

Pathways to Sustainability Careers: Building Capacity To Solve Complex Problems

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Abstract

Many of the central sustainability challenges facing society today—climate change, social inequality, and resource degradation, to name a few—are socially complex, politically fraught, and imperfectly understood. To be able to effectively engage in addressing such “wicked problems,” individuals need a mixture of content knowledge and soft skills that enable them to critically analyze these challenges from a systems perspective, develop creative solutions, communicate effectively, and work collaboratively with others who may not share common views. Such skill sets and abilities are also more generally valuable in navigating personal, organizational, and societal complexities. Portland State University’s (PSU) Pathways to Sustainability Careers initiative seeks to better integrate programs that provide students with the knowledge and experience they need to engage with complex problems and be competitive and effective in sustainability-related careers. While PSU already offers a number of programs relevant to this effort, these opportunities are scattered across the university; finding these opportunities and organizing them into a coherent and complementary set of experiences can be challenging. The Pathways effort is focused on more effectively knitting together existing programs and emergent initiatives from across the university in order to engage faculty and staff through a collective action approach. By doing so, this initiative endeavors to provide a more intentional, cohesive, and easily navigable set of pathways for students, which will provide them with the academic knowledge, leadership skills, and real-world experiences needed to engage with “wicked” problems, and prepare them to successfully navigate an increasingly complex world.

Introduction

Many of the central challenges facing society today are socially complex, politically fraught, and imperfectly understood; such challenges are often referred to as “wicked problems.”^{1,2} As Richard Beinecke notes in “Leadership for Wicked Problems”:

We are in the early years of a millennium that promises many challenges and many opportunities. Globally, issues of mental health and health, poverty, population, war and foreign policy, global warming and the environment, among many others, will force us to work together for cre-

ative innovation and change.... Public leadership and competent leaders will be keys to success. (p.10)¹

What are the characteristics of a competent leader, one who is prepared to engage in addressing these and other complex issues? Relevant literature related to leadership development, social entrepreneurship, and sustainability professions suggests that such leadership requires a mixture of content knowledge—which may differ depending on the particular area of focus—and a core set of soft skills, including the ability to critically analyze issues from a systems perspective, solve problems creatively, communicate effectively, and

work collaboratively with others who may not share common views.³⁻⁵ While essential for leadership roles, these kinds of soft skills and abilities are also valuable for navigating personal, organizational, and societal complexities more generally.

Complex issues such as poverty, environmental degradation, climate change, and many other social challenges are fundamentally sustainability challenges, characterized by their social, environmental, and economic complexity and multi-generational scale. Opportunities to work on these issues may not always fall under the category of a green job. Even when such jobs are broadly defined,⁶⁻¹⁰

such opportunities may encompass a variety of positions in the fields of public health, engineering, anthropology, environmental science, finance, planning, and many other career options. Having a foundation in a content area relevant to a particular field of study constitutes a critical aspect of preparation to engage in these issues; however, the need and opportunity is to ensure that students develop both disciplinary depth and other key competencies—systems thinking, collaboration, communication, and creative problem solving—by providing them in an integrated manner.

Recognizing the value of creating a more transparent and accessible mechanism for students to gain the skills required to address such challenges, Portland State University's Institute for Sustainable Solutions (ISS) launched a Pathways to Sustainability Careers initiative in 2013 to better integrate programs that provide students with the knowledge and experience they need to be competitive and effective in sustainability-related careers. While Portland State (PSU) already offers a number of programs relevant to this effort, these opportunities are scattered across the university, making it a challenge for students to find these opportunities and for faculty, staff, and administrators to organize them into a coherent and complementary set of experiences. The lack of a coordinating framework also makes it difficult to identify and address the barriers that prevent students from taking full advantage of what is available at the university, whether it be through courses, student activities, or internships, among other opportunities.

The need for such an integrated approach to developing competencies has been recognized by Wiek et al. (2011), who have proposed a research and problem-solving framework to better integrate key sustainability competencies and to provide for greater cumulative impact and coherence among them.⁴

The Pathways to Sustainability Careers (Pathways) effort seeks to more effectively knit together existing programs and emergent initiatives from across the university in order to engage all fac-

ulty and staff in related efforts through a collective action approach.⁹ The goal of this initiative is to offer a more intentional, cohesive, and easily navigable set of pathways that will better provide students with the academic knowledge, leadership skills, and real-world experiences needed to solve complex problems. In addition to making existing efforts more coherent, this initiative seeks to identify gaps that need to be filled in order to ensure that PSU provides a comprehensive set of experiences and opportunities that will prepare its students to engage in solving complex problems. Ongoing assessments of the effectiveness of individual programs within the larger Pathways initiative provide opportunities for adaptation, increased coordination, continuous improvement, and the gleaning of lessons learned to inform efforts at other institutions.

