustments and negotiating necessary revisions to work performance areas and methods so that both goals can be reached.

For example, in the beginning of a major work agreement with the City of Portland to conduct a weight study of recycling and waste containers of single-family residences, it was discovered that the original methods designed for collecting these weights were not feasible for the work if it were to be done by students because there were difficulties securing the weights of containers at the curbside in a timely way in advance of the hauler arriving to empty the containers. As a result, not all the containers that had to be weighed were weighed, leaving an incomplete database. This was unacceptable in terms of the standards the City had set. It was also frustrating to the students not to be able to complete the work in the high-quality manner they anticipated. To address this, there was a negotiation between CES and the city to find a way that the work could be done at a level of quality that met the city's standards but also in a manner that would allow the students to be successful.

This negotiation resulted in some major changes to the project, which included the following: developing a brand-new design for a portable scale that could be more easily moved from house to house, designing and developing a communication process to allow students and the hauler to more closely coordinate timing, and changing the data collection system to allow for weights and location data to be more quickly identified and entered. Each of the implemented changes was the result of student initiatives, from the engineering needed in the design of the new scale to the methodology for communication and data entry used in the study. The City of Portland provided support for these changes by adjusting the timelines for the completion of the projects and by regularly meeting with students to review the ongoing student work and recommendations for adjustments. The result was a vastly improved system that met the city's needs, as well as a set of new opportunities and experiences for student development that was supported by both CES and the city. This mutual effort not only turned a potential failure in work performance into compliance, but also produced value-added benefits of new and innovative equipment and research methods that served as opportunities for students to expand their knowledge and experience. These successful outcomes were the direct result of a true partnership initially founded on the shared interests of both parties and maintained through active participation of each

partner to assist the other in meeting their goals. Developing such partnerships with mutual understanding of the respective goals of each and identifying a process to make necessary accommodations with respect to those goals remain an on-going challenge, one that when met secures the basis for the long-term relationships and multiple benefits that frequently surpass the expectations of each partner.

Adaptive Management

Long-term community-based programming and the infrastructure needed to support this work in the university requires management that is adaptive and flexible to ever-changing community and university landscapes. Externally-funded university programs are subject to many challenges. Funding can be uncertain, and information on funding amounts and availability many times is only available on short notice. Maintaining continuity among funder, university, and partner timetables and adjusting for different workforce needs based on contract requirements that may change in size and scope because of funding are routine challenges faced when supporting university programs on external funds. These challenges become even more daunting when efforts must be made to integrate work with community partners and contractors around the academic schedule and to accommodate funding requirements for projects to meet university fiscal and programming standards.

Student Turnover

There is constant student staff turnover in an organization of this kind, largely because student tenure at the university is temporary. Established mechanisms for recruiting and training student staff, and an adaptive and flexible structure are required in order to exist within the university and to meet workforce requirements and scheduling challenges. CES representatives conduct extensive outreach by making regular class presentations to inform and recruit students to this work. It is also essential to establish and maintain relations with faculty members and student organizations in order recruit potential student workers.

Unique Faculty Member Requirements

The nature of the work requires attention to matters not frequently required of faculty members in higher education. The combination of supporting students in a work performance environment while also advancing their educational programs is demanding and frequently incongruent. Matters of program performance accountability and varying expectations of community partners and funding sponsors don't always align with what is needed to provide a learning environment. Having the ability to juggle the two roles and to find paths where there can be congruence between potentially conflicting agendas is a unique and rare quality within the academic community. Supporting faculty members in these roles necessitates a rigorous commitment and continuous support of the academic unit hosting these faculty positions.

Research Center Outreach

One of the biggest challenges universities face is to cross boundaries of research and teaching. Frequently research centers within the university operate on timelines and

technical requirements that restrict the degree to which the two functions can be mutually supportive. The experiences with CES-affiliated capstones demonstrate the potential value of finding common ground between the two distinctly different domains. Though this has been done in many cases over the last twenty-five years of CES's existence, there remains an ongoing challenge to find further ways to bring the two functions together.

Conclusion

On a sky bridge at the university, students inscribed PSU's motto: "Let Knowledge Serve the City." This symbolically captures the institutional commitment that PSU has made to be engaged with the communities of which it is a part. CES has been a robust and enduring expression of that commitment over the twenty-five years of its existence, providing a rich array of beneficial services to public and community organizations as well as business partners. As important a contribution as these services have been to the region, just as important is the method by which these services are delivered and the programmatic infrastructure which has been created to support this work. As a student-centered organization, CES structures its work around the principles of engaged learning, leadership development, and citizen participation. Faculty and community partners who share these interests work together in supporting students in co-producing results that further public interest and community betterment. Capstone courses and the curriculum of the University Studies program have provided a regular platform of opportunity, as well as a means by which students can formalize this rich learning and experiences within their educational programs. Judith Ramaley, former PSU president who presided over the general education curriculum reform and creation of University Studies, refers to community-based learning as a shared process between community and the educational institution, a process by which there are both mutual respect and "shared consequences" (Ramaley 1997, 19). This blending of participant and beneficiary in both the process and the outcomes of education is what makes these learning environments unique and of special value. The history of CES and capstones is a product of the institution's effort to build and sustain such a platform of shared experience between community and university. This has not only benefitted each partner through the shared consequences of that endeavor, but has extended the reach of those benefits far into the communities they have together touched.

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