This article discusses the need for education that can prepare graduates to engage in complex social problems, describes the evolution of the Pathways initiative, and offers observations on the emergent strategies and lessons learned regarding how to effectively engage faculty, staff, students, and community partners in such a coordinated, campus-wide effort. The article does not examine in detail the current job market for green jobs; the premise of PSU's approach is that solving complex social issues extends beyond specific jobs and career opportunities that may have an explicitly green label. Furthermore, while the Pathways initiative focuses on knowledge and skill sets that have been identified as important for sustainability-related careers, the types of experiences and competencies that are core elements of the program—collaborative problem solving, project-based learning, systems thinking, and effective communication across diverse perspectives—are applicable to other fields and career trajectories.¹⁰

Background

The efficacy and value of a college education in preparing graduates to be successful in their careers has come under increasing scrutiny in recent years, as the cost of education and the cost burden on students have soared and eco-

nomics challenges have made the job market increasingly competitive. The urgency and scale of the environmental, social, and economic challenges facing society today and the importance of providing students with the knowledge and skills to come up with sustainable solutions provides an additional imperative to develop educational programs that effectively prepare graduates to be competent agents of change in an increasingly complex world.

In a report for the International Society of Sustainability Professionals, Willard et al. (2010), describe sustainability practice as

a collaborative activity that assesses, plans, implements, coordinates, monitors, and evaluates the options and services required to collectively meet an individual's, group's, or community's socioeconomic and environmental well-being needs, using communication and available resources to promote quality, cost-effective, limited resource sensitive outcomes.⁵

Willard et al. go on to describe some of the core competencies needed in this field, stating that

work in the realm of sustainable development requires complex experience and understanding of multiple concepts and theories as well as an ability to improvise, adapt, innovate, and dream up still more visionary-yet-feasible ideas about how to transform a global civilization or rescue ecosystems in trouble. (p. 2)⁵

In assessing the most important competencies for sustainability professionals, the report found that

more "soft" skills were deemed of extremely high importance than "hard" skills. Among the soft skills examined, those considered most critical were communication with internal and external stakeholders, problem solving, and inspiring and motivating others. ... "soft" skills will continue to be needed in the future because they are necessary for bringing about transformational change. (p. 2)⁵

Not only are these competencies critical skills for those engaged in addressing complex sustainability challenges,

these skill sets are broadly applicable to other areas.¹⁰ In a recent article entitled “Success after College: What Students, Parents and Educators Need to Know and Do,” Debra Humphreys explores what employers seek from graduates and what higher education can provide to prepare students for success. Humphreys found that most employers agreed that “a job candidate’s demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than their undergraduate major.”¹¹

Active Learning Is Essential

What kinds of learning experiences are most effective in helping students translate content knowledge to success in their jobs and careers? Humphreys identifies the importance of active, project-based learning activities that provide students with opportunities to “apply their learning in hands-on settings, on or off campus” in preparing students for careers.¹¹ She also notes that “employers have for years urged students to complete internships while they are in college,” and many business and non-profit leaders continue to endorse that practice.¹¹

Importantly, Humphreys notes that

(i)t won’t be enough...to revisit curricular maps or to continue to expand faculty development efforts in order to incorporate more active learning experiences. Educators have to take two additional steps. First, these experiences need to be integrated into a coherent whole for each and every student. And this integration needs to occur as a result of enhanced collaboration among faculty across departments as well as closer collaboration between faculty and student affairs professionals—including academic advisors, career counselors, and other campus educators who work every day to help students make sense of their educational experiences. Second, opportunities for students to demonstrate what they are learning must be embedded within the educational program, along with opportunities for students to present themselves as well-educated people with a wide array of skills and with practice

in putting those skills to practical use. This cannot be the sole responsibility of career counselors, and it cannot be left until the student’s last semester.¹¹

Kuh et al. (2013) echo this message, stating that educators increasingly understand the need to move toward new “curricular pathways that provide multiple, scaffolded encounters with high impact practices for all students.”¹²

These quotes speak to the central value proposition of PSU’s efforts to create a more cohesive and navigable set of programs to prepare students for sustainability careers, and more generally for success in life. While PSU has a long-standing commitment to community-based learning and already has a number of programs that provide students with learning and experiences that provide some of the skills and competencies already noted,^{13,14} simply offering curricular and cocurricular options will not ensure that students experience the full richness that a well-coordinated, multifaceted program can offer. Institutions of higher education need to rethink how to help students navigate their educational experience to ensure they can take full advantage of relevant learning experiences. They also may need to redefine and broaden which faculty positions have a role in career counseling.

Context for PSU’s Pathways Program

PSU has endorsed sustainability as an institutional priority and has embraced the role of the university in helping better understand and address complex social, environmental, and economic challenges through its educational programs, research efforts, and community partnerships. PSU has been investing actively in academic and operational sustainability programs since the early 2000s when the first coordinators for facilities and for academic sustainability programs were appointed. In 2006, PSU established the Center for Sustainable Processes and Practices (since renamed the Institute for Sustainable Solutions–ISS) to serve as a coordinating and catalytic hub to support interdisciplinary teaching and research and

to foster community engagement. In 2008, the James F. and Marion L. Miller Foundation awarded a ten-year, \$25 million challenge gift to PSU’s sustainability programs to grow the capacity of the university to serve the community. These resources, which are administered through ISS, have enabled PSU to develop a range of programs to enhance opportunities for students to learn about sustainability, build capacity to do interdisciplinary research in targeted areas, and collaborate with community partners.

ISS supports a number of curricular, cocurricular, and post-graduate programs that provide students with opportunities to engage in active learning focused on sustainability-related issues. These include the Sustainability Leadership Center, which supports student volunteers programs and development leadership activities, a Solutions Generator program that funds projects identified by students, funded internships, a Post-Graduate Fellows program, and a graduate certificate in sustainability. The structure of the graduate certificate, which is designed to be easily combined with graduate-level degree programs, reflects PSU’s approach to combining disciplinary depth and content knowledge with an understanding of systems thinking, the social, environmental, and economic dynamics of sustainability, and community-based projects.

Other programs across campus also provide students with experience relevant to sustainability careers, including the student-staffed Community Environmental Services program that provides contracted services to local governments and businesses on recycling and waste minimization. In addition, many of PSU’s general education programs, including the freshman and sophomore inquiry courses, upper division clusters, and senior capstones, offer project- and community-based learning opportunities with a sustainability focus. Emergent efforts relevant to preparation for sustainability careers include development of an undergraduate sustainability certificate designed to deliver specific sustainability competencies and learning outcomes and offer credit for

prior learning, the recent establishment of a social entrepreneurship certificate, and development of an interdisciplinary energy certificate.

PSU was also selected as a Changemaker Campus by Ashoka U in 2012, a designation that recognizes colleges and universities that have embedded social innovation as a core value and have built supportive environments for change-making across the entire institution.¹⁵ Going through the Changemaker Campus application process helped raise awareness across the PSU campus of the many activities that provide problem-solving experiences for students while highlighting the need and opportunity to make these experiences more visible and accessible for students.

Building Social Capital through Collective Action

Simply having programs that provide students with opportunities to develop the skills and knowledge relevant to solving complex problems is not sufficient to ensure that they garner the full benefits of these offerings. As Humphreys noted, these programs need to be integrated into a coherent whole and there needs to be increasing collaboration between all of the actors that are involved in the programs.¹¹ Fostering connections between the curricular programs where students develop disciplinary and interdisciplinary content knowledge and the curricular programs/cocurricular activities where they apply this knowledge and hone their interpersonal skills is another important element of this program. In the case of the Pathways program, the specific kinds of skill sets, learning outcomes, and competencies relevant to preparing students for sustainability-related careers or for other life experiences need to be defined and mapped against the various programs and activities being offered in order to better understand what is already in place as well as where gaps in delivering sustainability-related experiences may exist.

Given the distributed and decentralized nature of universities and the fact that the programs that need to be in-

cluded in the Pathways effort are based in multiple departments, ISS is taking a collective action approach to building this program. This approach focuses on creating a network of actors who are aligned and coordinated around the pursuit of shared goals, but who also remain focused on achieving their respective programmatic and educational goals. Successful collective action efforts incorporate a number of key strategies: developing a common agenda, having a shared measurement system, participating in mutually reinforcing activities, committing to continuous communication, and including the presence of a backbone supporting organization.⁹ This approach is based on the premise that having those who are working on specific programs develop a shared understanding about how these programs align toward shared goals can result in higher impact outcomes overall.

Coordinating the Effort

In its role as the hub for sustainability at PSU, ISS serves as the backbone organization for this collective action effort and is tasked with providing ongoing support for coordination and information exchange among the program partners. Because collective action initiatives such as the Pathways effort are attempting to advance innovative and integrative approaches in complex institutional environments, they depend on long-term engagement from a multitude of actors who may need to adapt their mind-sets and organizational norms to help advance a larger shared goal. In this context, a backbone organization such as ISS can help build the social capital and trust that allows for collaborative dialogue and that can foster institutional change over time.

ISS's approach to creating these more cohesive programs reflects the recognition that personal relationships and clear and ongoing communication among key players are as central to successful collaboration as is organizational structure. One of the first steps ISS is taking in implementing this collective action effort is to work with multiple units in Enrollment Management and Student Affairs, Office of Academic Affairs, and specific schools and depart-

ments, such as the Impact Entrepreneurs program in the School of Business Administration, both to clarify the competencies and experiences that PSU wants to provide and to identify and map out the initiatives and programs that provide students with different elements of skill development and career preparation related to sustainability competencies. Bringing together the players that provide students with relevant experiences and support helps build an awareness among the different programs of how they relate to each other and how the programs could collectively provide a richer experience for students. Opportunities to better connect programs and more clearly communicate these connections begin to emerge as the alignment of goals across programs and the ways different programs provide complementary educational experiences become more evident. In addition, building social capital among the individuals involved can provide the mutual reinforcement needed for collective action efforts to succeed, laying a foundation for ongoing innovation, adaptation, and improvement of the collective effort.

Because some of the programs related to the Pathways effort were not originally developed with an explicit alignment toward sustainability-related competencies and learning outcomes, identifying and agreeing upon these competencies and outcomes is an important part of the process of identifying shared goals. While the exploration of what competencies should constitute the core of the Pathways program is still underway, Table 1 provides an example of the kinds of skills or competencies each program might be evaluated against, drawing from Ashoka U,¹⁶ the International Society of Sustainability Professionals (2010),⁵ Wiek et al. (2011),⁴ and Kuh and O'Donnell (2013).¹² Once the specific competencies and attributes that PSU wants to focus on are identified and agreed upon, ISS's expanding assessment initiative can provide a framework to track the delivery of learning outcomes and competencies, serving as the basis for the shared measurement system needed to support successful collective action efforts. Information gleaned from assessment efforts

Table 1. Mapping Matrix: Identifying Program Attributes*

Attributes, learning outcomes, or competencies	Curricular Programs					Ashoka U. Changemaker Campus <i>Designation reflects commitment to education that develops interdisciplinary, entrepreneurial, and solutions-oriented skills.</i>
	Graduate Sustainability Certificate <i>(under development)</i>	Undergraduate Sustainability Certificate <i>(under development)</i>	Social Entrepreneurship Certificate	Energy Certificate <i>(under development)</i>	Selected Capstones and Courses	
Systems Thinking						
Interpersonal						
Anticipatory						
Strategic						
Normative						
Entrepreneurial/Change Agent						
Other						
Attributes, learning outcomes, or competencies	Research Related Programs		Work Experience Related Programs		Other Programs	
	Solutions Generator <i>Competitive process provides student teams with funding to implement sustainability-related projects.</i>	Sustainability Leadership Center <i>Eco-reps, sustainability leadership training</i>	Internships <i>Sustainability-related, funded internships with non-profits and government agencies</i>	Young Professionals <i>Provides recent master's program graduates with opportunities to gain work experience and build networks</i>	Community Environmental Services <i>Provides research, technical assistance, data collection and educational outreach services related to solid waste minimization, recycling, and program evaluation.</i>	
Systems Thinking						
Interpersonal						
Anticipatory						
Strategic						
Normative						
Entrepreneurial/Change Agent						
Other						

*Note: This table is for illustration only; identification of relevant attributes still underway.

will help inform discussions among program partners regarding how well the overall initiative and individual program elements are performing and how they can be adapted and improved over time.

Building on Assets, Identifying Gaps

Creating a more coordinated approach to existing programs serves as the basis for the Pathways effort; the effort is less about creating new opportunities and more about making existing opportunities function more powerfully for students. To quote Hendrix College professor Peg Falls-Corbitt, building a more cohesive high-impact program is a “matter of taking what we were already doing, but not in a systematic way, and do(ing) it with a systematic approach.” (p. 32)¹⁷ A number of existing institutional frameworks and tools at PSU can be employed to provide a more cohesive framework for students, including electronic portfolios (e-portfolios) and degree maps. Humphreys (2013) noted that e-portfolios that allow individual students to present their work and to reflect over time on their educational accomplishments are an especially promising vehicle for better integrating experiences in a way that is tailored for each student and for enhancing collaboration among faculty and student support programs.¹¹ Through PSU President Wim Wiewel’s larger ReTHINK PSU initiative, the university is rapidly expanding the use of e-portfolios across campus, and the Pathways initiative will be exploring how best to integrate with this effort as well as with the development of degree maps that enhance students’ ability to meet degree requirements.

In addition to building on existing assets in a more systematic way, there are also gaps that need to be filled and mechanisms that need to be developed to enhance students’ ability to navigate opportunities. Some new initiatives might include providing ongoing support for students to develop individualized sustainability “pathway maps” to guide their experience at PSU; hosting “connect events” that offer opportunities for students, faculty, and partners

to come together to network and share experiences; and training “pathway guides”—staff, faculty and student leaders who can work with students to help them identify the opportunities that best align with their interests and needs. Efforts such as the connect events may have the added benefit of continuing to build relationships and reinforce how the overall Pathways’ program goals benefit specific program efforts across the university. Additional conversations and consultation among the various programs will be needed to evaluate which of these or other coordinating mechanisms are best suited to serve PSU students and which have the greatest potential for integrative impact.

Finally, one lesson that ISS has learned from its work implementing campus-wide sustainability programs is that ongoing and transparent communication is essential to success. To this end, ISS has strengthened and expanded its communications team over the past year and is taking a more intentional and proactive approach to ensuring ongoing information flow about its programs. Having the communications team develop and deploy a communications strategy for both internal and external audiences will be another critical component of the Pathways program going forward.

Summary and Concluding Remarks

Effectively addressing the urgent and socially complex challenges facing society today, from climate change to social inequities to environmental degradation, requires strong content knowledge in relevant fields as well as skills in systems thinking, active and creative problem solving, collaboration, and communication. The higher education community has an important role to play in offering our students the preparation needed to engage in these issues and to be successful in an increasingly complex world.

PSU has expanded significantly the programs focused on sustainability education, research and community engagement, paving the way for ex-

panded opportunities for participating students to enrich their experience at PSU. It is clear that these programs help students prepare to engage in complex problem solving and be successful in sustainability careers, but to make the programs more easily identifiable, accessible, and cohesive requires additional proactive efforts to better coordinate and integrate across other parts of the curriculum. Simply providing programs is not the same as ensuring a robust and rich experience that translates into meaningful career preparation for students.

Given the distributed nature of these programs and the challenges of making an institution-wide initiative work in a coordinated manner, PSU is taking a “collective impact” approach to this effort, with ISS serving as the backbone organization to convene and catalyze discussions and help identify and support action toward shared goals over time. Ultimately, the Pathways effort is about helping those whose work contributes to student learning and career preparation in the sustainability field become aware of the shared goals and parallel work of others, and thereby recognize that the “whole is greater than the sum of its parts.” Building social capital, i.e., personal relationships that bridge what are often disconnected efforts, can help people intentionally work together more, see their success in the success of others, and be more successful in collaborative work over the longer term.

While the Pathways initiative is making progress, significant work remains to prioritize the focus on specific core competencies, operationalize learning outcomes, articulate and communicate shared goals, and implement the assessment and adaptive management mechanisms needed to ensure ongoing learning and program improvement over time. ISS is committed to sharing the progress and lessons learned from this effort as it develops, and we recognize that there is much to learn from others engaged in similar initiatives. We welcome any feedback or shared stories from others working to prepare students to solve the challenging problems of the 21st century.

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